LINK

Post graduate Club's Journal

2019-20

GOVERNMENT DENTAL COLLEGE & HOSPITAL, NAGPUR

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Learning and advantagement of knowledge flourishes when we are confronted with new ideas and beliefs. With this intention post graduate club was set up in 2004 under the guiding force of Dr M. V. Lele, pioneer Oral Pathologist from Govt. Dental College & Hospital, Nagpur. A quarterly news letter of the PG club under the name 'The LINK' an acronym for “lively interaction nurturing knowledge” was released in 2004 under the mentorship of Dr S. M. Ganvir. The research work and the case reports published reflected the sincere devotion of post graduates to their work. The second volume was subsequently published under the guidance of Dr R.K.Yeltiwar in 2005. But due to some reasons it was delinked till 2010. However due to constant and inspirational efforts of our Dean Dr V.K.Hazarey, the LINK was restarted with fresh breath and the third volume was released in 2011 under the guidance of Dr. S.M Ganvir.

The current volume of 2012 is fourth in this chain and is a testament to the excellent and sincere work done by postgraduates.

The cover page of 2012 volume focuses the theme of LINK - the bond between all departments is the building block of any institution.

The back reflects the innovations of various departments with hand seeking knowledge and wisdom.

The current volume highlights the research articles and case reports of various departments presented by respective postgraduates in various sessions of LINK meets during academic year 2012-2013.

This volume also figures various academic achievements of post graduates and CDE programmes and workshops organized by departments.

Dean's Quote

Dean

Dr Mangesh Phadnaik.

Govt. Dental College and Hosp.

Nagpur.

Govt. Dental College & Hospital, Nagpur is the most adored jewel in the crown of medical field from Central India. It is not just a college but is a family where the faculty, staff, students & alumni work united to foster this spirit. The Institute has a rich legacy of 52 years. This institute has produced many renowned clinicians & academicians. Throughout all these years, the Institute has maintained the tradition of excellence creating globally competitive doctors & socially responsible human beings as citizens of India. Alumni of this precious Institute are the strong pillars & strive relentlessly for the growth of the same.

Education is mighty tool to enlighten, empower individuals & thereby evolve the society in the clear and progressive direction. While the academic excellence is certainly important, co-curricular activities are also necessary for the multifaceted development of the individual.

Though reading is essential for receiving knowledge, it has been correctly said by scholars that writing helps the learners to analyse, evaluate & critically think on the particular subject. It is not enough to gain the knowledge, but one needs to translate it into action of benefit of community. The attribute of knowledge lies in the spirit of ingenious thinking, expression & analysis, In this regard, 'LINK' has played a pivotal role as a platform for postgraduate students.

I congratulate the entire team of their commendable job in bringing out this edition of "LINK' & sincerely wish that 'LINK' continues to inspire the postgraduate students in the years ahead.

Dean,

Dr Mangesh Phadnaik

Govt. Dental College,

Nagpur

From the Officer Incharge Desk

Dr Suchitra Gosavi

HOD & Professor

Dept of Oral and Maxillofacial Pathology

"Alone we are strong, But together we are stronger"

This aptly explains what LINK is all about. **LINK: L**ively **I**nteraction and **N**urturing **K**nowledge was set up in 2004 and was the brain child of Dr. M.V. Lele, Joint Director, DMER Mumbai. Since then it has bloomed, blossomed and grown and is still nurturing us.

With this note, it gives me immense pleasure to unveil before you the LINK 2019-2020 issue, an E-Magazine. This magazine is a compilation of all the cases presented by our postgraduate students right from basic sciences to innovative cases.

LINK was a very interactive and lively activity which was conducted throughout the year. In view of the COVID-19 pandemic we could not meet for the last two activities. But that did not dim our enthusiasm as the last two activities were conducted successfully by means of online portals.

My sincere thanks to ex-Dean, Dr. Sindhu Ganvir; Dean, Dr Mangesh Phadnaik, all Heads of Dept, Postgraduate teachers and Staff for their valuable inputs. I appreciate and applaud the efforts of all postgraduate students and LINK editors, Dr Riya and Dr Vaishnavi in bringing up this magazine

Good luck and blessings to all LINK members.

Thank you.

Dr. Suchitra Gosavi

HOD & Professor
Dept of Oral and Maxillofacial Pathology

From the Editors Pen

"Post-graduation is not just a degree, it moulds you into a different human being altogether"

Interdisciplinary programmes emphasize on critical thinking and creative problem solving. LINK was formulated with the same intention. Since its inception, LINK has bloomed beautifully and has served us with fruits full of knowledge and wisdom. Throughout the year, we were able to witness prodigious cases of the respective departments. It was a medium through which our GDC family could come together every month and relish on the academic feast.

With this note, we present to you the current issue of scientific publication for the year 2019-20. All the interesting cases and researches done by the postgraduate students are presented in the form of scientific articles.

We would like to extend our gratitude to our inspiring Dean Dr Mangesh Phadnaik Sir and our admirable guiding force and LINK In-Charge Dr Suchitra Gosavi Ma'am for blessing us with the opportunity of being the office bearers and editors of this current issue.

Our thanks are due towards all the Heads of Departments, Postgraduate teachers and teaching staff for their constant encouragement and guidance without which this endeavor would not be a success.

The spine of the LINK family, are the cabinet of the prudent postgraduate students who were always with us. We thank them for their support.

We will cherish each moment of this tenure for life!

Dr. Riya Jain

Dept of Oral and Maxillofacial Pathology

Dr Vaishnavi Chodankar

Dept of Periodontology

DEPT OF PROSTHODONTICS

The Timeline and Scope of Prosthetic Dentistry- A Review

By- Dr. Pronoy Mukhopadhyay

First year Post graduate student

Dept. of Prosthodontics

Definitions

The Glossary of Prosthodontic Terms (GPT-9) and the American Dental Association have defined this speciality as follows-

"Prosthodontics is the dental speciality pertaining to the diagnosis, treatment planning, rehabilitation and maintenance of oral function, comfort, appearance and health of the patients with clinical conditions associated with missing or deficient teeth and/or maxillofacial tissues by using biocompatible substitutes." (2)

The Webster dictionary had issued the following definition-

"The branch of dentistry that deals with the replacement of missing teeth and related mouth or jaw structures by artificial devices."

The Epiphany in Prosthodontic Interventions

In 1952, De Van elucidated his opinion that the role of prosthodontic therapy should be *"... the constant preservation of what remains rather than the meticulous restoration of what is missing."*The profession came to realize that the quest to restore a compromised dentition to functional and aesthetic acceptability might actually jeopardize the health of the supporting teeth. During the past quarter century, a paradigm shift occurred, and implant and other conservative treatment options have given clinicians to re-evaluate this tenet. Conservative treatment options have been actively pursued upon and studied through various longitudinal trial studies over the years. Options such as Resin-Bonded Fixed Prosthetics and Implant-supported prostheses were popularized for their conservative approach as well as their well-proven non-inferiority over the standardised treatment modalities of the era. In this perspective, castable removable prosthodontics saw an immense boom in various retentive approaches warranting no tooth support and hence preserving the available healthy structures.

A Brief Timeline of Prosthetic Dentistry

The Distant Past- An Evolution towards Modern Dentistry (7500 BC – 1900 AD)

The foundation of modern dentistry was laid in the year 1728 along with the publication of ―Le Chirurgien Dentiste by Pierre Fauchard which contained comprehensive descriptions of the construction of artificial partial dentures and full dentures. The treatise favoured the use of human teeth and positioning springs.[3]Gold shell crowns and post retained in the root canal were used by Claude Mouton in 1746.In 1774, dentures were made from porcelain by Nicolas Dubois De chateau.[3] Sir George Washington used a denture made of hippopotamus teeth and ivory.In 1825, White Dental Manufacturing Company, Philadelphia began commercial production of porcelain crowns.[4] The moulding process for vulcanite dentures was patented in 1864. During the infancy of fixed prosthodontics, William Hunter, a physician from Britain, campaigned against many practices prevailing in dentistry. Referring to fixed dental treatment he said it was a―gold traps of sepsis and ―mausoleum of gold over a mass of sepsis. This forced a change in the direction towards the conventional methods of rehabilitation; to be precise the removable partial and complete dentures.[5]Dental burs which could cut enamel and dentin smoothly and quickly, revolutionized the practice of dentistry and laid foundation to the tooth supported fixed prosthodontics. The understanding of the temporomandibular joint and occlusion was limited to devising a replica of hinge movement. James Cameron invented and improved instruments for arranging artificial teeth and to fasten the models on support which allowed opening and closing movements.[6]

The key developments in Prosthodontic rehabilitation that followed included:

1. Development of the understanding of oral function and dysfunction

2. Evolution of the techniques for replacing missing teeth and restoring those damaged by caries or trauma.

3. Introduction of new materials, such as porcelain, vulcanite.

4. Development of new technologies for tooth preparation, diagnosis and prosthesis fabrication.

5. Development of teamwork and lab communication developed the crucial relation between technician and clinician during fabrication.

The Present- A Path Towards Re-Inventions (1901 AD-present)

The increased demand for aesthetics and development of scientific knowledge and innovative technologies gave an initial push to the current scenario of developments in prosthetic rehabilitation.

<u>Removable Prosthodontics</u>

Knowledge of rehabilitation by removable partial denture was based on Bonwill's principles on bracing the teeth and soldering a plate.In1918, Fortunati introduced surveyors with a graphite analysing rod, which accurately traced survey lines of the greatest convexities of the teeth that determined placement of various prosthetic components at their respective precise locations.[5] Removable Prosthetic rehabilitation which were developed in the latter half of 20th century witnessed the replacement of metal retainers with flexible resin materials which were nylon-based and fibre-reinforced acrylic resins.[7]Currently, Osseo-integrated implant supported removable prosthesis (ISRP) is considered a more scientific and feasible treatment modality.CAD-CAM frameworks, printable

wax or resin pattern framework for casting and direct laser sintering are presently the new trends of fabrication of RPD frameworks. The removable complete denture prosthodontics took a giant leap in 1900s. Several basic principles of making impressions were introduced. Advanced impression techniques, method of border moulding and obtaining peripheral seal took place during this period. The philosophies of impression making were developed as well. Selective pressure technique developed the anatomical and physiologically ideal method of impression making as postulated by Boucher. In the latter half of 20th century, the material used for impression making had changed from crudely heated thermoplastic materials to soft putty materials.The emergence of digital CAE/CAD/CAM technology,computer designed and digitally manufactured denture is deemed possible, in two appointments. The dawn of characterized printed dentures may see light at the earliest. The fundamentals of gnathology,the concepts of centric relation, anterior guidance, occlusal vertical dimension, the intercuspal design, and the relationship of the determinants of mandibular movements to the occlusion were recorded using complex instrumentation in complete denture prosthodontics. The foundation stone of gnathology was laid in 1908 by Norman G. Bennett. In last 70 years, occlusal concepts have changed considerably. Complete denture occlusion should satisfy the dynamic inter-relationships between forces which stabilize and destabilize the denture, including freedom in centric, and the individual arrangement of denture teeth.[8] A good occlusal philosophy combined with aesthetics is of paramount importance in the patients' acceptance of complete denture prostheses.Rapid changes were seen in the materials used for fabrication of dentures; around 20 new synthetic materials were introduced. The first practical replacement to vulcanite was in 1939 by introduction of Veronite. By 1946, 95 % of dentures were fabricated by acrylic acid products since then methyl methacrylate polymer has been the undisputed material in Prosthodontics.Only the method of moulding has changed from compression to injection and now milling.

Fixed Prosthodontics

The fixed dental prosthesis rehabilitation evolved exponentially in 20th century. This branch has evolved from replacement of coronal structure of the teeth, to rehabilitation with morphologically teeth-like dental materials.William. H. Taggart in 1907 struck gold literally, by demonstrating the lost wax technique of casting, allowing dentists to make precision cast inlays.In 1926, a Canadian dentist Irwin H. Ante postulated a guide on selection of abutment teeth for support in fixed restorations.[9] It became a basic principle for fixed dentalprosthodontics for many years.Michael Buonocore in 1955 described the acid etch technique, which provided a breakthrough in adhesive techniques in dentistry.In 1962, two major breakthroughs were made by Weinstein et al. They described the formulations of feldspathic porcelain that allowed systematic control of the sintering temperature and thermal expansion coefficient.These development lead to popularization of fabrication of porcelain fuse metal crowns providing more aesthetically pleasing treatment modalities back then.Rochette in 1973, introduced the concept of bonding a metal retainer to enamel using adhesive resin.It was considered aesthetic and minimal tooth reduction was necessary. The rehabilitations were now based more on scientific and evidence-based knowledge. It also included the development of fundamentals of tooth preparation with a holistic approach.The introduction of CAD-CAM in 1983, changed the phase of fixed prosthesis. Since its introduction, it has

changed production of ceramic restorations.[10] The Machinable ceramics have stood the test of times clinically, and considered superior in terms of aesthetics and internal fit in comparison with presently available technologies of fabrication.The prism of rehabilitation of edentulism (complete or partial) changed by the

discovery of osseointegration and techniques of achieving it by Per-Ingvar Branemark. It is considered a milestone in rehabilitative techniques. Dental implants eliminate the process of altering morphology of healthy abutment tooth for providing retention. The method of prosthetic retention of final prosthesis (screw retained or cement retained) still remains an enigma. The angulated abutments and zirconia abutments are used for providing more aesthetically pleasing rehabilitation of teeth in the anterior zone.

The key developments in Prosthodontic rehabilitation that followed included:

1. Development and understanding of biomechanics of the Prosthesis in relation to the field of gnathology.

2. Evolution of branches for further understanding of the specialty

3. Introduction of advanced diagnostic aids and concept of reverse engineering in the rehabilitative approach.

4. Integration of technology for the fabrication of more aesthetic and accurate prostheses.

5. Development of patient- and practitioner-friendly techniques and procedures.

6. Scientific multi-disciplinary and evidence-based practices saw a booming rise in relevance with technological upsurge.

The Future- A Step Towards Technological Break-throughs

The future of prosthodontic rehabilitation will be driven by digitization, globalization and urbanization. The conventional technique of 5 appointment technique can be reduced to single visit; concept of —'teeth in a day' can be a reality.The process from recording impressions digitally, to planning of implant placement and superstructure fabrication may take place in a digitized environment dominated by reverse engineering concepts. Computerized fabrication of prosthesis in clinics is becoming a feasible option by use of milling and printing technologies. —'Lab in Box' seems to be a reality in near future.[11]The concept of Minimally-invasive dentistry will receive a boost by the application of Nano robotics in pre-prosthetic and implant surgeries. The assessment of a successful prosthetic rehabilitation will be measured in terms of elevation in oral health-related quality of life (OHQoL) rather than mere numerical successes.[12]

Conclusion

In the story of prosthodontic rehabilitations; it has come a long way from Hunter's concept of septic dentistry to association between tooth loss and mortality;from the wedging of tooth- form seashells and ivory into the bone, to the current techniques of replacement with root-type endosseous dental implants and even using CAD-CAM technology for milling of Zirconia using solid-sintering technologies. Prosthodontics has been at the forefront of technological innovations. It is conquering new horizons with aprecise and eloquent conjunction of art and science of dentistry with a futuristic vision

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Removable Prosthodontics: An Overview

By Dr. Baban Kudwe

First year Post graduate student

Dept of Prosthodontics

Introduction

There are three major divisions of prosthodontics: fixed prosthodontics, removable prosthodontics, and maxillofacial prosthodontics.Despite, Implantology is not consider major division of prosthodontics. Instead, implants are considered adjuncts in fixed, removable and maxillofacial therapy

Removable prosthodontics is concerned with replacing the teeth and soft tissues with a non-permanent prosthesis that can be removed. These are often known as dentures,

It can replace a full arch of teeth (complete dentures), Also, can replace a number of individual or grouped tooth spaces (partial dentures)

Removable Prosthodontics includes:

Removable complete denture

Removable partial denture

Removable complete denture:

The removable dental prosthesis that replace the entire dentition of teeth and associated structure of maxilla and mandible

Objective of complete denture

1)Restoration of aesthetics

2) Restoration of speech

3) Restoration of mastication

4) Patient satisfaction and comfort

5) Maintenance of TMJ and oral health

6)Physical, psychological wellbeing of patient

Components of complete denture

1)denture base

2) Acrylic teeth

Complete denture includes

Overdenture:

Immediate denture:

Attachment of Overdenture:

Stud Attachment

Intra radicular Attachment

Ceka Attachment

Rother Mann Attachment

Clinical steps of complete denture fabrication:

1st clinical appointment Examination & preliminary impression

2nd clinical appointment Master impression

3rd clinical appointment Maxillomandibular relation record

4th clinical appointment Try in

5th clinical appointment Denture insertion & instruction

6th, 7th clinical appointment 24 hour &1week post insertion check and adjust denture

Removable partial denture

A removable prosthesis that replaces missing teeth in a partially dentate arch, and can be removed or replaced by the patient himself.

Types

Acrylic partial denture

Cast partial denture

Interim denture:

Transitional denture**:**

Components of removable partial denture

Major connecter

Minor connecter

Direct retainer

Indirect retainer

Denture base

Acrylic teeth

Kennedy'sClassification:

Class I

Class II

Class III

Class IV

APPLEGATE'S MODIFICATION

Applegate modified the above classification based on the conditionof the abutment to include 2 or more additional groups

Class V

Class VI

Maxillofacial Prosthodontics

The art and science of anatomic, functional, or cosmeticreconstruction by means of nonliving substitutes of those regions in the maxilla, mandible, and face that are missing or defective because of surgical intervention, trauma, pathology, or developmental or congenital malformations

Maxillofacial prosthesis:

It is an artificial device used to replace missing oral and facial structure

OBJECTIVES OF MAXILLOFACIAL PROSTHETICS & REHABILITATION

- Restoration of esthetics or cosmetic appearance of the patient.
- Restoration of function.
- Protection of tissues.
- Therapeutic or healing effect.
- Psychologic therapy

ADVANTAGES

Requires little surgery or no surgery, the patient spends less time away from home and job, and the reconstruction is often more natural looking

TYPES OF MFP

- INTRA ORAL:

Maxillary Defect

- Hard Palate-
  - Surgical Obturator
  - Interim Obturator.
  - Definitive Obturator
- Soft Palate-
  - Speech Appliance
  - Meatus Obturator.
  - Palatal Lift Prosthesis

Mandibular Defect-

- Mandibular Resection Prosthesis.
- Guide Flange Prosthesis
- *Glossectomy*
- Tongue Prosthesis.
- Palatal Augmentation.

Splints/Stents-

- Surgical Splints, Bite Splints, TMJ Appliance

EXTRA ORAL: prosthesis, midfacial prosthesis,auricular prosthesis,nose prosthesis

- **COMBINATION OF INTRA & EXTRAORAL PROSTHESES:** Orbito-Maxillary Prostheses, Naso-Maxillary Prostheses.

Indication of MFP

After surgical intervention

After trauma

Congenital defect

Acquired defect

Maxillofacial prosthetics material

Impression materials

a) Elastomeric impression materials
b) Reversible hydrocolloid
c) Irreversible hydrocolloid
d) Room temperature vulcanizing silicone
e) Plaster of Paris

Modeling materials

a) Modeling clay (sculptor's clay)
b) Plaster
c) Plastolene

d) Waxes

e) Under taker's wax

Fabricating materials

a) Poly Vinyl Polymers and Copolymers

b) Poly Methyl Methacrylate

c) Polyurethane Elastomers

d) Silicone Elastomers

HTV Silicones,RTV Silicones

. Primers

5. Retaining materials

a) Medical skin adhesives

- Pastes
- Liquid emulsions
- Spray-on
- Double sided tapes

b) Implants

- Endosseous implants
- Sub periosteal implants

c) Bar clips

d) Magnets

. Primers

5. Retaining materials

6. Colorants

Artist's paint,Nylon flockings ,Oil colors,Food coloring,Ceramic pigments ,Dry earth pigments , Celluloid paints

ACRYLIC RESINS

- Acrylic resin can be successfully employed for specific types of facial defects, particularly those in which little movement occurs in the tissue bed during function (e.g.: fabrication of orbital prosthesis)

VINYL POLYMERS AND COPOLYMERS

Vinyl Polymers

- Most widely used plastics
- Copolymers of vinyl chloride-vinyl acetate (vinyls) being the most commonly used
- 5-20% vinyl acetate
- In elastomeric form exhibits superior properties than natural rubber
- Resistance to sunlight and aging

SILICONES

- Consist of chains of alternate silicon and oxygen atoms
- Range in properties from rigid plastics through elastomers to fluids
- Maintain good physical properties over a wide temperature range
- Can be cured either at room temperature or by heat.

RTV SILICON

Room temperature-vulcanizing silicone

- Composed of comparatively short chain silicone polymers which are partially end-blocked with hydroxyl groups
- Fillers are added to strengthen

- Catalyst - stannous octoate
- Gypsum molds are used in the fabrication of prostheses from RTV silicones.

HEAT-VULCANIZING SILICONES

- Involves the use of a diorganopolysiloxane, such as polydi-methyl, siloxane
- Include

  Silastic S-6508

  Silastic 382

  Silastic 399

  (Dow Corning Corporation, Midland, Michigan)

Silastic S-6508

- Similar to sticky modeling clay
- Must be vulcanized at 260°F and formed in pressure molds

  Requires much more sophisticated handling

Silastic 382

- Opaque white fluid
- Viscosity like that of thick honey
- Sets up to a rubber without the evolution of heat within a few minutes

Silastic 399

- Resembles white Vaseline
- Easily spatulated but is nonflowing
- Can be worked for several hours
- Sets up to a translucent rubber in 10 to 15 minutes

RECENTLY INTRODUCED TERPOLYMER

- Used in a twocomponents prosthesis consisting of an outer layer of "skin" made of a synthetic elastomer which covers an inner layer or foam filler made of silicone foam rubber
- For the outer layer or skin of the two-component prosthesis is a latex-dispersed synthetic elastomer:

  a terpolymer of

butyl acrylate (90%)

methyl methacrylate (7.5%)

methacrylamide (2.5%)

NEWER MATERIALS

Silicone Block copolymers:-

- Silicone block copolymers are new materials under development to improve some of the weaknesses of silicone elastomers.

Polyphosphazenes:-

- Polyphosphazenesfluoro elastomer has been developed for use as a resilient denture liner (*Novus™, Hygienic Corp.*) and has the potential to be used as a maxillofacial prosthetic material.

Management of patient for MFP

- Personal history of a patient should be obtained
- Medical and dental history also should be obtained
- Intra and external examination of a patient by a maxillofacial surgeon and prosthodontics should be done
    - MacCrackens removable prosthodontics A.B Carr David T Brown 12 edition
    - Complete denture prosthodontics by Heartwell C.M.
- Patients risk assessment should be done.
- A surgeon should consulate with a dentist about a surgery so that there should be a teamwork.
- All surgical alterations should be demonstrated for a dentist on a cast and obturator should be made for a day of a surgery.

References

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FIXED PARTIAL PROSTHESIS

By- Dr. Romal Shende
First year Postgraduate student
Department of Prosthodontics

INTRODUCTION

In today's world missing teeth or loss of function due to missing is one of the major reasons to visit a dentist. Fare number of the patient want the replacement of the teeth with an artificial teeth to enhance their function and esthetics, that's why prosthodontics plays an crucial role in the fulfilling demands of patients

"Prosthodontics is the dental specialty pertaining to the diagnosis,treatment planning, rehabilitation and maintenance of theoral function, comfort, appearance

and health of patients with clinicalconditions associated with missing or deficient teeth and/or maxillofacial tissues using biocompatible substitutes".
-American Dental Association

Prosthodontics has 4 main branches:
1. Removable Prosthodontics
2. Fixed Prosthodontics
3. Maxillofacial Prosthodontics
4. Implant Prosthodontics

- **FixedProsthodontics :-**

Desire of the more esthetics and natural looking prosthesis with functional efficacy drives patient toward fixed prosthodontics or and implant prosthodontics.

"Fixed prosthodontics pertains to the restoration or replacement of teeth with artificial substitutes that are attached to natural teeth, roots or implants and that are not readily removable".-GPT

INDICATIONS OF FIXED PROSTHESIS[1].

- One or two adjacent teeth are missing in the same arch orshort span edentulous arches.
- The supportive tissues are healthy.
- Suitable abutment teeth are present.
- The patient is in good health and wants to have the prosthesisplaced.
- The patient has the skills and motivation to maintain goodoral hygiene.
- Patient's preference

Contraindications for a Fixed Prosthesis[1]

- Necessary supportive tissues are diseased or missing.
- Suitable abutment teeth are not present.
- The patient is in poor health.
- The patient is not motivated to have the prosthesis placed.
- The patient has poor oral hygiene habits.
- The patient cannot afford the treatment.

- The most common treatment associated with fixed prosthodontics is crown and bridges, facial veneers, inlay and onlays

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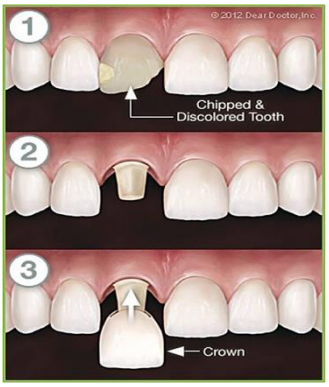
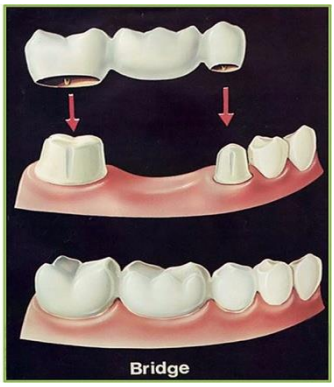




- Full veneer crown.
- Partial veneer crown.
- Three quarter crowns
- Reverse three-quarter crowns
- Seven-eight crowns
- Inlay
- Onlay

Full veneer crown[2]

It is a cemented extracoronal restoration that covers or veneers the outer surface of the clinical crown.
Primary function is to protect the underlying tooth structure & restore the function, form and esthetics.

Partial Veneer Crown

INLAY[3]

A fixed intracoronal restoration; a dentalrestoration made outside of a tooth to correspond to the form ofthe prepared cavity, which is then luted into the tooth.

ONLAY[3]

A restoration that restores one or more cusps andadjoining occlusal surfaces or the entire occlusal surface and is retainedby mechanical or adhesive mean.

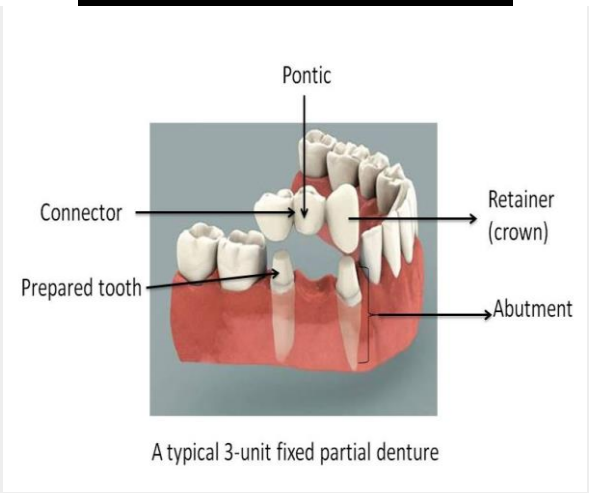
Laminate Veneers/Facial Veneers[4]

- It consists of a thin layer of dental porcelainor cast ceramic that is bonded to the facialsurfaces of the tooth with an appropriateresin.

- It is used in situations requiring an

improved cosmetic appearance on the anterior tooth.

Component of fixed partial denture[5]



A typical 3-unit fixed partial denture

PONTICS

An artificial tooth on a fixed dental prosthesis that replaces a missing natural tooth, restores its function, and usually fills the space previously occupied by the clinical crown.

ABUTMENT

A tooth, a portion of a tooth, or that portion of a dental implant that serves to support and/or retain a prosthesis

CONNECTORS

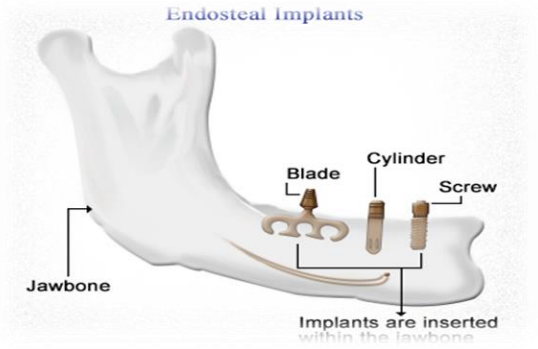
Fixed dental prosthodontics, the portion of a fixed dental prosthesis that unites the retainer(s) and pontics.

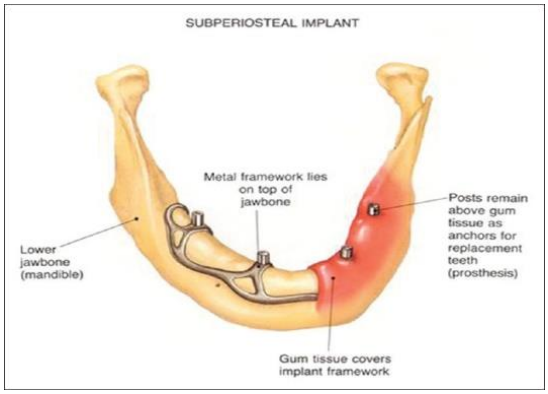
DENTAL IMPLANTS[6]

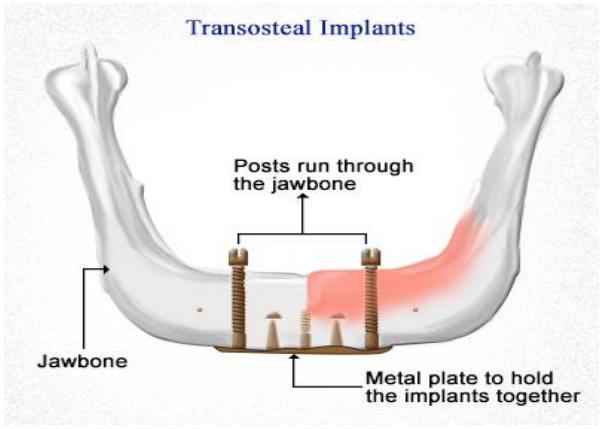
- A prosthetic device made of alloplastic material, which is partially or completely inserted or grafted into the oral tissues beneath the mucosal or periosteal layer or within the bone to provide retention and support for a fixed or removable dental prosthesis[(6)].

Classification of Dental Implants:-

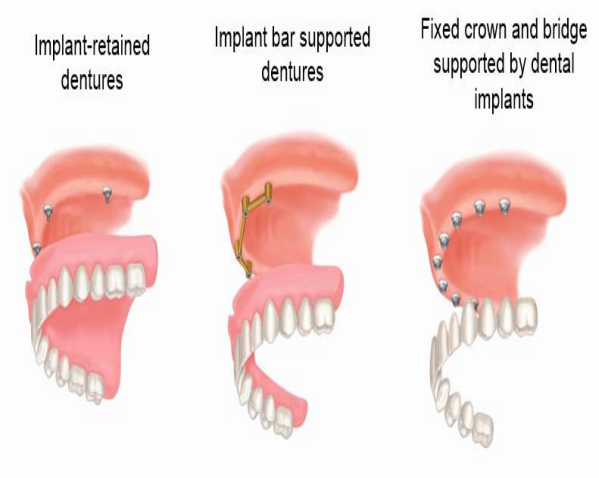
Based on implant design:-







Prosthetic Options in Implant Dentistry



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CASE PRESENTATIONS

By-**Dr Challang Marak**

Second year Post graduate student

Department of Prosthodontics

CASE 1 - MANAGEMENT OF BILATERAL CONDYLAR FRACTURE OF DENTULOUS MANDIBLE USING GUNNING SPLINT

CASE 2 - REHABILITATION OF HEMIMAXILLECTOMY PATIENT WITH ONE PIECE HOLLOW BULB INTERIM OBTURATOR

CASE 3 - REHABILITATION OF HEMIMAXILLECTOMY PATIENT WITH INTERIM OBTURATOR

CASE 1 - MANAGEMENT OF BILATERAL CONDYLAR FRACTURE OF DENTULOUS MANDIBLE USING GUNNING SPLINT

Introduction

The 'Gunning splint' initially was presented by Thomas Brain Gunning (1813–1889) for the immobilization of edentulous or partially edentulous jaw segments after reduction [1]

For edentulous patients, treatment planning poses greater difficulties during reduction and fixation of fractured atrophic mandible. Due to edentulism, guidelines provided by occluding teeth for reduction and fixation of fracture, are absent. Also, open reduction of fracture site is not helpful due to compromised medical condition of the patient at older age. The denture bearing area of the edentulous mandible is not only more easily fractured, but also has less possibility of rapid and uneventful healing [2] For such condition, closed reduction and fixation of fractured segment with Gunning type splint is preferred over open reduction technique. It holds together fractured segments of mandibular bone and immobilizes the jaws in occlusion

A Gunning splint for the edentulous mandible consists of a type of monoblock resembling two bite blocks joined together. These splints take form of modified dentures with bite block placed in posterior region and a space in incisal area to facilitate feeding. Immobilization is carried out by attaching the upper splint to maxilla by per-alveolar wiring and the lower splint to the mandibular body by circumferential wires. Intermaxillary splinting can be done by connecting two splints with wire loops or elastic bands [3,4]

In this clinical report, step by step method for fabrication of Gunning splint and its intraoral fixation in an edentulous patient is discussed

CASE REPORT 1 : A 62-year old female patient was referred to Department of Prosthodontics, from Department of oral and maxillofacial surgery for the fabrication of Gunning splint. History revealed that the patient had trauma in mandibular anterior region 5 days ago. On clinical examination, there was pain and swelling at the fracture site. OPG showed displaced mandibular condylar fracture of the right side. General condition of the patient was debilitated and frail. Hence, it was decided to perform closed reduction of the fractured mandible with Gunning splint instead of open reduction.

Procedure Used For The Fabrication Of Gunning Splint

Impression was made with irreversible hydrocolloid impression material (DPI India), and were immediately poured in dental stone to obtain casts. On this cast, the record bases were fabricated and occlusal rims were made. Tentative jaw relation was made by clinical judgement and it was mounted on an articulator. Then the occlusal rims were altered and the arch bar was incorporated on buccal side of each wax splint.

One anterior opening was made in rims for feeding purpose and posteriorly interlocking mechanism was provided to avoid any movement between two splints. The splints were made in heat cured acrylic resin (HEAT CURE, DPI, Mumbai).

The splints were checked in patient's mouth for extension and frenum relief. Then finishing and polishing of splints was carried out and they were disinfected in glutaraldehyde solution

During surgical procedure, first the maxillary splint was fixed with per-alveolar wiring. Mandibular splint was fixed by circum-mandibular wiring. After securing the splints to the underlying bone, intermaxillary fixation was done with arch wires to provide firm immobilisation. This was kept for 6 weeks after which it was replaced with elastics. OPG showed complete reduction of fractured segments

Discussion

Normal aging process is associated with significant changes in the functional vascular supply of mandible [5]. The endosteal supply from inferior alveolar artery begins to disappear and bone becomes increasingly dependent on periosteal network of vessels for its blood supply. Atrophic edentulous mandible has a reduced cross-sectional area as compared to dentate mandible. Due to decreased vascularity and dense sclerotic nature of bone, open reduction of mandible will lead to slow and complicated healing process of the fracture site [6]. If mandible is atrophic, then the fractured fragments will be more easily displaced. Due to decrease in bone height, it is not suitable for screwing and plating the fracture site. Close reduction with Gunning splint is advantageous because, not only it preserves the periosteal blood supply, but also provides firm mandibular fixation and immobilisation. [7]

Advantages

1.It does not require surgical exposure of fracture site
2.Can be used in both dentulous and edentulous patients
3.In edentulous cases, even the previous dentures can also be used as splints to stabilize the fractured segments, if the fracture line is present in the denture bearing area
4.It is a minimally invasive technique

Disadvantages

1.Inadequately secured splints—if circummandibular wires placed too close to the fracture site
2.Contraindicated in unfavourably displaced fractures
3.The splints may become foul, if proper oral hygiene is not maintained

Conclusion

In almost all the selected and planned cases of fractured atrophic edentulous mandible, a satisfactory union of the fractured segments can be obtained with Gunning type of splint. The splints are easy to fabricate, are cost effective and minimally invasive for the treatment of fractured jaw segments. Gunning type splints, when properly designed and planned for a particular case; prove to be a very good treatment option for fractured atrophic edentulous mandible

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CASE 2 - REHABILITATION OF HEMIMAXILLECTOMY PATIENT WITH ONE PIECE HOLLOW BULB INTERIM OBTURATOR

CASE 3 - REHABILITATION OF HEMIMAXILLECTOMY PATIENT WITH INTERIM OBTURATOR

Introduction

Prosthodontic therapy for patients with acquired surgical defects of the maxilla can be arbitrarily divided into 3 phases of treatment, with each phase having different objectives.

The initial phase is called surgical obturation and entails the placement of a prosthesis at surgery or immediately thereafter. This prosthesis must be modified at frequent intervals to accommodate for the rapid soft tissue changes that occur within the defect during the organization and healing of the wound. The primary objective of immediate surgical obturation is to restore and maintain oral functions at reasonable levels during the initial postoperative period.

The second phase of postsurgical prosthodontic treatment is called **interim obturation**. The objective of this phase is to provide the patient with a comfortable and functional prosthesis until healing is complete. The timing of the interim obturator phase is somewhat variable. This phase may not be necessary if the defect is small and the patient is functioning well with the immediate surgical obturator. However, variations in the extent of surgery as determined pre-surgically , rapid tissue changes immediately following surgery

The interim obturator prosthesis ″bridges the gap″ between the immediate surgical obturator and the definitive prosthesis. The division between an immediate surgical obturator and an interim obturator prosthesis is not well defined, but both have the same objective of maintaining patient comfort and function until the definitive prosthesis can be fabricated.

Case report 2 :

A 54 year old male patient came to the dept with a history of **resected maxilla of right side for stage 4 squamous cell carcinoma**

Intraoral Examination shows surgical defect on right side of the palate and extraoral examination reveals assymetrical facial appearance

Procedure

An irreversible hydrocolloid impression is **made** over the defect and the remaining teeth. **The** impression is poured with dental stone, a continuous type of retentive clasp was fabricated and modelling wax was adapted over the defect.

Interim obturator was processed in the laboratory by using salt out technique to obtain hollow bulb and inserted in the patients mouth after polishing and finishing and reline with the tissue conditioner.

CASE REPORT 3:

A 51 year old female patient with a history of Resected Maxilla Of Right Side For Squamous Cell Carcinoma came to the dept intraoral examination shows few remaining teeth on both the arches.

Procedure

An irreversible hydrocolloid impression was **made** over the defect and the remaining teeth. **The** impression was poured with dental stone, a modelling wax was adapted over the defect the teeth were arranged according to tentative jaw relation record.

Interim obturator was processed in the laboratory by using salt out technique to obtain hollow bulb and was inserted in the patients mouth after polishing and finishing

Discussion

The plan for rehabilitation should be discussed with the patient.The benefits, limitations, and sequence of prosthetic care should be explained to the patient. A few patients will have many questions, whereas others will not prefer extensive information, as discussion of the subject will evoke further anxiety. With the diagnostic aids he or she has obtained, the prosthodontist is prepared to consult with the surgeon and discuss the myriad of factors related to prosthetic rehabilitation**.**

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SPECIAL COMPLETE DENTURE

By- Dr Kanchan Aswani

Second year Postgraduate student

Department of Prosthodontics

INTRODUCTION

The conventional complete denture is a removable dental prosthesis that replaces the entire dentition and associated structures of maxillae or mandible. In spite of excellent professional skills, techniques, and humanitarian concern, many edentulous patients are mal adaptive to complete denture prosthesis. The increasing demand of patients and revolutionary thoughts of prosthodontists have led to the outcome of the special, that is, the unconventional approach for fabricating the complete dentures. The unconventional complete dentures follow new techniques based on same old fundamentals of prosthodontia. Complete dentures made in conventional manner prove satisfactory in most of the patients, but in compromised patients, conventional methods bring with it certain disadvantages. The conventional approach may not fulfill the five basic principles of complete denture such as stability, support, retention, esthetics, preservation of tissues which are of prime concern for the complete satisfaction of the patient. Routine complications faced by the dentist include atrophic ridge, flabby tissue, microstomia, xerostomia, bruxism, labially inclined premaxilla, esthetic demand, and patients demand for duplicating dentures. Management of these difficulties can be done by proper incorporation of suitable materials and modified techniques.

CASE 1: HOLLOW DENTURE

Severely atrophic ridges provide decreased retention, support, stability, and pose clinical challenge to the success of complete denture prostheses. Extreme ridge resorption also increases the interridge distance. Restoration of the vertical dimension and esthetics does demand increased height of the prosthesis and in turn leads to an increase in prosthesis weight. Reducing the weight of the denture by making it hollow enhances stability and retention, reduces further resorption of the jaw, thereby favoring the prognosis of the denture.

A 56 year old male patient reported to the Department of Prosthetic Dentistry for prosthetic rehabilitation of maxillary and mandibular edentulous ridges. Past medical history was not relevant. Past dental history revealed that patient was a denture wearer since 3–4 years and the maxillary dentures were loose. Intraoral examination revealed severely resorbed maxillary and mandibular edentulous ridges with increased inter-ridge distance. Labial,buccal mucosa, hard palate, soft palate and floor of the mouth were normal. Hence, hollow maxillary complete denture and

conventional mandibular denture was planned for this patient.

Technique:

- Complete the steps of conventional denture fabrication such as making a definitive maxillary impression and fabricating a trial denture
- Index the ledge of the master cast with the help of a conical bur and complete the sealing of the trial denture to the master cast
- Duplicate this denture using irreversible hydrocolloid and achieve the duplicated stone cast
- Fabricate a clear template of duplicated cast using a 0.3 mm thermoplastic sheet.
- Invest the trial denture into flask (cope) and put the counter flask (first drag) in the standard or conventional manner and complete the dewaxing stage
- Adapt the same temporary record base to the master cast (cope) and seal the borders adequately. This maintains the thickness of record base and provides more space for hollowing
- Take an another flask (second drag) to invest the record base and complete the wax elimination in a conventional manner
- Fill the cope and second drag with heat-polymerizing acrylic resin
- Deflask the cope from the second drag and keep the clear template on the master cast utilizing the indices in the ledge of the cast
- Pick an endodontic file with a rubber stop to check the available space between the template and the cured denture base
- Mix a food grade gelatin with water and heat it. This will form a viscous solution which can be filled in a disposable syringe.
- Inject the material through a hole created in the template leaving a 2–3 mm of gap between the injected material and the template Make sure that 1 mm of an additional space exists over the tooth portion of the denture
- Remove the template and cut the excess of injected material wherever required.
- Place the original cope onto the first drag and make sure of its complete closure. Then, mix the heat-polymerizing acrylic resin and pack it in the usual manner. At packing stage, the thickness of resin around the teeth can be gauged with the help of a periodontal probe
- Complete the processing and retrieve the denture for its finishing and polishing
- Laboratory remounting can be performed and the occlusion is adjusted if required. Prepare two openings with a bur into the denture base distal to the posterior teeth
- Remove the gelatin material with hot water filled in the disposable plastic syringe. Clean and disinfect the hollow cavity and pack the openings using an autopolymerizing acrylic resin
- Complete the denture polishing in the usual manner and check that the cavity is properly sealed by immersing the processed denture in water contained in a beaker. Confirm an adequate seal and deliver the denture to the patient

Case 2: Fluid retained denture

Resorption of alveolar ridges is a dynamic process. It is a continuous process with varying rates in individuals at different times. Due to the residual ridge resorption, complete denture prosthesis seldom remains in close adaptation to underlying soft tissues, causing tissue irritation, and alteration in the underlying mucosa. Fluid retained denture or liquid supported denture is a unique design for denture fabrication in cases where surgical removal of the flabby tissue and implant retained prosthesis cannot be planned. These dentures incorporate both plastic and elastic properties, acting as a soft liner at rest to prevent tissue soreness. Devan's dictum holds true in fluid supported denture cases as it provides long-term preservation of soft and hard tissues. The theory behind liquid supported dentures is when forces applied on dentures are absent, the base assumed its preshaped form that is the one while processing. In resting condition, the foil acts as a soft liner, while in use masticatory

loads get distributed in all directions by the liquid resulting in even stress distribution.

A 55-year-old male patient reported the Department of Prosthodontics and Crown & Bridge, for prosthodontic rehabilitation of the edentulous maxilla and mandible. The patient had a history of wearing complete dentures for 5 years which were loose and illfitting. Intraoral examination revealed edentulous maxillary and mandibular residual ridges. The overlying mucosa of maxillary ridge was flabby in the anterior region of the hard palate and the mandibular ridge was severely resorbed. The general condition of the patient was debilitated and frail. Keeping the various challenges associated with the case, clinical steps and treatment plan was modified to suit the patient's need. The treatment plan included the fabrication of a liquid-supported maxillary complete denture opposing a mandibular complete denture based on neutral zone concept.

Technique:

- The preliminary impressions of both the arches were made.
- Special trays were fabricated and border molding performed using low fusing impression compound
- The definitive impressions were made with Zinc Oxide Eugenol impression paste
- For maxillary, the flabby area was marked in the patient's mouth and transferred on the tray. Later, this area was cut forming a window to expose flabby mass and recorded by syringing light body addition silicone
- Jaw relations were recorded and face bow transfer was completed. The master casts were mounted by using centric relation record on a semi-adjustable articulator
- For mandibular, an acrylic tissue stops were prepared that maintained the established vertical height. Then, the neutral zone was recorded using tissue conditioner (Viscogel) by asking the patient to perform various functional movements. A putty index was formed around the recorded neutral zone into which the molten modelling wax was poured to duplicate the neutral zone.
- The teeth arrangement was carried within the limits of neutral zone and the waxed-up trial dentures were tried intraorally to check the appearance and occlusion.
- Prior to packing step, a 1 mm thick polyethylene was vacuum heat pressed on the maxillary master cast. The care was taken to keep the borders of adapted sheet approximately 2 mm short of the sulcus including posterior palatal seal area. The same sheet was planned to incorporate in the denture at the time of packing.
- After finishing and polishing, both the dentures were delivered after making necessary occlusal adjustments. The patient was advised to wear the dentures for 2- weeks. He was then recalled to convert the conventional maxillary denture into a liquid-supported one.
- The 2-weeks period was evaluated for the comfort level of the patient to the polyethylene sheet. At this appointment, the 1 mm thick sheet was removed from the tissue surface of the denture . This caused the creation of crevices all along the denture borders, which were further utilized during the final placement of 0.5 mm thick sheet.
- Then, an impression of tissue surface of denture was made by using a putty addition silicone and cast was poured. This helped to record the exact junction of the sheet to the denture surface.
- After this, a 0.5 mm thick polyethylene sheet was adapted on this cast which will create a 0.5 mm hollow space. The sheet was trimmed using the putty index as guide. The borders of the 0.5 mm sheet were placed in the crevice formed due to removal of 1 mm thick sheet. Cynoacrylate adhesive and auto-polymerizing acrylic resin was used to seal the borders and prevent escape of liquid.

- The 0.5 mm hollow space created was filled with glycerine. For this, two holes were drilled in the buccal flange especially molar area of the denture and glycerine was syringed through these holes.
- The vertical dimensions were checked simultaneously and the holes were sealed using self-cure acrylic resin. The seal was checked properly. In areas of leakage, it was resealed till a perfect seal was obtained at the junction.
- After completing polishing, the maxillary liquid-supported denture was delivered to the Proper instructions were given to him regarding denture care.

CASE 3: NEUTAL ZONE

Patient reported to the department with the chief complaint of difficulty in chewing food due to loss of teeth . The patient was edentulous for past fifteen years and was wearing complete denture prosthesis since then. Clinical evaluation revealed resorbed maxillary ridge with flabby tissues in the canine to canine region , and flat (atrophic) mandibular ridge and an increased interarch space.complete denture with neutral zone was planed as treatment for the patient.

Technique:

- The primary impressions were made using impression compound and metal stock trays and the cast poured using dental plaster
- Maxillary custom tray was fabricated using a full spacer design additional spacer was placed in the anterior region so that the flabby tissues could be recorded in an uncompressed state (mucostatic impression).
- Border molding was done using low fusing impression compound and wash impression was made with zinc oxide eugenol impression paste
- The mandibular final impression was made using custom tray, putty and light body consistency addition silicone material.
- Record base was made with self cure acrylic, and occlusion rims were prepared using modeling wax. After the registration of maxillamandibular relations, facebow record was taken and transfer to the articulator and casts were mounted.
- The neutral zone was recorded using mandibular compound occlusion rim.
- The mandibular wax occlusion rim was removed and retentive wire loops were attached to the record base in the premolar and molar area.
- Acrylic stents were made in the canine region for determination of the vertical height of the rim.
- Kneaded impression Compound was adapted to the denture base.
- Mandibular compound rim was softened in hot water and both Maxillary and mandibular record bases were placed in the patient's mouth. The patient was asked to carry out different functional movements like swallowing, sucking, whistling, smiling, licking the lips, and pronouncing vowels.
- Mandibular compound rim was taken out and Excess compound was trimmed away till the level of the acrylic stents and the material was re softened and replaced in the mouth asking the patient to repeat the functional movements.
- This procedure was repeated for about ten times so that a narrow accurate zone could be recorded. The resultant molded occlusion rim is the neutral zone of the patients where the teeth are to be set.
- The base of the cast was indexed by making notches.
- Plaster index of this recorded zone was made.
- The compound rim, the retentive loops and acrylic stents were removed.
- The index was replaced on the cast and melted wax was flown to obtain a wax rim in the neutral zone area
- Teeth arrangement was done checked by replacing the index
- The maxillary teeth were arranged according to the mandibular teeth
- Try in was done and the denture was processed, finished and inserted

Case report -1 : Hollowdenture

Intraoral examination

Gelatin mix injected through a hole into the clear template

Flasking of trial maxillary denture sealed to indexed definitive cast

Gelatin mix shaped to estimate outline of hollow cavity ofdenture

Clear template adapted to indexed definitive cast and an endodontic file used to estimate acrylic thickness

Finished and polished maxillary denture with openings prepared to facilitate removal of gelatin mix

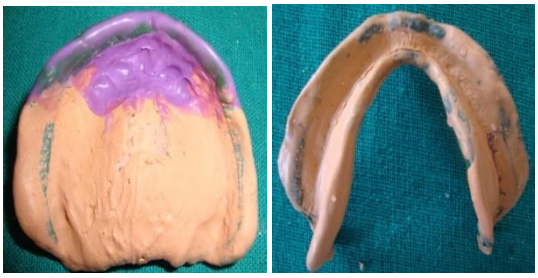
Case report -2 : Fluid retained denture

Intraoral examination

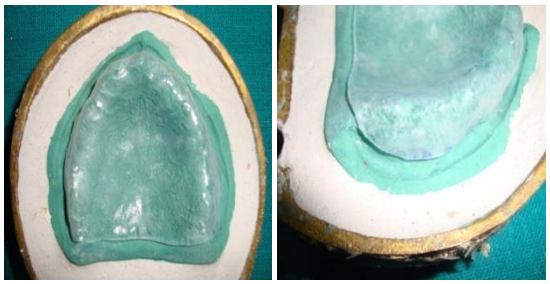
Recorded neutral zone

Primary impression

teeth set up



Final impression



A 1 mm thick polyvinyl sheet adapted on the invested master cast prior to packing and kept 2 mm short from the denture-limiting structures

Jaw relation

Silicone impression of tissue side

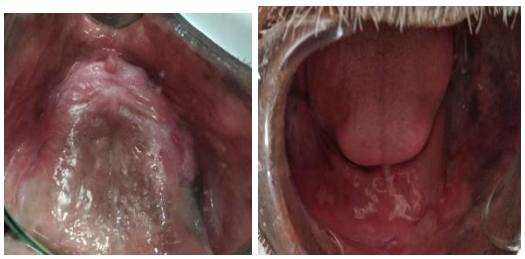
At recall appointment, 1 mm thick sheet is removed from the processed denture

Fitting surface of completed liquid-supported denture

Injecting glycerine

Intraoral view of prosthesis

Case report-3: **Neutral zone**



Intraoral examination

Primary impression

Facebow transfer

Replacement of wax rim with low fusing impression compound

Record of neurtal zone

Recording of neutral zone

Plaster index of the mandibular record base

Teeth arrangement in neutral zone

Try –in of denture

CASE PRESENTATIONS- FIXED PROSTHESIS

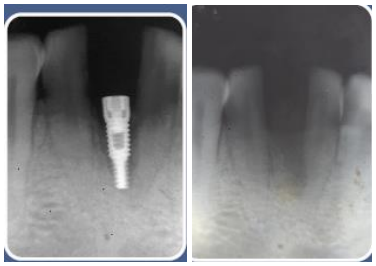
By- Dr Sukanya Ate

Second year Postgraduate student

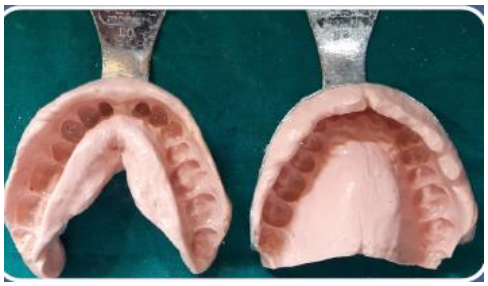
Department of Prosthodontics

Maryland bridge

A case of missing anterior tooth with a history of implantitis reported to the department of prosthodontics. A conservative approach was taken and it was decided that a Maryland bridge is the best possible option for this case.



The X-rays were taken and a primary impression was made.



Primary cast

Tooth preparation done in the patient's mouth

Final impression

Master cast

Bisque trial

Final prosthesis in place

PIER ABUTMENT

Patient with missing lower right first premolar and first molar tooth.

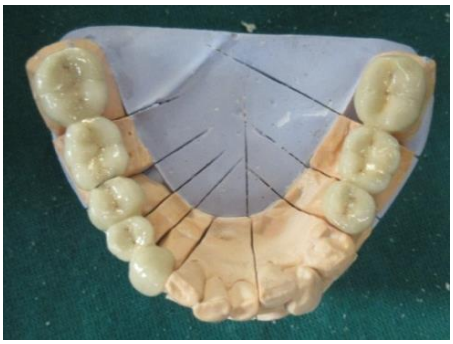
In order to give a stable occlusion a Pier abutment was finalised for this case.

Preparation on contralateral side.

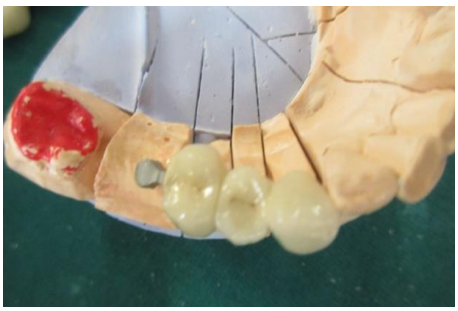
A lock and key design was incorporated in the prosthesis

Distal component of the Pier abutment

Mesial component



Final prosthesis



Mesial component with the key on the distal end of the prosthesis. In case of pier abutment when the occlusal forces act on the distal tooth, the prosthesis get detached from the key- keyway joint providing the required flexibility to the prosthesis which prevents it from getting fractured.

Final restoration in place

Final occlusion in the patient’s mouth

Pre-op

Post-op

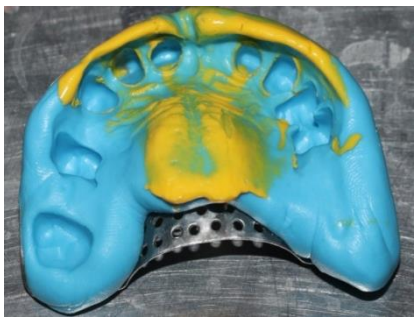
VENEER

A young girl with midline diastema of 4mm

Labially tilted left central incisor. As a conservative approach veneer was planned in this case

Preparation was done on the right central, right and left lateral incisor for veneer prosthesis and a full ceramic crown preparation was done on the left central incisor.

Gingival retraction cord in place



Final impression

Lithium disilicate crowns

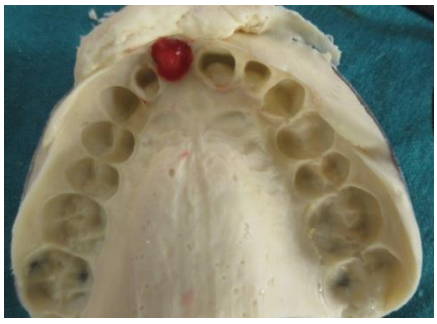
Final prosthesis in the mouth with diastema closure

Palatally aligned left central incisor

IMMEDIATE FIXED PARTIAL DENTURE

A lady, teacher by profession came with the complaint of discolored left central incisor tooth. As in her profession she cannot afford to have any edentulous time period so an immediate fixed prosthesis was planned for this patient. Implant was not possible for this case as there was a history of trauma and the tooth had inclined labially and the buccal cortical plate was thinned out.

Tooth preparation was done



Wax blockout done in the impression where extraction is indicated.

Prepared teeth

Final cast

Temporary prosthesis

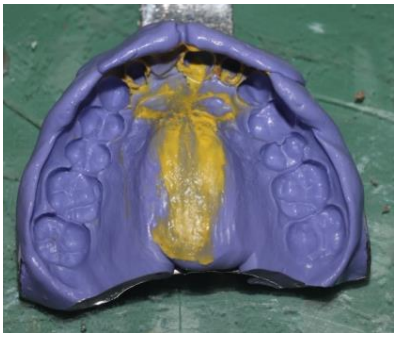
Extraction of the discolored tooth

temporary prosthesis in place immediately after extraction.

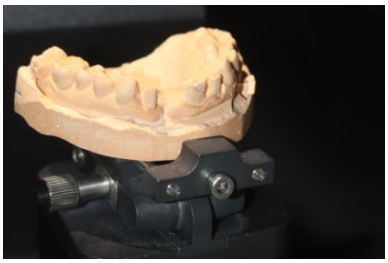
Temporary prosthesis was placed in the mouth for a period of one month for complete healing of the socket.

Final tooth preparation after complete healing of the extraction socket.

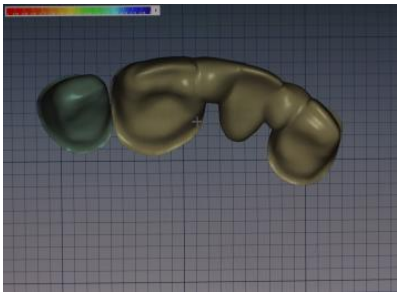
Final prosthesis in the mouth



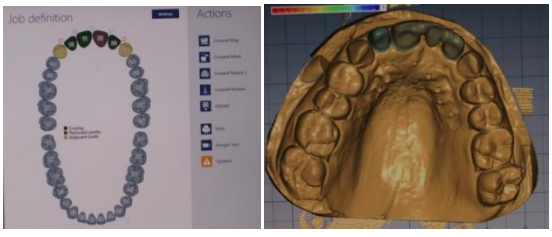
Final impression



Data of the impression was collected using extraoral lab scanner



Digitally designed prostheses using the CAD-CAM software



Post op image of the patient

Pre-op

Post-op

DEPARTMENT OF PERIODONTOLOGY

DENTAL IMPLANT

By- Dr. Mayuri Ghike
First year Postgraduate student
Department of Periodontology

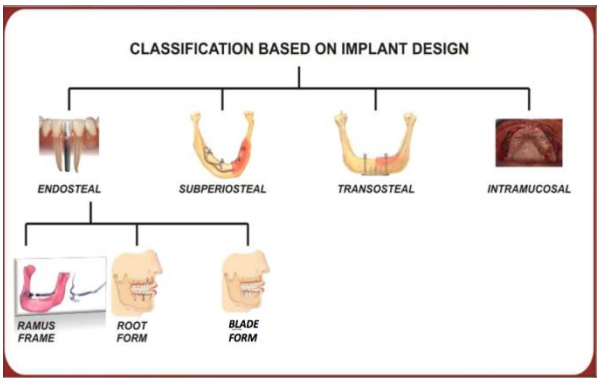
INTRODUCTION

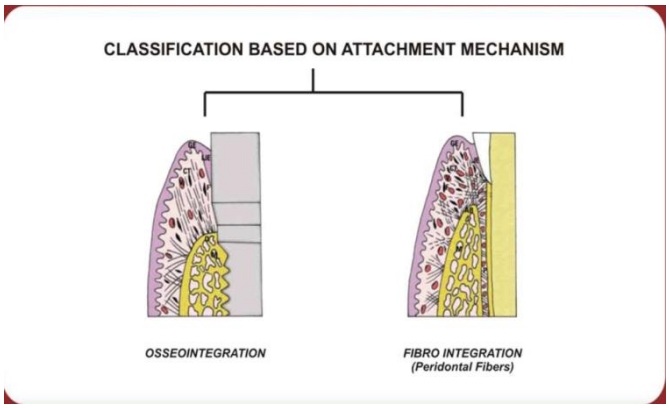
During the last decade, implantology has become an indispensable part of mainstream dentistry, helping dentists to improve the quality of life of large patient populations.

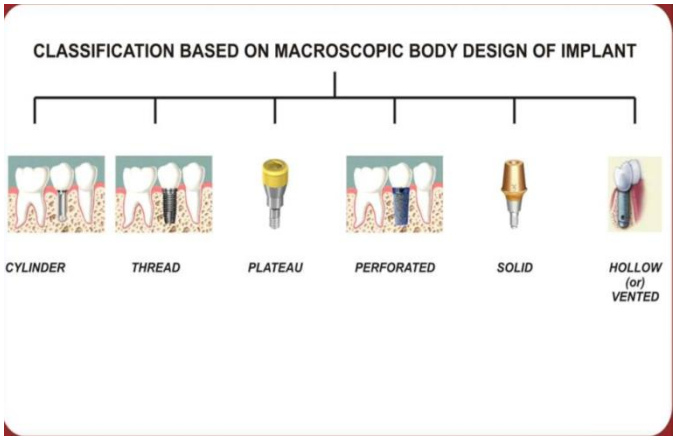
- A dental implant, are prosthetic devices of alloplastic material implanted into the oral tissues beneath the mucosal and/or periosteal layer, and on/or within the bone,to provide retention and support for a fixed or a removable prosthesis.

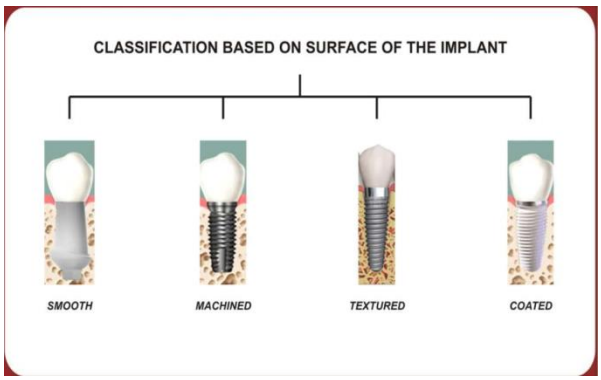
Five types of classification

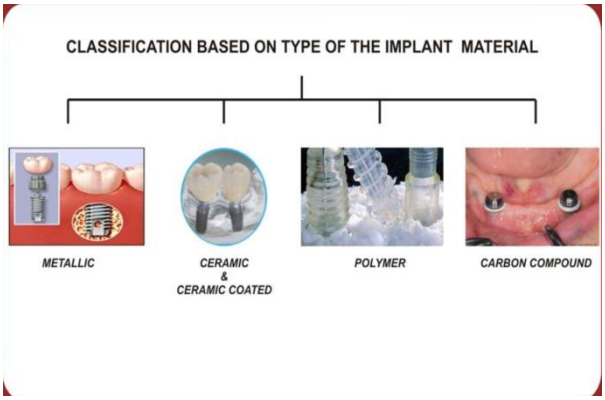
- 1.Based on implant design
- 2.Based on attachment mechanism
- 3.Based on macroscopic body design
- 4.Based on the surface of the implant
- 5.Based on the type of the material







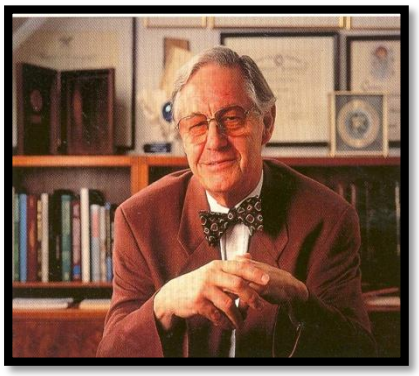




OSSEOINTEGRATION

Its objective is a predictable tissue response to the placement of tooth root analogues. Osseointegration in clinical dentistry depends on an understanding of the healing and reparative capacities of hard and soft tissues.

The concept of Osseointegration was developed and **Dr. Per-Ingvar Branemark**, Professor at the institute for Applied Biotechnology, University of Goteborg, Sweden, coined the term.[1]



DEFINITIONS

- **American Academy of Implant Dentistry (AAID)** defined Osseointegration as "contact established without interposition of non-bone tissue between normal remodeled bone and an implant entailing a sustained transfer and distribution of load from the implant to and within the bone tissue".[2]
- Clinically ankylosis of the implant bone interface-"Functional ankylosis" - **Schroeder and colleagues (1976)**[3]
- "Direct structural and functional connection between the ordered, living bone and the surface of load carrying implants" - Branemark and associates (1977)[4]

The description of osseointegration as "a process whereby clinically asymptomatic rigid fixation of alloplastic materials is achieved, and maintained, in bone during functional loading"[5]provides specific parameters for the clinical assessment of implants in situ.

Osseointegration is also referred to as ***secondary stability.***[6]

Phases of Osseointegration[2]

PHASE	TIMING	EVENTS
1. INFLAMMATORY PHASE	Day 1-10	Adsorption of plasma proteins Platelet aggregation and activation Clotting cascade activation Cytokine release Specific cellular inflammatory response Macrophage mediated inflammation
2. PROLIFERATIVE PHASE	Day 3-42	Neovascularization, Differentiation, Proliferation and activation of cells Production of immature connective tissue matrix

3. MATURATION PHASE	After Day 28	Remodelling of the immature bone matrix with coupled resorption and deposition of bone. Bone remodelling in response to implant loading

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4. Branemark PI. Osseointegrated implants in the treatment of the edentulous jaw. Exprience from a 10-year period. Scand. J. Plast. Reconstr. Surg.. 1977;2:16.
5. Zarb G, Albrektsson T. Osseointegration: a requiem for the peri- odontal ligament. *Int J Periodontics Restor Dent*. 1991;11(2):1–88.
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HARD TISSUE AUGMENTATION FOR IMPLANTS

By- Dr. Yugandhara Desurkar

First year Postgraduate student

Department of Periodontology

Introduction:

The alveolar process is sensitive to variety of environmental and physiologic factors that influence it's ability to function and maintain it's integrity. These environmental and physiologic factors cause varying degrees of alveolar bone loss.

- Alveolar bone loss can be

1. Congenital (Fig 1(a))
2. Result of trauma, pathology, and chronic/acute infection (Fig 1(b))
3. Periodontal disease (Fig 1(c))
4. Following tooth extraction (most common) (Fig 1 (d))

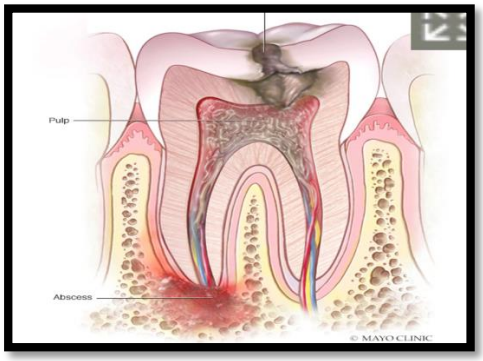


Fig 1(a)

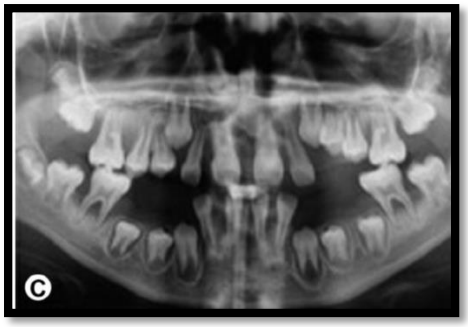


Fig 1 (b)

Fig 1(c)

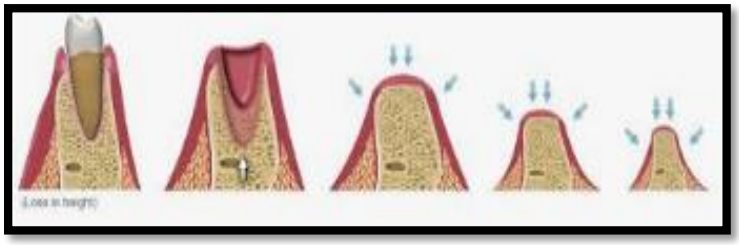


Fig 1(d)

Before implant therapy became available, the physiology and healing patterns of edentulous

ridge after tooth was extracted were often neglected or not dealt with properly. Today, implant placement in severe cases of alveolar resorption is a well understood and recognized challenge that significantly impacts the success of implant therapy.

Tarnow & Eskow 1995; Sclar 2004; Seo et al. 2004, suggested protocols to minimize ridge resorption or correct clinically unfavorable ridge deficiencies. Ridge augmentation procedures consider basic biologic and physical principles of bone to enhance regenerative potential of the host.

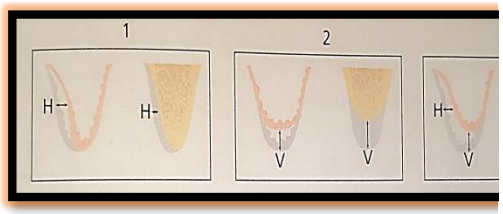
There are basically three principles in alveolar bone regeneration and they are as follows:

1. Promoting primary wound closure
2. Enhancing cell proliferation and differentiation
3. Protecting initial wound stability and integrity

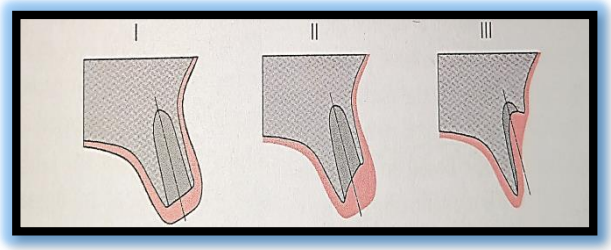
Defect Classification:

Bone availability is the main prerequisite for safe and predictable implant placement. In order to decide appropriate bone augmentation strategy, the available bone crest must be carefully evaluated. To decide what kind of defect it is there are two classifications as follows:

1. Alveolar crest defects, Seibert classification (1983):
    a) Class 1 defects: when the bone deficiency is predominantly in horizontal dimension.
    b) Class 2 defects: When bone deficiency is predominantly in vertical dimension
    c) Class 3 defects: When bone deficiency affects both vertical and horizontal dimension



2. Extraction sockets defect, Hammerle and Jung (2008):
    a) Class I: Extraction socket that has intact bone walls after tooth extraction.
    b) Class II: Extraction socket that has a marginal dehiscence/ fenestration of the buccal bone wall
    c) Class III: Extraction socket that has a large dehiscence of the buccal bone wall after tooth extraction



Regenerative materials:

Different regenerative materials are used for the purpose of regeneration after natural tooth loss or extraction of infected teeth as follows:

1. Barrier Membranes: This includes e-PTFE, titanium scaffold applied between two e-PTFE layers, for stiffness and reinforcing the membrane structure.
2. Bone Grafts: Autogenous bone graft is a gold standard for bone grafts. It can be either block graft or particulate graft.
3. Bone Substitutes: They are as follows
    a) Allografts: DFDBA, FDBA
    b) Xenografts: Bovine and Equine
    c) Alloplasts: Combination of hydroxyapatite and beta-tricalcium phosphate

Ridge Preservation:

According to Vignoletti et al 2012, ridge preservation technique can be defined as, “Any therapeutic approach carried out immediately after tooth extraction aimed to

preserve the alveolar socket architecture and to provide the maximum bone availability for implant placement."

- Following approaches should be utilized for GBR:

1. Use of grafts with membranes
2. Socket should be healed by primary intention
3. Flapped surgical procedures

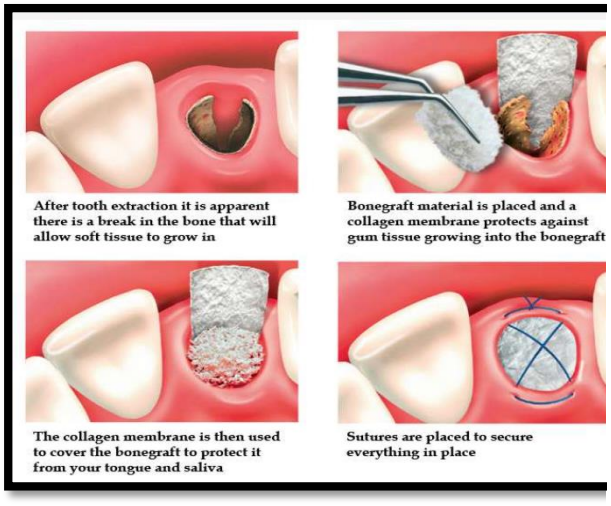
Bone Regeneration in Fresh Extraction Sockets:

Immediate and early implant placement(type 1 & 2) protocols have been indicated as the most suitable for implant placement following tooth extraction.

Type 1 immediate implant surgical protocol combined with other treatment concepts:

1. Immediate implant placement with graft and/ or barrier membranes and/ or a soft tissue graft.
2. Immediate implant placement with immediate loading.

Socket preservation is another treatment protocol for bone regeneration in fresh extraction socket. The procedure of socket preservation is as explained in following diagram.



Horizontal Ridge Augmentation:

It is another treatment modality for bone regeneration in bone deficient alveolar ridges. It can be performed using particulate or block grafts with or without barrier membranes

- In class 1 defects, particulate graft with barrier membrane(GBR) is indicated.
- In severe class 1 defect, block graft is indicated.

Ridge Splitting/ Expansion:

Summers (1994) first used this technique, osteocondensation, to augment bone width and elevate sinus floors in an attempt to avoid the lateral window sinus lift. This technique is preferably used in maxilla.Chisels and osteotomes are used to produce greenstick fractures in the bone and create osteotomy sites without need for drilling, preserves compromised bone volume.Bone is compressed to lateral surface.It allows for the ideal implant diameter to be placed.

Vertical Ridge Augmentation:

It is highly technique sensitive procedure.

Three main groups:

1. GBR
2. Onlay bone-block grafting
3. Distraction osteogenesis

Emerging Technologies:

There are some recent emerging technologies in this field and they are as follows:

1. Growth Factors:

a) PDGF: PDGF alpha and beta expressed in regenerating hard and soft tissues.
b) BMPs: They have ability to induce ectopic bone formation.

2. Cell Therapy:

cell therapy acceleratesedentulous ridge regeneration through following mechanisms

a)Use of cells as carriers to deliver growth or cellular signals.

b) Provision of cells which are able to differentiate into multiplecell types to promote regeneration.

3. Scaffolding matrices to deliver cells and genes:

When applied to tissue engineering, scaffolds should

a) Provide 3D architecture
b) Have a high porosity and surface to volume ratio
c) be biocompatible
d) Degrade at controlled rate and pattern

- Prefabricated scaffolding matrices:

A) Naturally-derived:

Include autografts, xenografts, allografts like FDBA

B) Synthetic Biomimetic Polymers:

Polymers like PLGA (Poly lactic-co-glycolic acid)

- Computer-based applications in scaffold design and fabrication:

3D printed scaffold will precisely fill defect

Conclusion:

Implants as a replacement of lost teeth is a trending treatment modality as well as future of dentistry. For placement of an implant there should be presence of adequate bone width and height. Ridge augmentation procedures have become increasingly predictable. The correct selection and application of the available techniques and biomaterials are key determinants of implant survival/success rate.

HORIZONTAL RIDGE AUGMENTATION- CASE PRESENTATION

By- Dr. Sanket Shinde

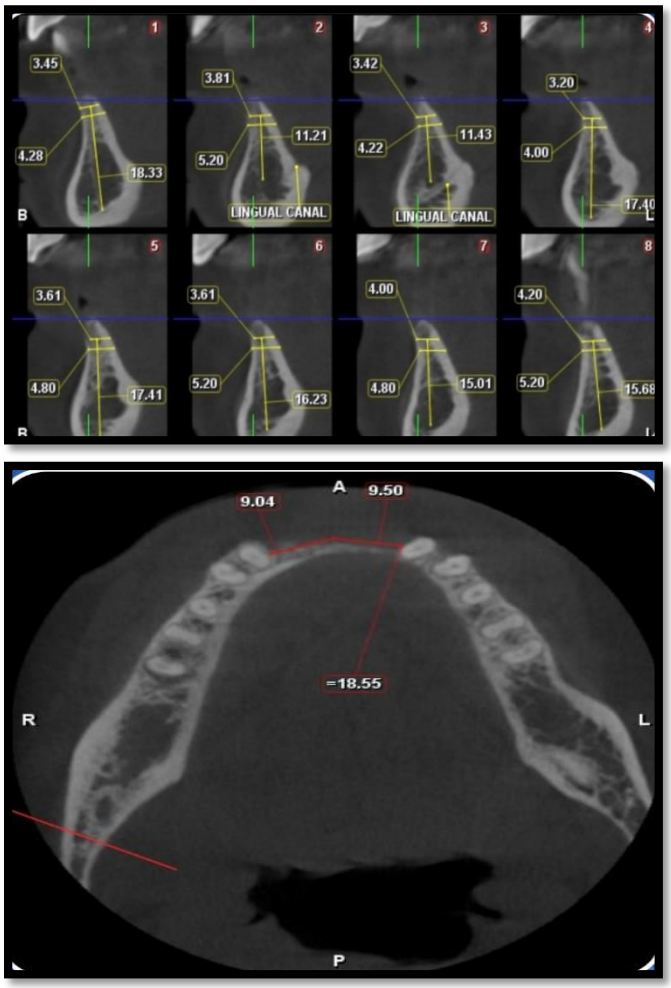
Third year Postgraduate student

Dept. of Periodontology

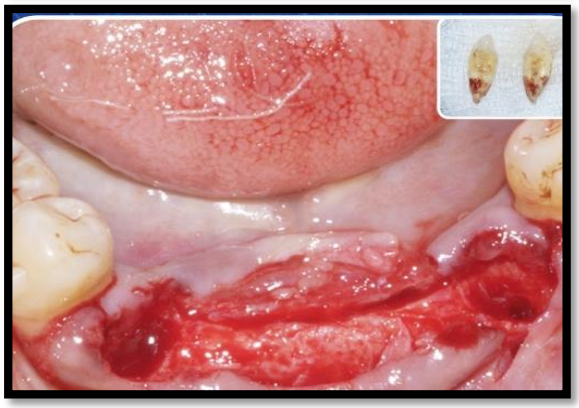
Horizontal ridge augmentation

RIDGE EXPANSION WITH IMMEDIATE AND DELAYED IMPLANT PLACEMENT

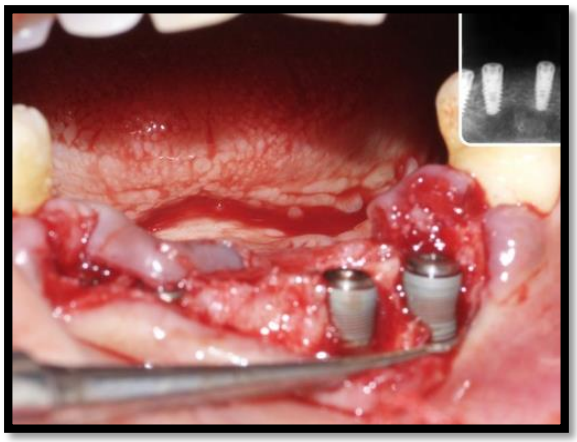
A patient complaining of unesthetic appearance in lower front teeth region due to missing teeth, reported to the department of periodontology. No obvious medical history was present. Clinical examination revealed missing 31 32 41 42 and grade III mobility wrt 33 43. CBCT examination was done which showed decreased buccolingual width of alveolar ridge. So treatment given was extraction with 33 and 43, followed by ridge expansion and immediate implant placement with 43 and 33. Implant placement with 32 and 42 was done after 6 months.

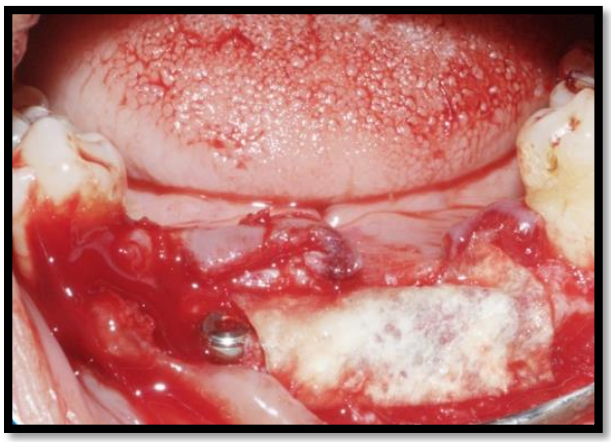


Pre- operative CBCT



Pre-operative picture and Reflection of full thickness flap with extraction of 43 33





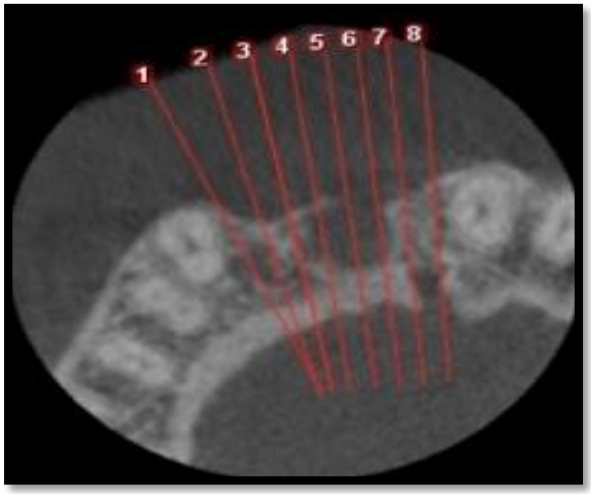
Implant placement, FDBA and chorion membrane placed

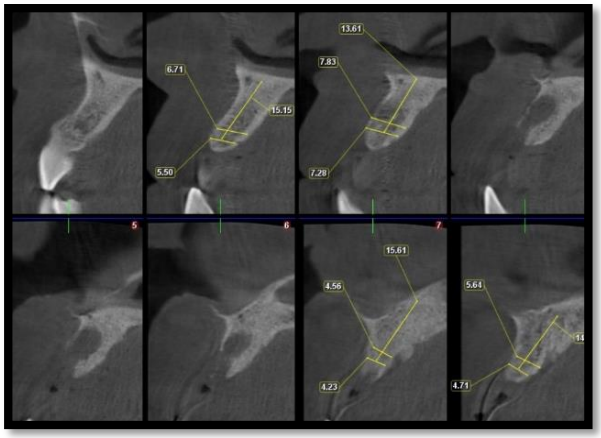
Stage II surgery and prosthesis placement

RIDGE AUGMENTATION (GBR)-AUTOGRAFT

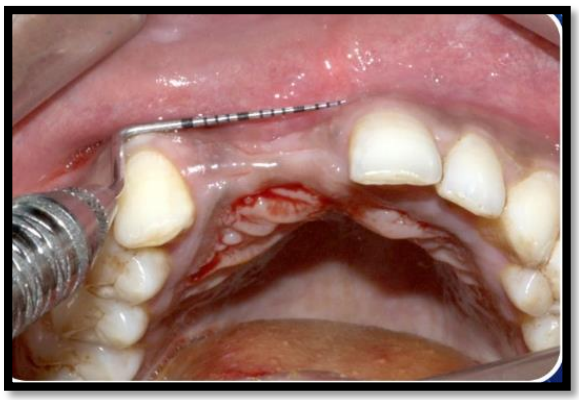
A 26 year old male patient reported to the department of periodontology complaining of missing tooth. He has trauma 2 years back due to which he had lost his tooth. Clinical examination revealed missing 11. CBCT examination was carried out which

showed deficient alveolar ridge. Ridge augmentation using autogenous bone graft was planned. Mid-crestal and vertical incisions were given wrt 12 11 and 21. Full thickness flap was reflected. Debridement was done. Recipient site was prepared by de-cortication. Autogenous graft was harvested from symphysis region. Graft was secured at recipient site by titanium screws. FDBA graft was placed followed by PRF membrane and pericol. Suturing was done

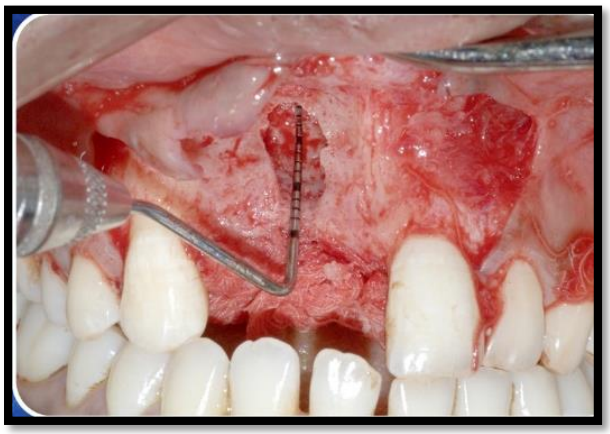


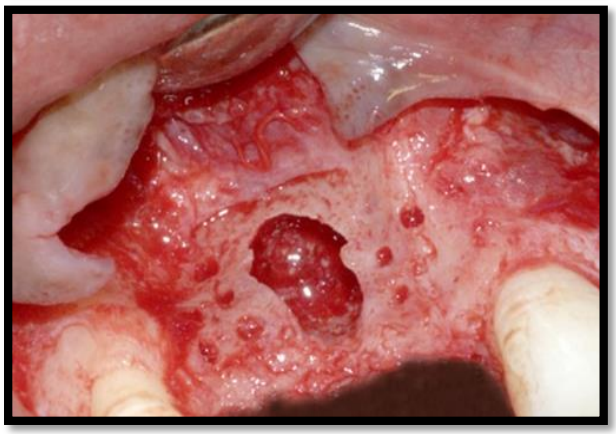


Pre- operative CBCT

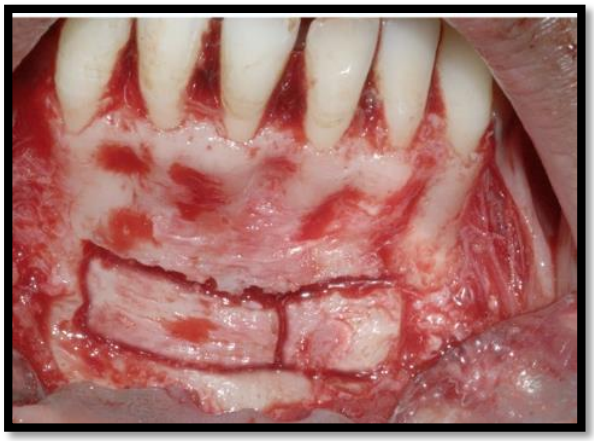


Pre-operative picture and mid-crestal and vertical incision



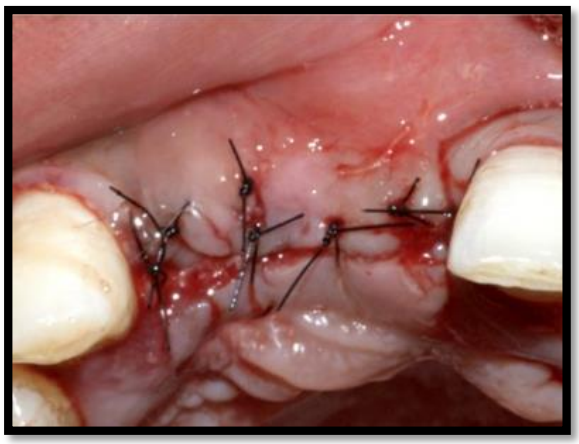


Full thickness falp reflected and decortication done



Donor site for autogenous graft and stabilization of graft at recipient site

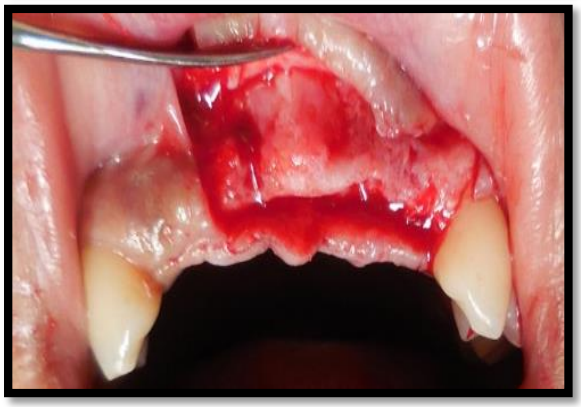
FDBA and PRF membrane placed followed by placement of periocol



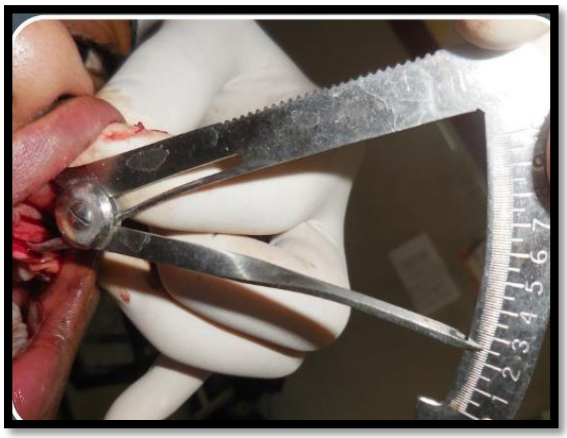
Suturing and 5 month follow up picture

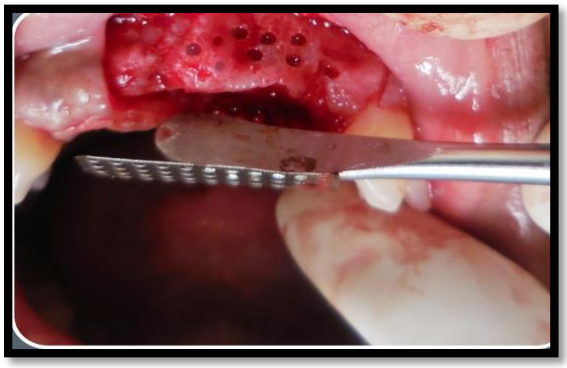
RIDGE AUGMENTATION- TITANIUM MESH TECHNIQUE

A 32 year old patient reported to the department of periodontology complaining of unaesthetic appearance due to missing front teeth since 1 year. Missing 12 11 21 and 22 were seen on clinical examination. CBCT examination revealed inadequate bucco-lingual alveolar ridge width. Ridge augmentation using titanium mesh was performed. Implants were placed after 6 months.

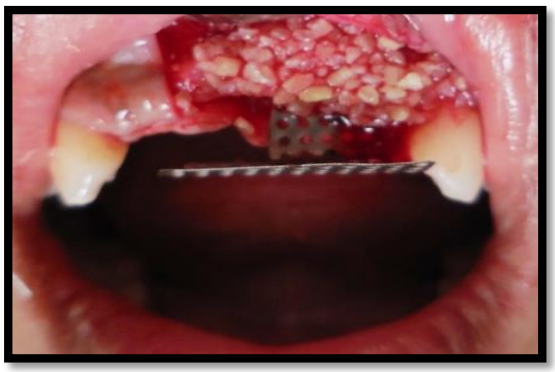


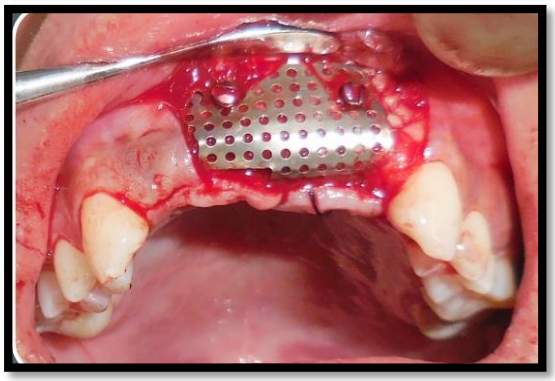
Pre-operative photograph and flap reflection





Measurement of alveolar ridge dimension and decortication

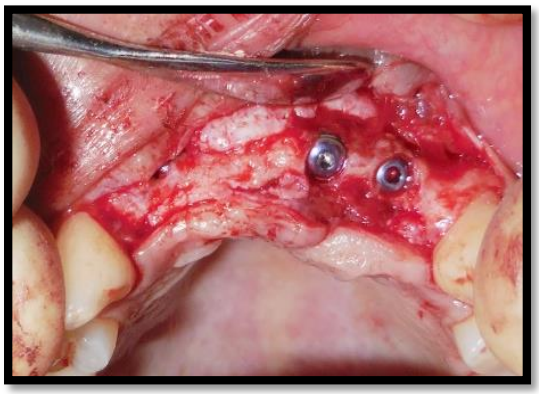




Placement of graft material along with Ti-mesh

Suturing

6 months post-operative mesh removal and post- augmentation dimension



Placement of implant and prosthesis

VERTICAL AUGMENTATION, IMMEDIATE IMPLANT AND SINUS LIFT

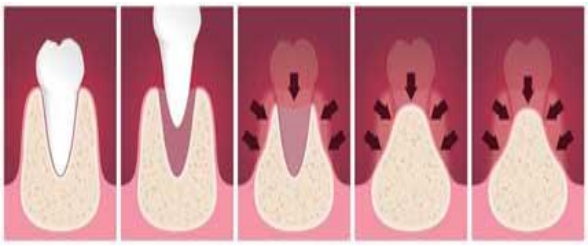
By- Dr. Rupali Shastri

Second year Postgraduate student

Department of Periodontology

Introduction

Following extraction/loss of teeth, it is estimated that there is 25% volume loss in 1st year and 40% volume loss by 3rd year. Deficient/ Deformed ridges complicate implant rehabilitation and prosthetic treatment. For placement of dental implant, a minimum of 5-6mm for alveolar bone width is recommended or 1-1.5mm of bone width around all lateral aspect of the implant after its delivery. In some instances edentulous spaces planned for dental implant treatment require reconstruction of ridge deficiencies.



Vertical augmentation can be performed by following methods

1. Shell technique – By Khoury
2. Modified shell technique
3. Using block grafts- Iliac crest

   Tuberosity region

   Ramus region

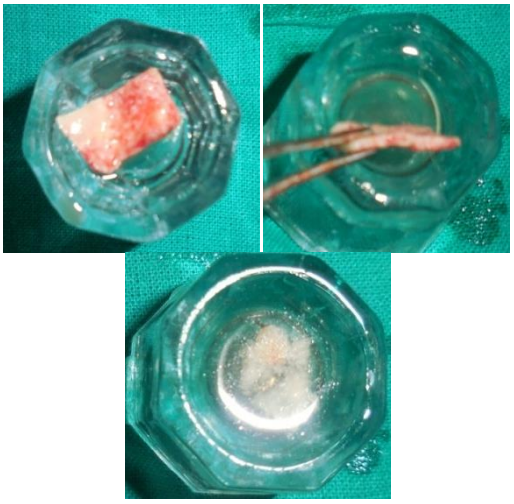
   Chin region.
4. Using titanium mesh

Modified Shell Technique

A 26 yr old male reported to the department of periodontology, complaining of missing tooth. He had history of trauma 4 years back causing avulsion of upper left central incisior which was reimplanted at that time. Then there was trauma to same tooth 7 months back making it mobile which was then advised for extraction.

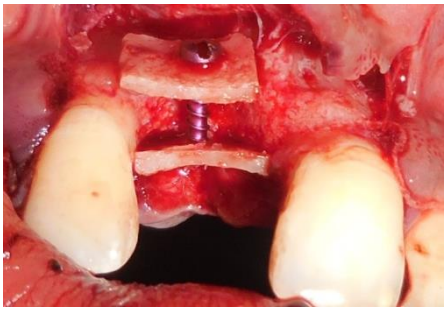
CBCT evaluation showed deficient alveolar ridge in bucco-palatal direction. So ridge augmentation using modified shell technique was planned. After administration of anesthesia, crestal incision was given, flap was reflected and recipient site was prepared. Graft was harvested from symphysis region. Bone shells were trimmed using burs to thickness of 1mm. Particulate graft is obtained while bone shell trimming. Bone shells anchored with titanium screw at recipient site. Particulate graft and bone chips placed in the space between two shells. Chorion membrane was placed over it. And suturing was done. 6 months post-operative CBCT showed increased bucco-lingual width. Then Implant was placed.

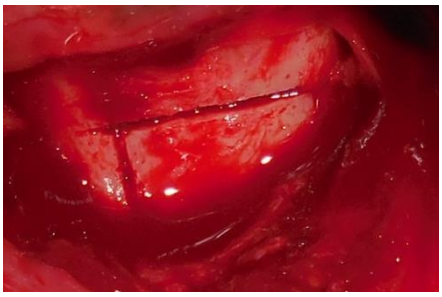
Preoprative picture



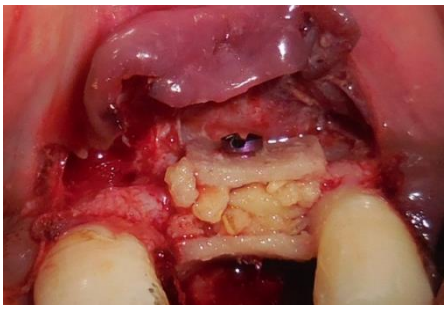
Trimmed bone shells and particulate bone graft

Mesio - distal distance and Apico - coronal distance of alveolar ridge



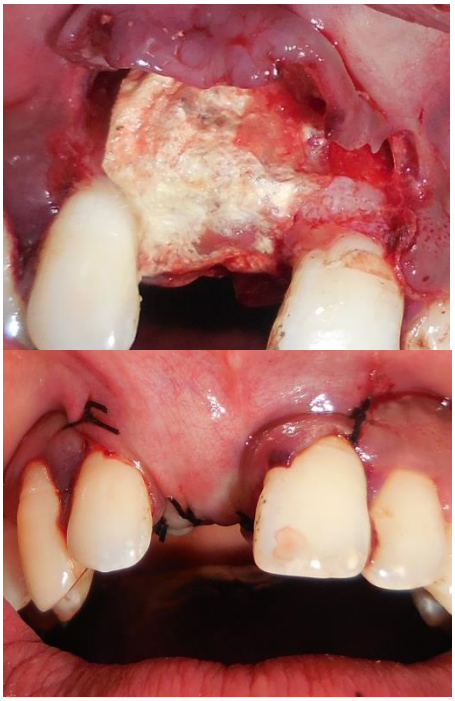


Donar site preparation



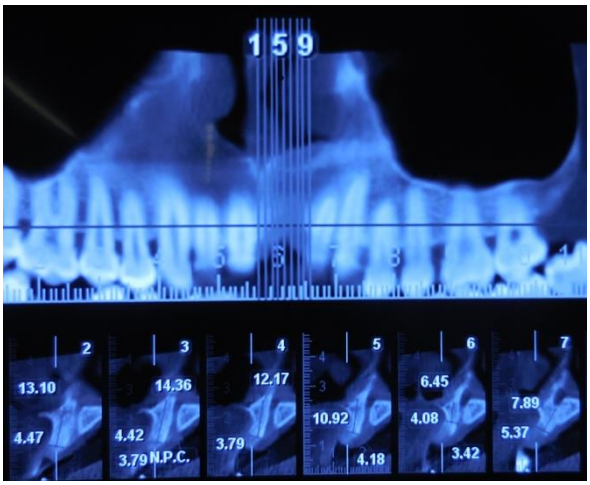
Fixing of bone shells by titanium screw and placement of bone chips and particulate graft

Donor site suturing

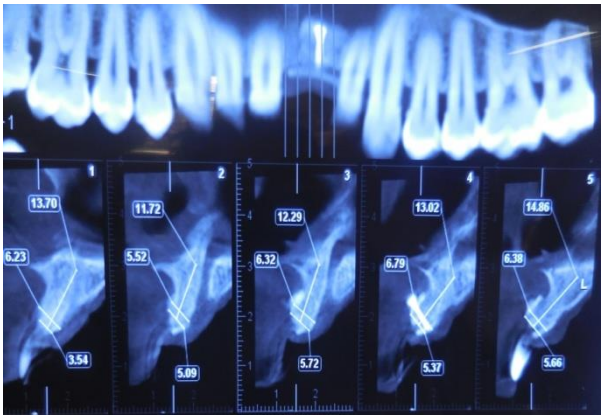


Placement of chorion membrane and suturing.

Final Prosthesis placement



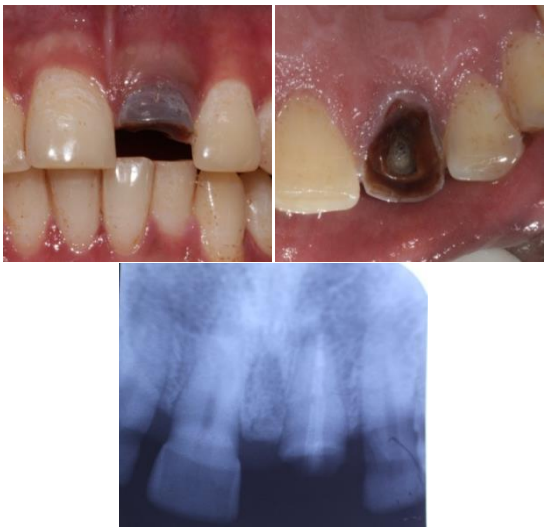
Pre-operative CBCT



Post- operative CBCT

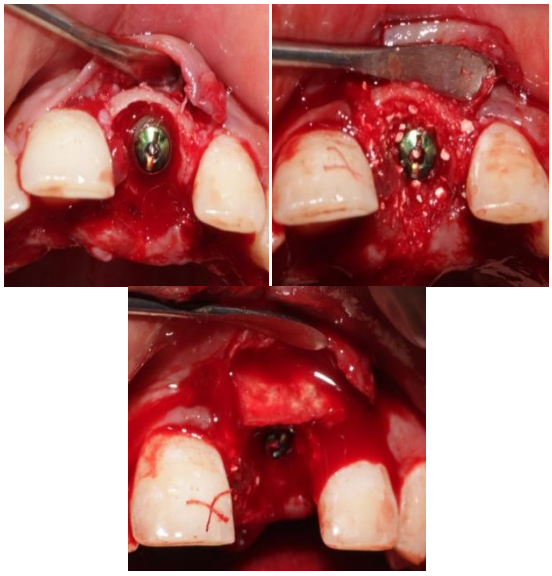
Immediate implant placement:

A 23 yr old male patient, complaining of discolored and fractured tooth in front region, repoered to the department of periodontology. He had history of trauma 5 years ago. Clinical examination showed Ellis class III fracture with 11. After radiographical examination, immediate implant placement was done.

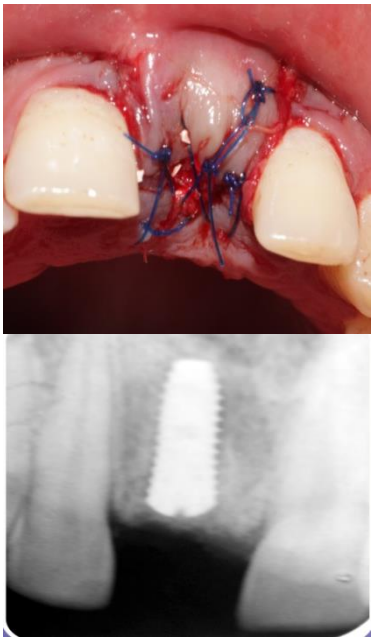


Pre-operative photographs and IOPA

Post extraction socket and extracted tooth



Implant placement, FDBA plcaed and chorion membrane placed



Suturing and Post implant placement IOPA

After final prosthesis placement

Sinus lift procedure

After extraction of maxillary posterior teeth, sinus undergoes pnuematization due to which floor of sinus lies near alveolar ridge, making challenge in placement of implant. For making room for implant placement sinus lift procedures are carried out. It is mainly of two types, direct sinus lift procedure (lateral window technique) and indirect sinus procedure (transcrestal approach)

Classification of sinus lift procedures

LATERAL WINDOW TECHNIQUES

- Modified Caldwell-Luc approach (Tatum)
- Ultrasonic ostectomy (Torella)
- Piezoelectric bony window osteotomy (Vercellotti et al)
- Trephine (Emtiaz)
- Antral membrane balloon elevation (Soltan and Smiler)
- Other variations – Hinge osteotomy

  Elevated osteotomy

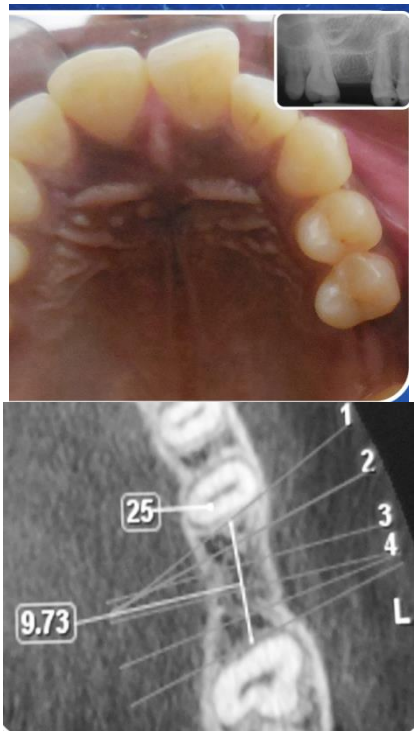
  Crestal osteotomy

TRANSCRESTAL APPROACH TECHNIQUES

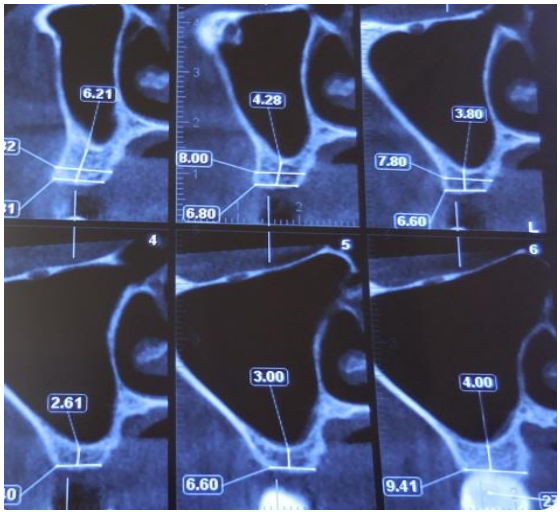
- Osteotome technique (Summers)
- Modified osteotome technique (Davarpanah et al 1996)
- Hydraulic pressure- saline (Sotirakis and Gonshor)

Crestal sinus lift along with implant placement (Indirect sinus lift, With Grafting)

A 32 year old male reported to the department of periodontology, complaining of missing tooth since 4 years. On examination, missing 26 was seen. CBCT examination showed inadequate subantral height. Sinus lift procedure was carried out by crestal approach using graft material. Simultaneous implant placement was done.



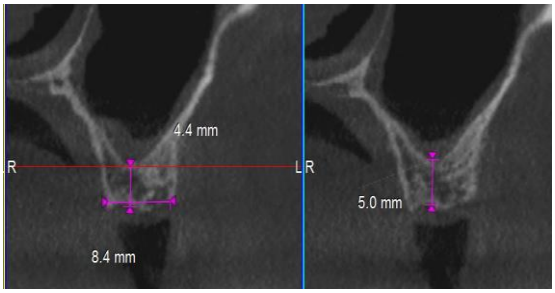
Preoperative picture and CBCT axial view



Measurement of sub-antral height

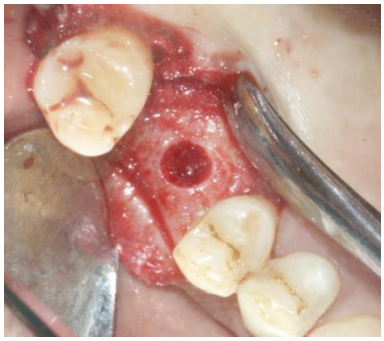
Indirect sinus lift using hydraulic method

A 54 year old male reported to the periodontology department, complaining of missing teeth since 8 yrs. Clinical examination showed missing 26. Due to inadequate subantral height on CBCT examination, crestal sinus lift procedure was planned without grafting by hydraularic method.



Measurement of sub-antral height

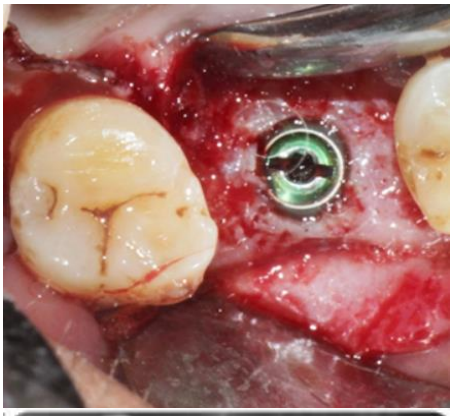
Post- opertaive photograph and IOPA



Preparation of osteotomy site

Hydraulic sinus lift

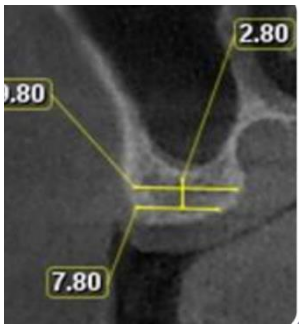
Crestal sinus lift along with implant placement (Indirect sinus lift, without grafting)



Simultaneous implant placement and Post-operative IOPA

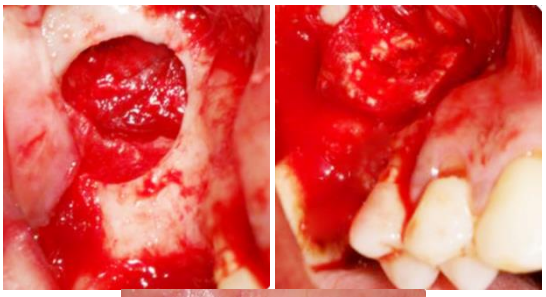
Lateral sinus lift with simultaneous implant placement (Direct sinus lift)

A 46 Yr old male patient presented with missing teeth since 5yrs to the department of periodontology. Missing 16 was seen on clinical examination. CBCT was carried out to check bone condition. On CBCT, inadequate sub-antral height was seen. Lateral sinus lift was proposed for treatment along with implant placement.

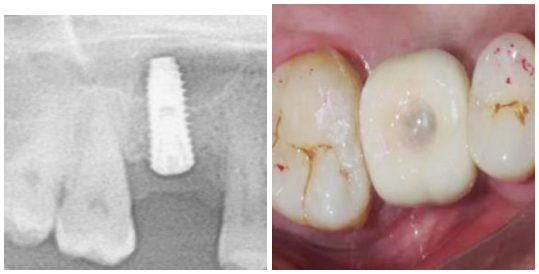


Measurement of sub-antral height

Incision



Lateral window preparation, Placement of graft and collagen membrane and implant placement



Post-operative IOPA and prosthesis placement

Conclusion:

The surgical interventions to imporove hard tissue have provided improved countours if not optimum. This enables a close to ideal implant placement that is best conductive to a biomechanically and esthetically viable techniques. Using these techniques implant placement will help to achieve stable harmony of hard and soft tissue to improve its functionability.

PRESERVE THE SOCKET, SHIELD THE SOCKET - A REPORT OF 3 CASES

By- Dr. Vaishnavi Ramakant Chodankar

Postgraduate student

Department of Periodontology

ABSTRACT

After tooth extraction, remaining socket heals from the apex towards base and the infiltration of soft tissue at the crest often results in facial and crestal bone loss. For improving aesthetic considerations in the pre-prosthetic and corrective procedures of the alveolar ridge post extraction, Socket preservation is considered. Socket shield technique utilises a shield of tooth in the socket to preserve the buccal bone over the implant. This present article presents two cases treated with bone graft and barrier membrane by preserving the socket and one case of immediate implant placed with socket shield technique.

Keywords: Socket preservation, shield, implant, bone graft, barrier membrane.

INTRODUCTION

Major goal of rehabilitation is to achieve and maintain harmony between pink and white zones especially in aesthetic area. After tooth extraction alveolar bone undergoes reduction in horizontal as well as vertical dimensions alongwith soft tissue alterations. The severity of the healing pattern may pose a problem for the clinician in 2 ways: it creates an esthetic problem in the fabrication of an implant-supported restoration or a conventional prosthesis; and it may make the placement of an implant challenging if not unfeasible.[1] An average of 40% - 60% of original height and width is expected to be lost after tooth extraction with the greatest lost happening within the first two years.[2] Independent research by Lekovic, Simion, Iosella and Boyne showed that following extraction, the height and width of the anterior alveolus undergo a loss of 1 - 2 mm in all three dimensions.[3] Recent literature reviews have documented horizontal bone loss of 29% to 63%, with vertical bone decreases of 11% to 22% at 6 months, following extraction.[4]

Socket preservation technique allows for more ideal placement for the final esthetics with improved emergence profile and gingival architecture. Principle is based on guided tissue regeneration where a barrier membrane is placed over an extraction socket to prevent migration of epithelial cells. The use of barrier membrane with bone replacement graft has shown better results than barrier membrane or bone graft alone. The thickness of buccal bone plate in maxillary anterior region is

less than 1 mm in most cases and undergoes more resorption than palatal bone. Socket shield technique provides a promising treatment modality to manage these risks and preserve the postextraction tissues in esthetically challenging cases.[5] The principle is to prepare the root of a tooth, which is indicated for extraction, in such a manner that the buccal/facial root section remains in place.

The present case report describes two cases of socket preservation technique followed by delayed implant placement and one case of immediate implant placement by Socket Shield technique.

CASE 1

A 36 years old male patient reported to the department of Periodontology with the chief complaint of pain in the lower right back tooth region. The medical history was non-contributory. On examination disto-occlusal caries were present with 46. IOPA showed distal cervical and root caries involving the pulp. Patient was planned for socket preservation followed by implant placement. Following administration of local anesthesia 1:80000 lignocaine with adrenaline, sulcular incision was given around 46. Sectioning of the tooth was done followed by atraumatic removal with a periotome. Extraction socket was irrigated with normal saline and curetted to remove any debris and was grafted with a mixture of DFDBA, FDBA and hydroxyapatite. Platelet rich fibrin membrane was placed followed by Perio-Col membrane. 3-0 reverse cutting nonresorbable sutures were placed. Postsurgical instructions included antibiotics and analgesic medication and chlorhexidine 0.12% oral rinse. The patient was also instructed to defer from tooth brushing or any mechanical trauma in the area for 2 weeks. Clinical and radiographic evaluation of the site was done after 6 months postoperatively. Complete preservation of hard and soft tissue was noticed at the surgical site. Flap was reflected after giving crestal incision. Osteotomy site was prepared and 5mm x 10mm Dentium implant with coverscrew placed. Interrupted sutures were given with 3-0 reverse cutting silk. Minimally invasive Stage II surgery was done and gingival former placed after 3 months of implant placement. Screw retained tooth coloured PFM crown was placed.

CASE 2

A 25 year old female was referred to department of Periodontology with the chief complaint of mobility with 11. Patient had history of trauma with 11 one month ago with Ellis Class 3 fracture and had undergone reattachment procedure for same. On examination grade I mobility was present with 11. Socket preservation followed by implant placement was planned for patient. Under local anesthesia, sulcular incision was given with 11 and atraumatic extraction was done with periotome. Extraction socket was curetted and irrigated with normal saline. Grafting was done with a mixture of DFDBA, FDBA and hydroxyapatite graft followed by placement of PRF membrane. Suturing was done with 3-0 reverse cutting nonresorbable sutures. Post surgical instructions were given and patient was kept under followup. After 6 months, clinical and radiological evaluation was done and implant planning was done. Crestal incision was given under local anesthesia and flap was reflected. Implant osteotomy site was prepared by sequential drilling and 4.5mm x 10mm Dentium implant with coverscrew placed. Grafting was done with DFDBA and FDBA graft on the buccal aspect of implant followed by placement of chorion membrane. Suturing was done and patient was given post surgical instructions. Patient was delivered a temporary Maryland bridge after 2 months and is under folllowup for definitive prosthesis.

CASE 3

A forty year old male came with a chief complaint of broken tooth. On examination root piece was present with 11. Clinical and

radiographic evaluation was done and immediate implant placement with socket shield technique was planned. Following administration of local anesthesia, the tooth was sectioned into buccal and palatal parts using a long root resection bur. This was intended to preserve the buccofacial half of the root intact and undamaged. Periotomes were used to sever the PDL and palatal section of root was then carefully removed without traumatizing the buccal root section. The extraction socket was then curetted to remove any granulation tissue. The implant osteotomy site was prepared and drilling was initiated using a lance drill to engage the palatal aspect of the root so that the buccal aspect would remain intact. A 4.5mm x 10mm Dentium implant with coverscrew was placed. On the buccal side, it had the remaining buccal portion of the root which had thin layer of dentine, followed by cementum, PDL, and bundle bone in socket. Remaining jumping space was grafted with DFDBA and FDBA followed by PRF membrane placement. Interrupted sutures were placed and post surgical instructions were given. Definitive prosthesis was delivered after 6 months.

DISCUSSION

In the first year following extraction, bone resorption can result in up to 2mm vertical and 4mm horizontal loss. Whether due to caries, trauma or advanced periodontal disease, tooth extraction and subsequent healing of the socket commonly result in osseous deformities of the alveolar ridge, including reduced height and reduced width of the residual ridge.[6] This can be overcome by ridge preservation procedures in extraction sockets using grafting materials with or without barrier membranes. The characteristics of the bone replacement graft and the barrier membrane greatly affect the final result. The first barrier membrane used for extraction socket augmentation was expanded polytetrafluoroethylene (pTFE), which required primary closure and a second surgical procedure. In badly damaged sockets, a combination of membranes can be used. The bone graft materials that have been used are primarily osseoconductive, providing a scaffold for bone formation. The materials commonly used are autogenous bone, anorganic bovine bone, freeze-dried bone allograft, and beta tricalcium phosphate (bTCP), which all are osseoconductive, as well as DFDBA, which is osseoinductive. The various grafting materials can be combined to change the characteristics of the bone replacement graft. If DFDBA plus CaS is used as the basic graft, it can be made more substantial for badly damaged sockets by the addition of ABH or bTCP. For those patients who do not want a bone replacement graft from human or animal sources, bTCP is a suitable alternative that has been reported to be 60% to 70% resorbed at 6 months.[7] There are other critical factors for ridge preservation at time of extraction which are atraumatic extraction to preserve alveolar bone and flap design to preserve papillae height. Loss of alveolar bone height following tooth extraction was lower in the sockets where a grafting material was inserted as compared to what was observed where natural healing by clot was allowed.[8] In the socket-shield technique (SST) the root is bisected, and the buccal two-third of the root is preserved in the socket so that the periodontium along with the bundle bone and the buccal bone remains intact. A classification of SST technique is proposed by Kumar and Kher et al depending on the position of the shield in the socket.[5] This classification is required so as to help in understanding the preparation design and the role of shield and in maximizing the usage of the shield to achieve best possible esthetics in immediate implant placement sites.

Advantages of socket-shield technique

It is a minimally invasive surgical procedure, aimed at preserving a part of the root to help in maintaining hard and soft-tissue contours. It minimizes the need of soft and hard tissue grafting procedures and hence shortens the overall treatment duration. Even in cases with adjacent implants, the interdental papilla can be preserved by preparing interdental socket shield. This is a highly promising technique in terms of maintaining pink and white esthetics and provides a solution for esthetically critical cases such as high lip line and maxillary anteriors. This technique not only preserves but also helps to maintain the hard and soft tissues, in future, as long as the shield is intact

Limitations of the socket shield technique

The clinician needs to be specially trained and need to have a high degree of clinical skills. The procedure requires a little more time and patience to avoid mobility in the shield. If the shield becomes mobile during surgery, it is removed and the conventional immediate implant placement or the grafting procedure is to be done. The case selection is very important for the success of the procedure. The technique is not recommended in mobile teeth, teeth which are out of the arch and teeth with large periapical lesions. The intactness of the shield plays an important role in the success of the treatment.

CONCLUSION

Socket preservation maintains the height and width of the remaining viable alveolar ridge post extraction. This can be achieved through adequate flap design whenever needed, atraumatic extraction, adequate selection of grafting material and the membrane barrier. Beside ridge preservation, socket preservation reduces post-operative bleeding and prevent dry socket in addition to promotes faster healing of hard and soft tissue.

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1. Lekovic V., et al. “Preservation of alveolar bone in extraction sockets using bioabsorbable membranes”. Journal of Periodontology 69.9 (1998): 1044-1049.
2. Hom-Lay Wang., et al. “Socket Augmentation: Rationale and Technique”. Implant Dentistry 13.4 (2004): 286-296.
3. Robert Horowitz., et al. “Clinical Evaluation of Alveolar Ridge Preservation with a B-Tricalcium Phosphate Socket Graft”. The Compendium of Continuing Education in Dentistry 30.9 (2009): 588-590.
4. Tan WL, Wong TL, Wong MC, Lang NP. A systematic review of post-extractional alveolar hard and soft tissue dimensional changes in humans. Clin Oral Implants Res 2012: 23 (Suppl 5): 1–21
5. Kumar PR, Kher U. Shield the socket: Procedure, case report and classification. J Indian Soc Periodontol 2018;22:266-72.
6. Mecall RA, Rosenfeld AL. Influence of residual ridge resorption patterns on implant fixture placement and tooth position. 1. Int J Periodontics Restorative Dent 1991; 11(1):8–23.
7. Gordon Douglass. “Socket Preservation Techniques”. Inside Dentistry 2.8 (2006).
8. Giovanni Serino., et al. “Ridge Preservation Following Tooth Extraction Using a Polylactide and Polyglycolide Sponge as a Filler: A Clinical and Histological Study in Humans”. Clinical Oral Implants Research 14.5 (2003): 651-658.

CASE 1:

Fig 1a: Pre-operative view

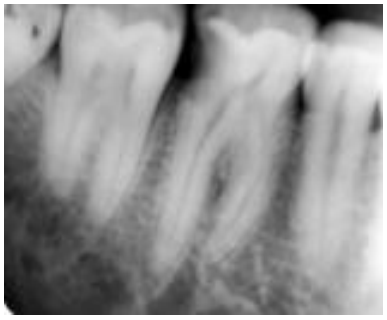


Fig 1b: IOPA with 46

Fig 1c: Sectioning of tooth

Fig 1d: Tooth extracted

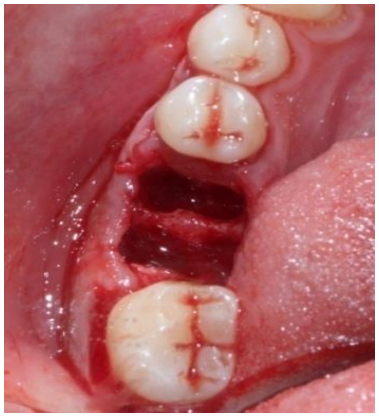


Fig 1e: Extraction socket

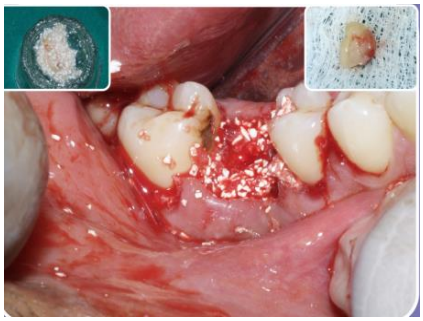


Fig 1f: DFDBA, FDBA, Hydroxyapatite Graft placement

Fig 1g: PRF placed

Fig 1h: PerioCol Membrane placed

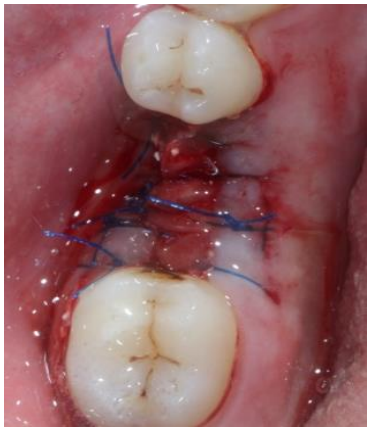


Fig 1i: Sutures placed

Fig 1j: Follow-up After 6 months

Fig 1k: Bucco-lingual dimension

Fig 1l: Implant placement

Fig 1m: Gingival former placed

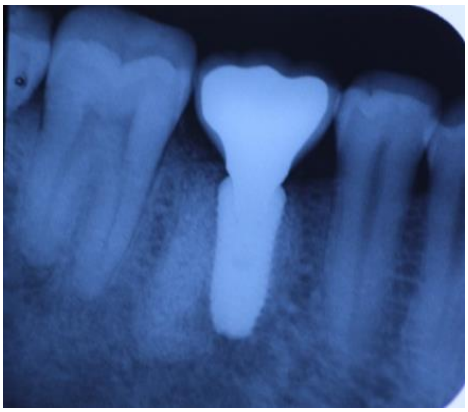


Fig 1n: Prosthesis IOPA

Fig 1o: Prosthesis with 46

CASE 2:

Fig 2a: Pre-operative view

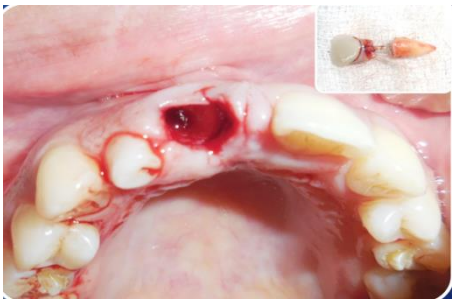


Fig 2b: Atraumatic extraction

Fig 2c: DFDBA, FDBA & Hydroxyapatite Graft placement

Fig 2d: PRF membrane placed

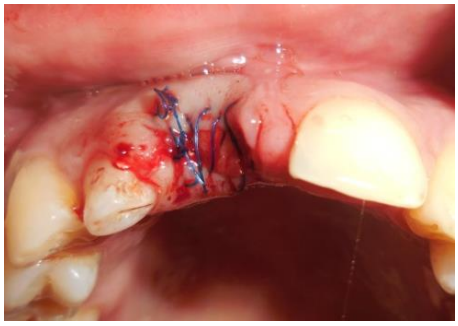


Fig 2e: Suturing done

Fig 2f: Followup after 6 months

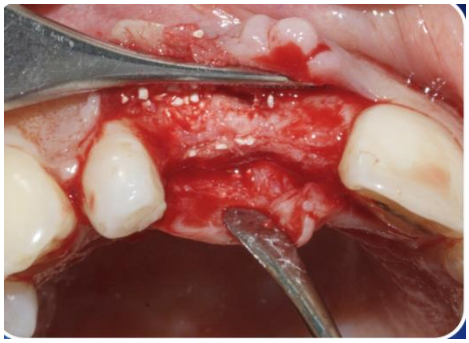


Fig 2g: Full thickness flap reflected

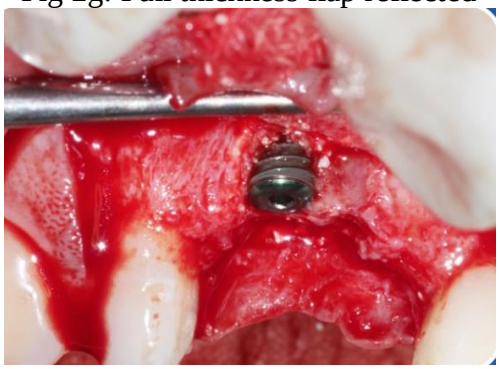


Fig 2h: Implant placement

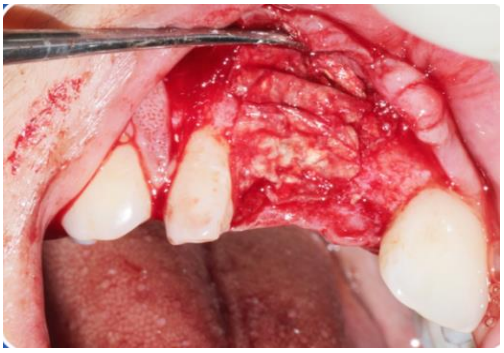


Fig 2i: DFDBA, FDBA Chorion membrane placed

Fig 2j: Sutures placed

Fig 2k: Temporary prosthesis delivered

Fig 2l: Maryland bridge

Fig 3a: Pre-operative view

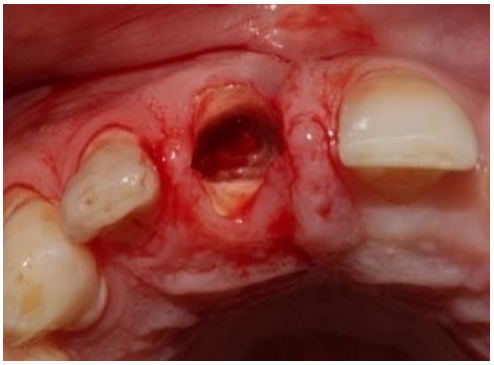


Fig 3b: Sectioning of tooth

Fig 3c: Removal of palatal part

Fig 3d: Implant placement

CASE 3:

Fig 3e: Implant with 11

Fig 3f: DFDBA, FDBA and PRF membrane placed and sutured

Fig 3g: Prosthesis with 11

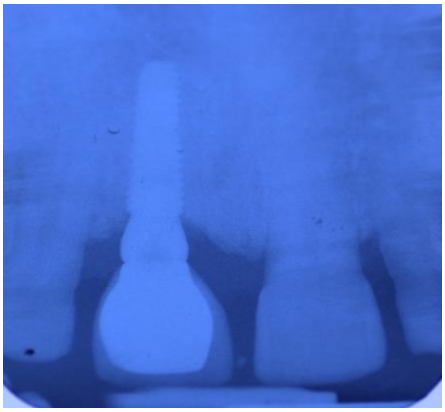


Fig 3 h: Post operative I

MANAGEMENT OF POST-IMPLANT COMPLICATIONS: A CASE SERIES

By- Dr. Pinky M. L.

Postgraduate student

Dept. of Periodontology

Abstract

The increasing mean age of the population, and consequently edentulism, necessitates the demand for prosthesis. Owing to the drawbacks of the removable partial denture and fixed partial denture, the implant as a treatment option has become popular. But with the use of implants,

complications are bound to occur. Management of these complications make implantology a success and thus, common complications are discussed in this case series.

Keywords: Complication, Implants, Management.

Introduction

The advancing mean age of the population, and consequently edentulism, necessitates the demand for prosthesis. Dental implants have become an reliable alternative for the treatment of lost teeth since the last decade. According to a retrospective study by McDermott et al.[1] an overall frequency of implant-related complications is 13.9%.

With the advancement, implantology is at its boom and following are the related complications:

- Anatomy-related complications
- Treatment plan-related complications
- Procedure-related complications
- Early and late complications
- Mechanical complications

This article presents a series of cases related to implant complications with their treatment.

CASE 1

A 62-year-old female patient reported to the department of periodontology with the chief complaint of missing teeth within the upper left region of the jaw. There was no significant relevant medical history. On intraoral examination, missing teeth 16, 26, 27, 36 were revealed. According to CBCT, the residual bone measurement for the prospective implant site was approximately 3.2 mm. As a result of which direct sinus lift procedure was opted for.

Full-thickness flap was reflected after administering local anesthetic with adrenaline after giving mid-crestal incision with 26 and 27 region and vertical releasing incisions on the mesial line angle of 25. Thinning of the lateral window to gain access for the sinus membrane elevation was done with a round bur. During the sinus elevation, sinus membrane perforation of approximately 6–7 mm occurred. Perforation of sinus membrane was managed by 6-0 resorbable chromic gut suture followed by placement of collagen membrane, i.e., periocol.

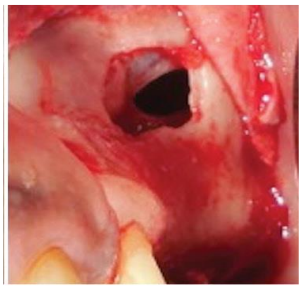
Following perforation repair and sinus membrane elevation, osteotomy site preparation and implant placement 4.5 mm × 10 mm Osstem implant was done with respect to 26. The sinus space was packed with DFDBA + FDBA + hydroxyapatite and collagen membrane (Periocol). 3-0 reverse cutting direct loop sutures were placed.

The patient was prescribed tablet amoxicillin and clavulanic acid 625 mg 2/day for 5 days, tablet diclofenac 50 mg 2/day for 3 days, and tablet cetirizine 5 mg 2/5 days. Chlorhexidine gluconate 0.2% mouthrinse twice daily for 2 weeks was prescribed to the patient.

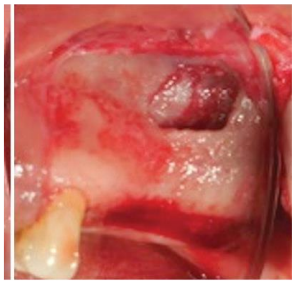
The second-stage implant surgery was done with scalpel, and healing abutment was placed. A screwed-retained metal-ceramic prosthesis was delivered. Lateral sinus lift with delayed implant placement was planned in the 27 region.

Mid-crestal and vertical incision

Full-thickness flap elevated exposing the lateral bony wall



Perforation of sinus membrane encountered during membrane elevation

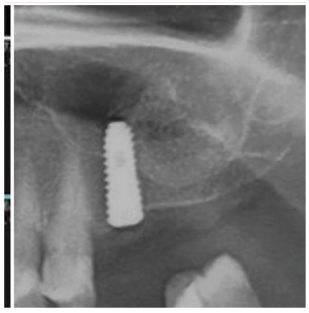


Perforation repair was done with 6-0 chromic gut suture

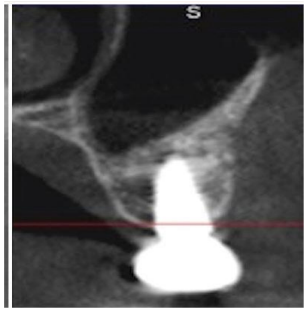
Collagen membrane placed to repair the perforated sinus.

Implant placed with 26.

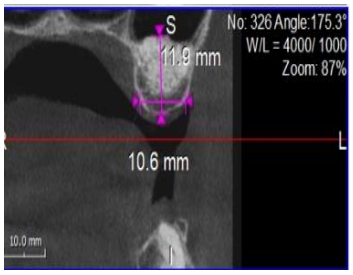
Metal-ceramic prosthesis.



Preoperative Cone-beam computed tomography



Postoperative radiograph showing graft containment and implant



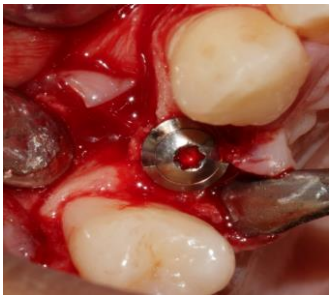
10-month postoperative cone-beam computed tomography showing functional implant and prosthesis.

Implant with 27.

Postoperative IOPA

sutures were placed. There was early implant failure within 2 months. 6 months after implant failure, clinical and radiographic evaluation was done again. Direct sinus lift was done by hydraulic method and longer implant was placed. 6 months after implant placement definitive prosthesis was given.

Preoperative view



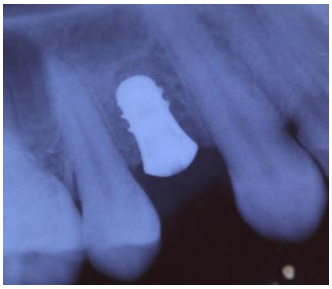
Buccal bone deficiency

DFDBA graft placed

CASE 2

A 26 year old female patient came with the chief complaint of missing teeth with 14. On examination missing 14. Past medical history was non-contributory. Implant placement was done with 14. Buccal bone deficiency was present so grafting was done with DFDBA graft with collagen membrane and

Collagen membrane placed

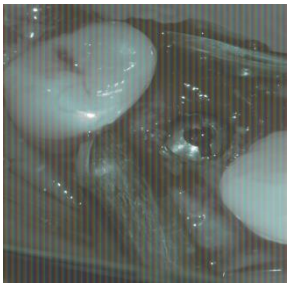


Postoperative IOPA after implant placement

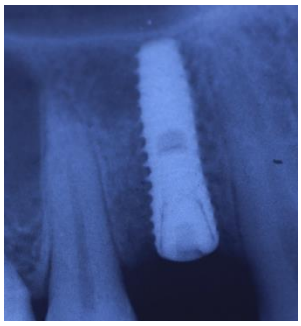
6 months after implant failure

Mid-crestal incision given

direct sinus lift by hydraulic method



Implant placement with 14



IOPA after 6 months

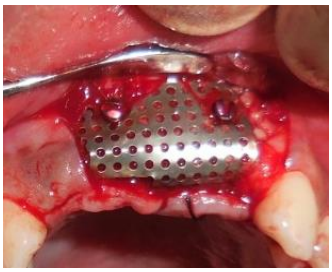
Definitive prosthesis with 14 (buccal and occlusal view)

CASE 3

A 38 year old male patient came with chief complaint of missing 11,12,21,22. Past medical history was non contributory. Horizontal ridge augmentation followed by implant placement was planned. Autogenous bone grafting was done and titanium mesh with tag screw was placed and suturing was done. Titanium mesh exposure was noted

after 2 weeks. Patient was advised chlorhexidine mouthwash and brushing twice a day. Complete closure was noticed after 6 months. Implant placement followed by prosthesis was given.

Preoperative view



Horizontal ridge augmentation

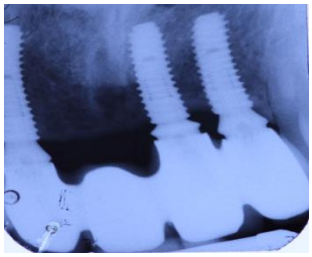
Suturing done

Titanium Mesh exposure after 2 weeks

Complete closure after 6 months

Implant placement done

definitive prosthesis



1 year followup

Case 4

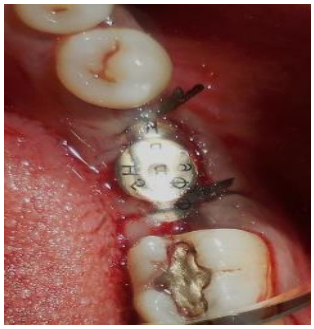
A 46 year old male patient came with the chief complaint of missing 46, 35,36. Implant placement with horizontal ridge augmentation was planned. Titanium mesh exposure was seen after one week. Patient was advised cleaning of that area and chlorhexidine mouthwash. 6 months post surgical titanium mesh was exposed but tissue around it was not inflamed. Successful implant placement was done.

Deficient site augmented with Ti- mesh

Intra surgical

1 week post surgical

6 months postsurgical

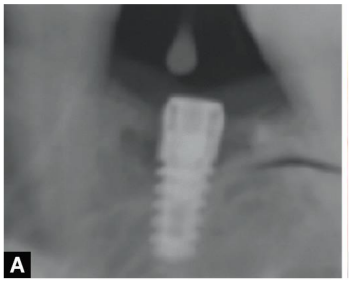


Implant placement with healing abutment done

Case 5:

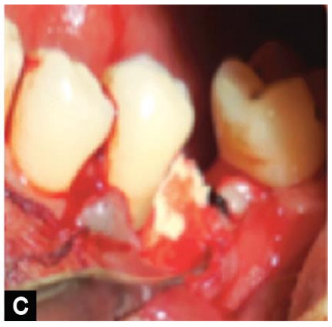
A 62-year-old male reported to the department with the complaint of missing teeth. Examination showed missing 36 with buccolingual and mesiodistal dimensions of 6.5 mm and 10.7 mm, respectively. A single-stage implant was placed in the 36 region. When the patient was recalled after 3 months for prosthetic rehabilitation, there was grade I mobility with the implant. On taking the intra-oral periapical radiograph, angular bone loss was noted in coronal one-third of the implant. This was managed with a regenerative procedure. After flap reflection, debridement was done, followed by DFDBA and chorion membrane placement. Instead of placing gingival former again, cover screw was placed and the patient was recalled after 6 months. There was a

decrease in radiolucency and complete absence of mobility after 6 months. Then, healing abutment was placed followed by impression and prosthesis.

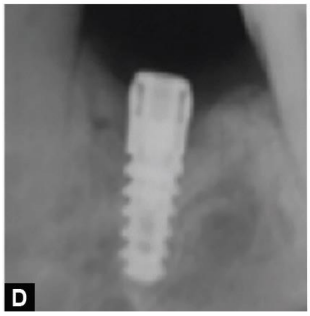


Radiolucency in coronal third of the implant

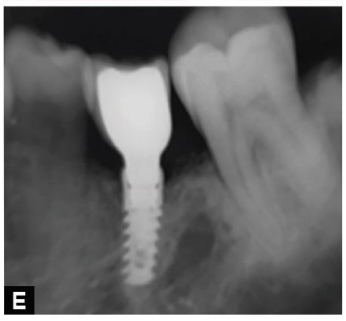
Flap reflection and debridement



Grafting with DFDBA and chorion membrane placement



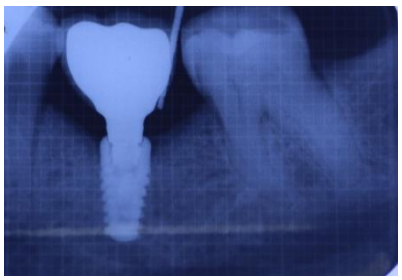
Decreased radiolucency around implant



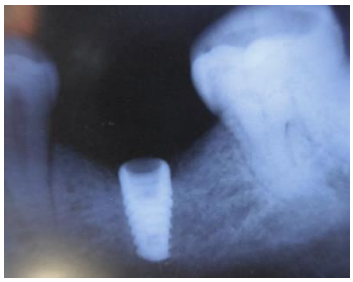
6 months postprosthesis delivery

CASE 6:

A 27 year old male patient complains of mobility of implant prosthesis with 36. History of screw retained metal ceramic prosthesis placement and implant loading 3 months ago. On examination fractured implant prosthesis with abutment screw which was unable to retrieve. Full thickness flap was reflected under LA and with the help of bone removal bur exposure of fixture platform was done. Guttering was done around the fixture and implant fixture was removed. The site was irrigated with saline and curetted to remove any debris. Grafting was done in the created bone defect with FDBA graft followed by PRF membrane placement. Suturing was done and patient is under folllowup.



Preoperative IOPA



3 months after loading, Implant with Fractured abutment screw, which was unable to retrieve

Fractured Implant

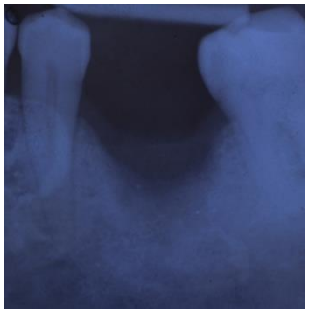
Exposure of the fixture platform

Guttering had been done around fixture

Fixture removal done

FDBA & PRF placement in the created bone defect

Suturing of the site



2 months postoperative IOPA

4 months postoperative IOPA

DISCUSSION

With respect to the above-mentioned complications, a light is thrown upon the possible etiologies and ways to prevent them.

For preventing sinus perforation, following points should be remembered[2]: (1) adequate screening of the sinus and predetermining the sinus health, (2) presence of sinus septae, oblique sinus floor, and widened sinus are anatomical concerns that increase the risk of sinus perforation, (3) in posterior maxilla with poor bone quality, undersized drilling technique should be considered to improve primary stability and (4) use of adjustable stops on osteotomes when infracturing the sinus floor to limit apical penetration. But in spite of the best precautions, perforations can happen and perforation repair is always an option.

Time required for the wound healing is related to the gap between tissue wound margins. Therefore, perfect adaptation will allow earlier suture removal and prevent incision line opening. Wound support is only needed until the healing process has progressed to such an extent that the tissue can withstand functional forces.[3] Peri-implant infections are generally classified as peri-implant mucositis and peri-implantitis depending on the severity. Peri-implant mucositis is defined as a reversible inflammatory reaction in the soft tissues surrounding an implant. Peri-implantitis is an inflammatory reaction with loss of supporting bone in the tissues surrounding an implant.[4]

Peri-implant bone loss at stage II may occur occasionally due to crestal bone trauma during surgery, excess torque from implant insertion, etc. Depending on the amount of bone loss, various treatments can be rendered. For vertical bone loss, if defect depth is <3 mm osteoplasty can be done and if vertical defect depth >3 mm, grafting and use of barrier membrane is advocated.[5]

Kreissl et al. found the incidence of abutment screw fracture to be 3.9 percent and that of screw loosening to be at 6.7 percent.[6] There may be various reasons for the abutment screw fracture. This can be managed by different techniques—they can be retrieved with the help of scalers,[7] small round bur and handpiece,[7] and reverse tapping rotary instruments.[8] Management of screw fracture is difficult many a times. Various causes for screw loosening and subsequent screw fracture are excursive contact, off-axis centric contacts (angled abutments or wide occlusal table), interproximal contacts, cantilever contacts, etc.[9] So utmost care needs to be taken to check all these factors.

Conclusion

With the advent of implantology as an emerging prosthetic option in dentistry, complications are also increasing day by day. So, the success of an implantologist does not lie in just the placement of implant but it lies also in managing the complications.

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DEPARTMENT OF ORAL AND MAXILLOFACIAL SURGERY

An in-vitro evaluation of a novel design of miniplate for fixation of fracture segments in the transition zone of parasymphysis-body region of mandible using finite element analysis

By- Dr. Hema Anukula

First year Postgraduate student

Department of Oral and Maxillofacial Surgery

NOVEL DESIGN OF MINIPLATE FOR FIXATION OF FRACTURES AT TRANSITION ZONE OF PARASYMPHYSIS - BODY REGION OF MANDIBLE - A CLINICAL RANDOMISED STUDY

By- Dr. Mahesh Pund

First year postgraduate

Department of Oral and Maxillofacial Surgery

IS ANTIPLATELET THERAPY A RISK FACTOR FOR EXTRACTION OF TOOTH?

By- Dr. Shramapurna K. Karemore

First year Postgraduate student

Department of Oral and Maxillofacial Surgery

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By- Dr. Amit Bhawalkar

Second year Postgraduate student

Department of Oral and Maxillofacial Surgery

AN ALGORITHM FOR FACIAL ASYMMETRY CORRECTION IN ADULT TMJ ANKYLOSIS PATIENTS A CLINICAL STUDY

By- Dr. Subodh Purohit

Second year Postgraduate student

Department of Oral and Maxillofacial Surgery

QUALITATIVE ASSESEMENT OF NEWLY FORMED BONE AFTER DISTRACTION OSTEOGENESIS OF MANDIBLE IN PATIENTS WITH FACIAL ASYMMETRY USING 3 DIMENSIONAL COMPUTED TOMOGRAPHY

By- Dr. Bhavna Valvi

Third year Postgraduate student

Department of Oral and Maxillofacial Surgery

All the above have been accepted as articles in National/International Journals.

DEPT OF CONSERVATIVE DENTISTRY AND ENDODONTICS

AESTEHTIC DENTISTRY

Dept of Conservative dentistry

Dr Neha Patil

Postgraduate student

With an ever growing demand and compliance to esthetic dentistry, a change in an outlook to restorations has occurred, giving importance to biomimetics [1] . Esthetic dentistry involves an interplay and compatible integration of material selection

INTRODUCTION

One of the main goals of dental treatment is to mimic teeth and design smiles in a most natural and aesthetic manner, based on the individual and specific needs of the patient. Possibilities to reach that goal have significantly improved over the last decade through new and specific treatment modalities, steadily enhanced and more aesthetic dental materials, and novel techniques and technologies. These restorations have included both anterior and posterior treatment modalities applied directly and indirectly. With a growing awareness on the part of many patients of the possible cosmetic treatment alternatives came the desire for aesthetic, metal-free, durable restorations. Today's dental restoration is consolidated around three mainstays: the use of non- metallic materials, such as composite resins and ceramics; adhesion to dental structures; and the achievement of a natural cosmetic look. The level of aesthetic requirement in restorations has risen spectacularly in recent years, and this has made it necessary for dentistry professionals to explore this field in order to satisfy the existing social demand in this area.

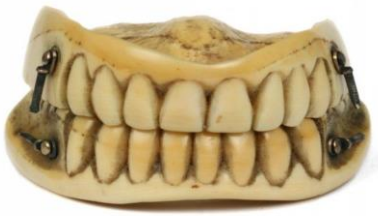
EVOLUTION OF AESTHETIC DENTISTRY

In 700 B.C.,the Etruscans made their dentures with :

- Ivory & bone,
- Human and animal teeth
- Gold crowns and dental bridges.

In the 1100 and 1200s, barbers performed dental procedures including

- Whitening
- Filling
- Dental surgery.



In the 1700s, human teeth began to be used as dental implants.

Metal inserts replaced the human teeth in dental implants in the 1800s.

The first porcelain dentures were created in 1770 by Alexis Duchateau.

In the 1950s, the traditional porcelain crowns were first fused with metal.

During the late 1900s, bleaching, veneers, and implants were developed.

ARTISTIC ELEMENTS

Regardless of the result desired, certain basic artistic elements must be considered to ensure an optimally esthetic result. In conservative esthetic dentistry these include:

1. Shape or form
2. Symmetry and proportionality
3. Position and alignment
4. Surface texture
5. Color
6. Translucency

SHAPE OR FORM

Some or all of these elements are common to virtually every conservative esthetic dental procedure; therefore a basic knowledge and understanding of these artistic elements is required to attain esthetic results consistently.

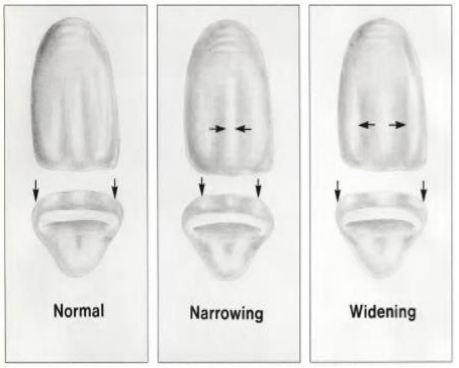
When viewing the clinical crown of an incisor from a facial (or lingual) position, the crown outline is trapezoidal. However, subtle variations in shape and contour produce very different appearances. For instance, rounded incisal angles, open incisal and facial embrasures and softened facial line angles typically characterize a youthful, feminine smile. A more masculine smile, or a smile characteristic of an older individual having experienced attrition due to aging, typically exhibits incisal embrasures with more closed and prominent (i.e., less rounded) incisal angles.

Although less extensive, restoring an individual tooth rather than all anterior teeth simultaneously may, in fact, require greater artistic ability. When treating an isolated tooth, however, the success of the result is largely determined by how well the restored tooth esthetically matches the surrounding natural teeth. Illusions of shape also play a significant role in dental esthetics. The border outline of an anterior tooth (i.e., facial view) is primarily two-dimensional (i.e., length and width). However, the third dimension of depth is critical in creating illusions, especially those of apparent width and length.

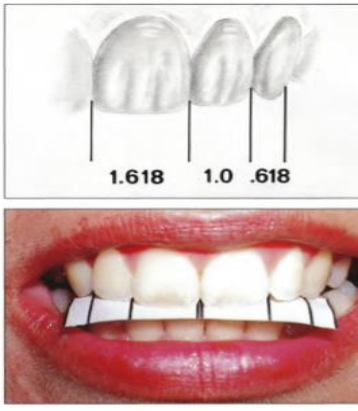
Moreover, the apparent size of a tooth can be changed by altering the position of facial prominences or heights of contour without changing the actual dimension of the tooth. Although more difficult, the apparent length of teeth also can be changed by illusion. When compared with normal tooth contours, a tooth can be made to appear shorter by emphasizing the horizontal elements, such as gingival perikymata, and by positioning the gingival height of contour further incisally. The opposite tenets are true for increasing the apparent length of a tooth.

SYMMETRY AND PROPORTIONALITY

The overall esthetic appearance of a human smile is largely governed by the symmetry and proportionality of the teeth that constitute the smile. Asymmetric teeth or teeth that are out of proportion to the surrounding teeth disrupt the sense of balance and harmony essential for optimal esthetics. Assuming the teeth are of normal alignment (i.e., rotations or faciolingual positional defects are not present), dental symmetry can be maintained if the sizes of the contralateral teeth are equivalent. A dental caliper should be used in conjunction with any conservative esthetic dental procedure that will alter the mesiodistal dimension of the teeth.



When dealing with restorations involving the midline, particular attention also must be afforded to incisal and gingival embrasure form; the mesial contours of both central incisors must be mirror images of one another to ensure an optimally symmetric and esthetic result. The quality of proportionality is relative and varies greatly depending on other factors (e.g., tooth position, tooth alignment, arch form, configuration of the smile). However, one



long-accepted theorem of the relative proportionality of maxillary anterior teeth typically visible in a smile involves the concept of the golden proportion. 4 Based on this formula a smile, when viewed from the front, is considered to be esthetically pleasing if each tooth in that smile (starting from the midline) is approximately 60% of the size of the tooth immediately mesial to it. Although this theorem is not the absolute determinant of dental esthetics, it does provide a practical and proven guide for establishing proportionality when restoring anterior teeth.

POSITION AND ALIGNMENT

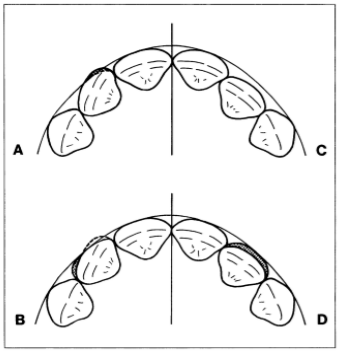
The overall harmony and balance of a smile depend largely on proper position of teeth and their alignment in the arch. Malposed or rotated teeth disrupt the arch form and may interfere with the apparent relative proportions of the teeth. Orthodontic treatment of such defects should always be considered, especially if other positional or malocclusion problems exist in the mouth. However, if orthodontic treatment is either impractical or unaffordable, minor positional defects often can be treated with composite augmentation or full facial veneers indirectly made from composite or porcelain.

Minor rotations can be corrected by reducing the enamel in the area of prominence and augmenting the deficient area with composite material. If the rotation is to be treated with an indirectly fabricated composite or porcelain veneer, an intraenamel preparation is recommended with greater reduction provided in the area of prominence.

Malposed teeth are treated in a similar manner. Teeth in mild linguoversion can be treated by augmentation with full facial veneers either placed directly with composite or made indirectly from processed composite or porcelain

SURFACE TEXTURE

The character and individuality of teeth are largely determined by the surface texture and characteristics that exist. Realistic restorations closely mimic the subtle areas of stippling, concavity, and convexity that are typically present on natural teeth. Young teeth characteristically exhibit significant surface characterization, whereas teeth in older individuals tend to possess a smoother surface texture caused by abrasional wear. The surfaces of natural teeth typically break up light and reflect it in many directions. The restored areas of teeth should reflect light in a similar manner to unrestored adjacent surfaces.



COLOR

It is an area in which numerous interdependent factors exist, all of which contribute to the final esthetic outcome of the restoration. Teeth are typically composed of a multitude of colors. A gradation of color usually occurs from gingival to incisal, with the gingival region being typically darker because of thinner enamel. The use of several different shades of restorative material may be required to esthetically restore a tooth. Young patients with thick enamel characteristically exhibit lighter teeth. Moreover, patients with darker complexions usually will appear to have lighter teeth because of the contrast that exists between the teeth and surrounding facial structures.

Color changes associated with aging also occur, primarily owing to wear. As the facial enamel is worn away, the underlying dentin becomes more apparent, resulting in a darker tooth. Incisal edges are often darker because of thinning of the enamel or exposure of the dentin because of normal attrition. Cervical areas also tend to darken because of abrasion. Accurate shade selection is best attained by applying and curing a small amount of the composite restorative material in the area of the tooth anticipated for restoration. Shade selection also should be determined before isolating the teeth to avoid color variations that can occur as a result of drying and dehydration of the teeth.

TRANSLUCENCY

Translucency also affects the esthetic quality of the restoration. The degree of translucency is related to how deeply light penetrates into the tooth or restoration before it is reflected outward. Shallow penetration of light often results in a loss of esthetic vitality. Although opaque resin media can mask the underlying stain, a loss of esthetic vitality usually results because of reduced light penetration.

Illusions of translucency also can be created to enhance the realism of a restoration. Color modifiers (also referred to as tints) can be used to achieve apparent translucency and tone down bright stains or characterize a restoration. Color modifiers also can be incorporated in the restoration to simulate maverick colors, check lines, or surface spots for further characterization.

DISCUSSION

Although an understanding of basic artistic elements is imperative to esthetic restorations, certain clinical considerations must be addressed concomitantly to ensure the overall quality of the restoration. In addition to being esthetic, restorations also must be functional. The occlusion must always be assessed before any conservative esthetic procedure. Anterior guidance, in particular, must be maintained and occlusal harmony ensured when treating areas involved in occlusion. Another requirement of all conservative esthetic restorations is that they possess physiologic contours that promote good gingival health. Particular care must be taken in all treatments to finish gingival areas of the restoration adequately and to remove any gingival excess of material.

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ESTHETIC CONSERVATIVE DENTISTRY

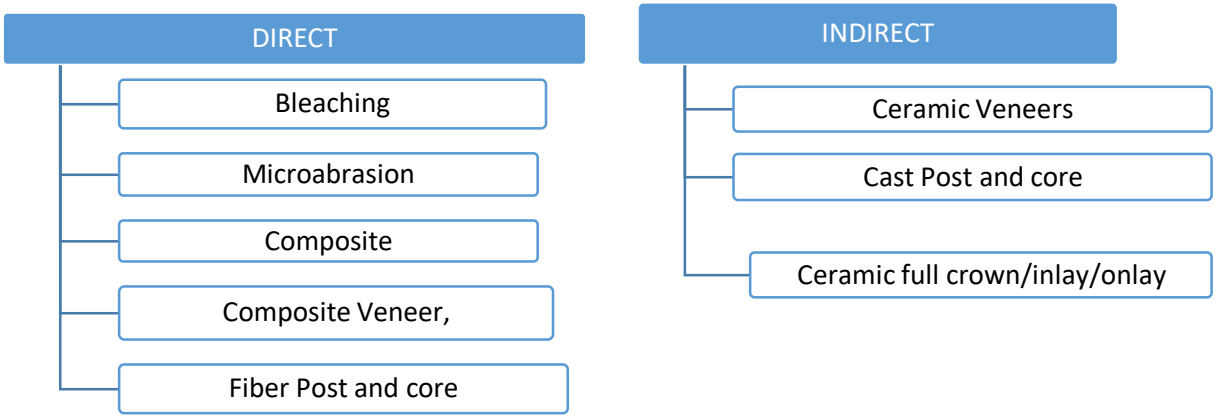
Dept of Conservative dentistry

Dr Aayushi Baghele

Postgraduate student

With an ever growing demand and compliance to esthetic dentistry, a change in an outlook to restorations has occurred, giving importance to biomimetics [1] . Esthetic dentistry involves an interplay and compatible integration of material selection and smile rehabilitation [2] . In mode to all dentition, the maxillary incisors, primarily the central incisors are the visual focal point for the smile, keeping in mind it is symmetry and dominance [3] . The common complaints given by patients related to esthetics are caries, trauma, anatomic alterations, discoloration/staining, malocclusion or hypoplastic problems [4]

Esthetic Restorative Procedure can be divided as follow:



1) *Bleaching:*

Bleaching is a treatment modality involving an oxidative chemical that alters the light-absorbing and/or light-reflecting nature of a material structure, thereby increasing its perception of whiteness.

Aesthetics of the teeth is of great importance to patients, including tooth colour.

- *Dentists began using hydrogen peroxide since 1900s.*
- *In 1989, Heyward and Heymann came up with the first at-home bleaching trays.*

Type	*Agent Used*

In-office nonvital bleaching	*In-office vital bleaching*	*3*
Walking bleach	*Dentist prescribed home applied technique*	*1*

Olga Polydorou at al concluded that bleaching with 38% hydrogen peroxide does not reduce the microhardness of the restorative materials tested. Therefore, no replacement of restorations is required after bleaching [5].

2) *Microabrasion:*

In 1986, Croll & Cavanaugh introduced pumice with HCL acid in a paste form for removal of superficial fluorosis stai

Richard at al, study showed that enamel microabrasion could remove stains from within the outermost layer of tooth enamel, thereby improving the appearance of the teeth.

Macroabrasion

- *An alternative technique.*
- *12- fluted composite finishing bur/fine grit finishing diamond in a high speed handpiece is used.*
- *Use light, intermittent pressure.*
- *Air- water spray to keep the teeth hydrated*

Indication
• *Localized superficial white spots* • Brown stains • Postorthodontic demineralization • Localized hypoplasia due to infection or trauma. • Idiopathic hypoplasia where the discolorations is outer enamel layer.

Monteiro P at al said that The macroabrasion procedures should be placed as a conservative option in the treatment of white lesions in the anterior teeth.With a conservative procedure, and using a simple restorative technique we can restore the natural aesthetics to the affected teeth [6].

- Direct composite resin possesses similar physical and mechanical properties to tooth structure and increases the longetivity of the treatment [7] . Due to the polychromatic nature of the natural tooth, layering technique is indicated for anterior composite restoration as it enables complete light curing of resin increment, mimics naural tooth esthethics and reduces the polymerization stresses [4] . Longetivity of the restoration along with its esthethic content is of paramount importance and is affected by several parameters such as type of substrate, location and size of restoration, the restorative material being used and the conditions provided. Special considerations should be given to the bonding procedure along with proper isolation as any compromise in its context would lead to fracture of the rest

Composite Veneers

Veneer anterior teeth is well established technique, which brought to dentistry by Dr. Pincus as early as 1937, it become popular in the mid 1970s. using three different approaches: direct bonding using resin composite, prefabricated composite

Composite Restoration

- *In 1962, Bowen introduced filled resin termed as composite.*
- Direct composite restorations are an excellent choice of restoration for anterior dentition. It presents with several advantages over indirect restorations such as its minimal to no-tooth preparation, economical and can be done in a single appointment.

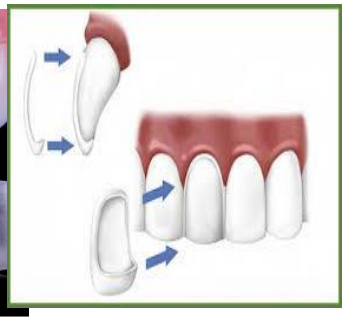
veneer and indirect custom- made porcelain veneer[7].

- *Layer of tooth colored material applied to a tooth to restore localized/generalized defects & intrinsic discoloration.*

Indications:-

- *Malformed facial surface*
- *Discolored facial surface*
- *Abraded facial surface*
- *Eroded facial surface*
- *Faulty restoration*

Types of esthetic veneers



Partial full veneers

veneers

Accomplished by

1. Direct technique

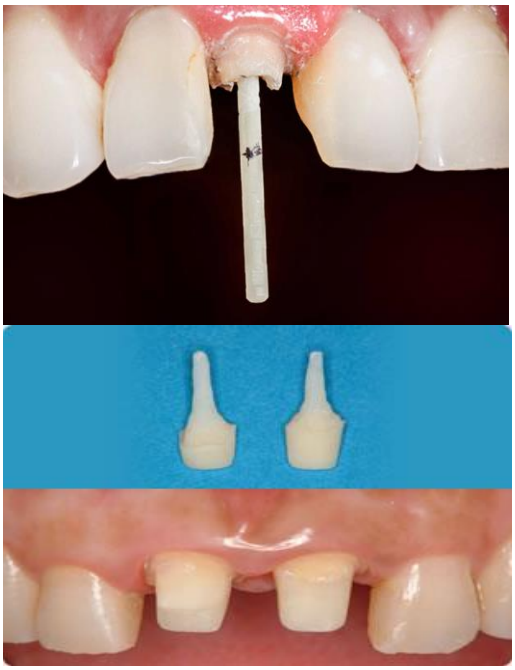
2. Indirect technique

FULL CROWN/INLAY/ONLAY

During the last 30 years ,evolution of adhesive philosophy in dentistry and the high bonding performance achieved by modern adhesive systems have gradually changed the dogma of devitalized tooth should be restored with post, core and crown. Adhesion ensures sufficient material retention without the need of aggressive macroretentive technique [8]. The endocrown is a total porcelain crown fixed to a devitalized tooth, which is anchored to the internal portion of pulp chamber and cavity margins, thus obtaining macromechanical retention (provided by the pulpal walls) and microretention (by using adhesive cementation) [9]. Onlay is an extra-coronal restoration usually involving same area as inlay restoration and portion of outer cuspal slope, it is indicated in cases of steep cuspal inclines as wedging force tends to direct forces not parallel to the long axis of tooth [10]. The versatile inlay and onlay restorations require meticulous care in preparation, but when properly designed are extremely useful as durable restorations, able to withstand occlusal forces and more compatible with soft tissues as can be seen in gingival and subgingival margins [10]. New materials and therapeutic options based entirely on adhesion are nowadays available as direct composite and endocrown restorations. They allow performing a more conservative, faster and less expensive dental treatment. With the advent of adhesive dentistry, it has become acceptable to restore teeth with extensive coronal destruction by performing endocrowns without using posts and by using extension of the pulp chamber as a retentive resource [10]. These restorative procedures were made possible by the development of acid etchable ceramics (such as leucite and lithium disilicate based ceramics), dentinal adhesives and resin cements

Post And Core

When restoring severely damaged teeth, a cast metal post and core is traditionally used to provide the necessary retention for a subsequent restoration. According to a 10-year retrospective study by Balkenhol et al,[12] the fit of a cast post and core to the post space significantly influences the survival probability. Prefabricated glass fiber posts have good mechanical and biocompatibility properties [13,14] and a desirable shade. However, their diameters cannot be customized to adapt to individual post space preparations. Furthermore, most glass fiber posts need a separate composite resin core, and the weak interface between the resin core and fiber post may cause a higher restoration failure rate.



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SMILE ENHANCEMENT THE CONSERVATIVE WAY: TOOTH WHITENING PROCEDURE

Dept of Conservative dentistry

Dr Benita Fernandez

Postgraduate student

Dr. Benita Fernandes, Dr. M.M. Warhadpande, Dr. S Radke

Department of Conservative Dentistry & Endodontics, Government Dental College & Hospital, Nagpur.

Abstract: Discoloration of tooth is a common esthetic problem caused by either intrinsic or extrinsic factor. The normal colour of such a tooth can be easily restored by decolorizing the stain with a powerful oxidizing agent such as 35% hydrogen peroxide which is directly placed on the surfaces of the tooth to be treated. The bleaching agent is available commercially in the form of a gel. This process involves the application of light to activate the bleaching agent. Effective results were obtained when the process of bleaching was correctively performed on the patient. In today's world of immediate gratification, in-office bleaching is one of the most requested procedures in many dental offices, a great way to get a fast and immediate change in the color of their teeth. This article throws a light on how we have achieved normal tooth colour by using 35% Hydrogen peroxide in the following case series.

Keywords: Non-vital tooth bleaching,Vital tooth bleaching, Bleaching agent, Hydrogen peroxide, Fluorosis.

Introduction

The demand for esthetic dentistry has increased continuously and the smile has become an integral part of social attractiveness of a person

Tooth discolouration of is a common esthetic problem caused by either intrinsic or extrinsic factor. Bleaching is the most conservative treatment option when compared to other restorative techniques used to treat the tooth discolouration.[[1]] There are two main types of bleaching procedures - non-vital bleaching and vital bleaching.

The most common type of vital tooth whitening uses a gel like whitening solution applied directly to the tooth surface like hydrogen peroxide, sodium perborate, carbamide peroxide followed by a heating up of the gel. Vital bleaching is an in-office procedure which uses high concentration of hydrogen peroxide and often referred to as "one hour bleaching." [[i]]

Hydrogen peroxide (H_2O_2) is a chemical substance with high oxidative potential. It is highly unstable and they dissociate into water, oxygen and free radicals when they come in contact with the tissues, the latter accounting for the observed bleaching effect due to their ability to oxidize organic pigments. It is known that the diffusion of H_2O_2 through the dentin depends on the concentration of the gel, the period of time that the agent is in contact with the tooth and the thickness of dental structure.[[ii]] Final outcome of bleaching influenced by patient's age original shade of the tooth colour, concentration of bleaching agent, time for which the bleaching agent is exposed to the tooth structure.[4] Different light sources can be used for in-office bleaching for heating up

[[1]] Presoto CD, Bortolatto JF, Carvalho PP, Trevisan TC, Floros MC, Junior OB. New parameter for in-office dental bleaching. Case reports in dentistry. 2016 Jan 1;2016.

the gel to accelerate the dissociation of H_2O_2 into oxygen radicals such as halogen lamps, light emitting diode, plasma arc lamps and lasers with different wavelengths.[2] In this case series in-office bleaching was performed using 35% H_2O_2 and light emitting diode as the light source.

Case reports

Case 1: A 18 year old male reported to the Department of Conservative Dentistry and Endodontics, Government Dental College & Hospital with discolored maxillary anterior teeth. After clinical examination the case was diagnosed that the discolouration of the tooth in this patient was due to both extrinsic and intrinsic stains. The extrinsic yellowish stains observed in the patient were due to high consumption of tea and the intrinsic brownish discolouration was due to mild to moderate fluorosis according to Dean's fluorosis index. (**Figure 1a**) In office bleaching procedure was then explained to the patient. After taking his consent the treatment was performed.

Figure 1a: Preoperative clinical photograph

After thorough oral prophylaxis the superficial stains were removed using dental pumice fine grit (Dharma Research) and a rubber cup (Oro Prophy Cups) followed by in-office tooth bleaching to lighten the discoloration. The preoperative shades were assessed using the shade guide (VITA classical shade guide, VITA Zahnfabrik). Mucosa was protected by application of Vaseline and the teeth were isolated with a medium dental rubber dam. (Hygenic, Coltène/Whaledent GmbH, Langenau, Germany) (**Figure 1b**) A 35% hydrogen peroxide gel (SDI Pola Office, Australia) was evenly applied on the buccal surfaces of the teeth. (**Figure 1c, Figure 1d**) Four cycles of eight minutes each were carried out with alternate light curing (Allure, LED light) to enhance the bleaching process. All the instructions of the manufacturer were followed. The bleaching agent was then wiped off using a gauze, mucosal protectant was removed and the patient was asked to rinse. A sodium fluoride and potassium nitrate gel (UltraEZ, Ultradent) was then applied evenly onto the bleached teeth. The patient follow up was done after 1 week. (**Figure 1e**)

Figure 1b: Rubber dam application

Figure 1c: Application of Bleaching agent

Figure 1d: Bleaching agent

Figure 1e: Postoperative clinical photograph

Case 2: A 32 yr old female patient came to the Department of Conservative Dentistry & Endodontics, Government Dental College & Hospital, Nagpur with a chief complaint of discoloured upper left front tooth. (**Figure 2a**) The patient presented a history of trauma to the tooth 15 years ago. With time the discolouration of the tooth increased and so the patient started feeling conscious about the unsightly appearance of the tooth and therefore seeked for improvement in the esthetic appearance. The treatment followed in this case was root canal therapy followed by inside outside bleaching using 35% hydrogen peroxide.

Figure 2a: Preoperative clinical photograph

Patient was familiarized with the possible causes of discolouration, the procedure to be followed, the expected outcome and the possibility of future re discolouration. Thorough oral prophylaxis was done and preclinical photographs were taken. Root canal treatment was performed for the maxillary left central incisor. In the next appointment, excess gutta percha was removed from the excess cavity, and it was cleaned. (**Figure 2b**) The height of clinical crown was measured using periodontal probe (Hu Friedy 15 UNC periodontal probe) and it was made sure that Gutta-percha is removed approximately 2 mm below the Cemento-enamel junction. Light cured glass ionomer (GC Gold Label 2, Light Cured Universal Restorative) barrier of 2 mm was placed over the gutta-percha and then cured using an LED light curing unit (Allure). Isolation done with extra heavy dental rubber dam, (Hygenic, Coltène/Whaledent GmbH, Langenau, Germany) 35% hydrogen peroxide gel (SDI Pola Office, Australia) was placed into the pulp chamber (**Figure 2c**) and applied onto the buccal surface with an applicator tip for 30 mintues. (**Figure 2d**) Alternate light curing (Allure, LED) was done to enhance the bleaching agent. (**Figure 2e**)

After 4 non-vital bleaching sessions, a complete metamorphosis of the discoloured tooth was evident and the present colour was comparable to that of the adjacent teeth. Post obturation restoration was done using composite resin (tertic N Ceram, Vivadent, Ivolcar). The patient was followed-up after 1 week. (**Figure 2f**)

Figure 2b: Post obturation radiograph

Figure 2c: Application of bleaching agent into the pulp chamber

Figure 2d: Application of bleaching agent onto tooth surface

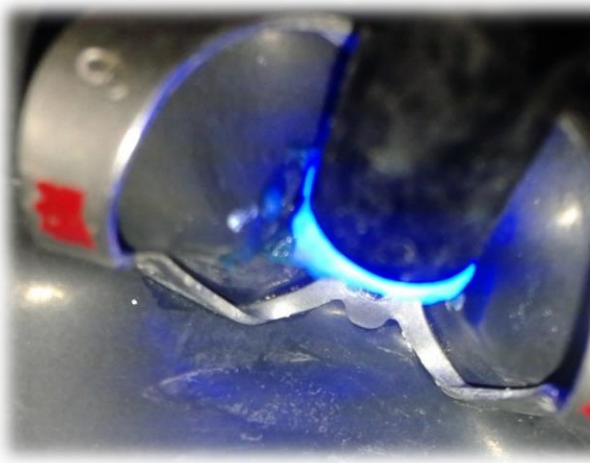

Figure 2e: LED light activation of bleaching agent

Figure 2f: Post operative clinical photograph

Discussion

Although a wide arena of esthetic materials are available for us today for the management of discoloured teeth, bleaching still remains a viable and a conservative option in certain cases. A number of factors play an important role in deciding the treatment plan. The patient-related factors for a successful outcome are the patient's need, age, expectations and affordability. The clinician- related factors include the availability of bleaching materials and a thorough knowledge of the material science, including methodologies and techniques involved. [iii, iv]

In-office bleaching is the most commonly used method for the removal of stains throughout the arch or even treating specific areas of a single tooth (such as in some types of fluorosis). The dentist is in complete control of the procedure. As a result the treatment procedure can be continued or terminated at any point in time. [v, vi] In-office bleaching is a fast process and the results are evident even after a single visit. Many patients prefer in-office bleaching as it requires less participation from on their part. [vii]

The indications of in-office bleaching are as follows: [viii]

- Developmental or acquired stains.
- Stains in enamel and dentin.
- For removing yellow brown stains.

- Yellowing of teeth due to aging.
- For blending white color changes.
- Mild to moderate tetracycline changes.

The contra-indications of in-office bleaching include the following: [9]

- Tetracycline staining.
- Pitting hypoplasia.
- Teeth with deep and surface cracks and fracture lines.
- Teeth with large anterior restorations.
- Periapical pathology.
- Teeth exhibiting extreme sensitivity to heat, cold, touch and sweetness.
- Patients who smoke.
- Patients with unrealistic expectations about the anticipated esthetic result. [ix]
- Teeth with excessive tooth surface loss due to attrition, abrasion and erosion

Nonvital bleaching also can be an esthetically pleasing and minimally invasive option for young patients rather than a complete coronal coverage. Intracoronal bleaching of nonvital teeth involves the use of chemical agents within the coronal portion of an endodontically treated tooth to remove tooth discoloration. [x] It may be successfully carried out at various times, even many years after root canal therapy and discoloration. The successful outcome depends mainly on the etiology, correct diagnosis and proper selection of bleaching technique. Inside outside bleaching was preferred as it requires less chairtime and is safer and more comfortable for the patient as it carried out in the clinic. [xi]

The indications of nonvital bleaching include the following: [9]

- Discoloration of pulp chamber origin.
- Dentin discolorations.
- Discolorations not amenable to extracoronal bleaching.

The contra-indications of nonvital bleaching include the following: [9]

- Superficial enamel discoloration.
- Defective enamel formation.
- Severe dentin loss.
- Presence of caries.
- Discolored composites.

Various brands of bleaching agents with different concentrations are available in the market. Here in this case Pola office bleaching used and it has the most promising outcome. It consist of 35% hydrogen peroxide alongwith potassium nitrate.

The understood mechanism of bleaching by H_2O_2 is diffusion of free radicals produced by H_2O_2 through enamel and dentin, which interact with the pigment and cause whitening effect. The free radicals break down the double between the pigment molecules and change its configuration, because of change in configuration optical properties of tooth get change and tooth appears whiter. [11] Besides action by radicals, there few another factor responsible for tooth whitening, one is cleaning and polishing before and after bleaching procedure and dehydration of tooth by bleaching agent makes tooth whiter. [xii]

Final outcome of bleaching influenced by patients age, original shade of tooth color, age, concentration of bleaching agent, time for which bleaching agent exposed to tooth surface etc. [xiii]

Certain side effects and problems associated with bleaching should always be kept in mind whilst performing the procedure. [xiv]

- Gingival and soft tissue irritation

Strong concentrations of 35% hydrogen peroxide can cause soft tissue damage, gingival ulceration and skin burns. Normally these burns appear as a white lesion in the area, followed by a red rim. These disappear after a few minutes, heal quickly and do not cause any permanent damage. If such lesions occur, the patient should be told, shown and reassured. Therefore, a gingival barrier is mandatory. [9]

- Altered taste/sensation

Some patients report a metallic taste sensation immediately after bleaching; however, this normally disappears after few hours. [9]

- Tooth sensitivity

If this has occurred, the patient should be reassured that this is a common side effect and will disappear after bleaching. Patients should be reassured that the side effects are minor and transient and will disappear after the completion of treatment. [9] Dentists may also wish to consider prescribing NSAIDs prior to treatment since post-treatment sensitivity is unpredictable. [xv]

High concentration bleaching agent has an adverse effect on underlying pulp tissue. Many in vitro studies have shown that penetration of bleaching into the pulp chamber when bleaching agent was exposed to tooth surface for 60 mins. Hanks et al. concluded that bleaching agent penetration into pulp chamber depends on the original concentration of the bleaching agent and duration for which it has been exposed to the tooth surface, he also concluded that it took around 15 mins for bleaching agent to reach into the pulp chamber. [xvi] As molecular size and weight of peroxide, molecule is very low and has the ability to denature the protein present in dentin that's why it moves easily through dentinal tubules and reach to the pulp chamber. But in vivo studied shows a reverse result of in vitro studies. In vivo studies by Cohen and Robertson shows either no or very minimal inflammation of pulp when exposed to 35% hydrogen peroxide. The protective mechanism of pulp against bleaching agent is by breakdown of peroxide molecule by enzyme peroxidase and catalase. Anderson reported heameoxygenase 1 enzyme is protective enzyme present in endothelial cell and odontoblasts present near bleached enamel and prevents the diffusion of bleaching molecule into the pulp chamber. Another factor responsible for the diffusion of bleaching molecule into the pulp chamber is positive pressure within the pulp chamber and osmotic pressure of the bleaching agent. [xvii]

- External cervical resorption

Heithersay analysed cervical resorption and reported that 3.9% was caused by intracoronal bleaching. [xviii] The combination of bleaching and history of trauma is the most important predisposing factor for cervical resorption. [xix] Several studies reporting on long-term follow-up evaluations show an association between external resorption and bleaching of nonvital teeth, even many years after bleaching. Animal studies have shown histologic evidence of resorption after 3 months of bleaching. [xx, xxi] However, after 1 month no changes were detected. Cervical resorption is mostly asymptomatic and is usually detected only through routine radiographs. [xxii] Sometimes swelling of the papilla or percussion sensitivity can be observed.

A follow-up radiograph of the bleached tooth within the first year after treatment is recommended to diagnose possible cervical resorption as early as possible. Treatment prognosis depends mainly on the extent of the resorption process. The extent of

resorption serves as a guide for the clinician in selecting the correct treatment. [xxiii] Extraction is often inevitable in cases of severe external root resorption and when the lesion cannot be controlled. [xxiv,xxv] In these cases an implant-supported restoration is an acceptable treatment. If resorption occurs, Friedman et al [xxvi] suggested that calcium hydroxide recalcification treatment should be attempted. Clinical cases have shown that an intracoronal dressing with calcium hydroxide can sometimes prevent progression of external resorption. [xxvii, xxviii] Recalcification treatment will fail if there is communication between the resorption and the oral cavity. [xxix] In these cases, surgical repair should be considered. Cervical resorption can also be treated with a direct restoration after gaining surgical access to the defect. [xxx,xxxi,xxxii]

If recalcification or surgical repair is not feasible, or if the results of surgical repair are esthetically or periodontally unsatisfactory, the option of surgical crown lengthening combined with appropriate restorative treatment is still available. [xxxiii] If a lesion can be easily accessed, a limited labial flap might be raised to permit cleaning of the lesion, thus exposing sound tooth structure. Then, it is recommended to place 90% trichloroacetic acid on the affected margins to necrotize granulation tissue. The area of resorption should be restored with an appropriate material, dictated mostly by esthetic demands. [xxxiv] In severe cases in which the lesion is not only subgingival but subcrestal as well, a labial flap must be raised to permit cleaning of the lesion, exposing sound tooth structure and sealing with a temporary filling material. After this initial treatment, it is recommended to use (rapid) orthodontic tooth extrusion combined with fiberotomy followed by definitive restorative treatment. [xxxv,xxxvi,xxxvii] This treatment will result in a shorter root, potentially leading to an increase in tooth mobility. Loss of marginal attachment as result of crown lengthening is more detrimental than loss of an equivalent amount of root length by apical resorption or orthodontic extrusion. [xxxviii]

Conclusion

Based on the clinical results reported with professional tooth bleaching, it is a viable, esthetic treatment for the discolored dentition its conservative nature and little, if any, risk makes it an important part of an esthetic dentistry treatment plan.

In-office bleaching has gained a lot of popularity in the general public. Many patients are now aware that in-office bleaching is a procedure that many dentists offer and is a great way to get a fast and immediate change in the color of their teeth. In today's world of immediate gratification, in-office bleaching is one of the most requested procedures in many dental offices.

Restoring Fractured Anterior Tooth Using Direct Composite Restoration – Case Report

Dept of Conservative dentistry

Dr Kuntal Wagh

Postgraduate student

Introduction-

Anterior crown fractures are common form of injury that mainly affects children and adolescents. Uncomplicated crown fracture to the permanent teeth has an intense effect not only on the patient's appearance, but also on function and speech. (1) The predictable esthetic restoration of broken incisal edge of maxillary central incisors is a demanding and technique sensitive procedure. Its success is dependent on operator's skills and knowledge and also on adhering to a systematic and problem solving approach. A logical method is used to build up morphologically correct composite restorations by careful selection of composite shades, tints and opaquers.(2)

The worldwide prevalence of traumatic dental injuries ranges between 6%-37%. Dental trauma (DT) of the incisors and their supporting tissues, which is one of the most challenging dental emergency situations, requires immediate assessment and management due to psychological and physical reasons.(3)

The repair of tooth fracture with the help of crown and bridge requires high financial expenses, is more time consuming, needs multiple appointment therapy and is a less conservative approach. In the treatment plan the initial option considered should be the most conservative one that will achieve all the desired objectives of both the patient as well as the dentist.(4)

Direct composite restoration technique is minimally invasive, economical and successful in repairing tooth fracture with excellent longevity in carefully selected cases and with superior matching ability.(5) In the present article, an esthetic rehabilitation of fractured anterior teeth restored with direct composite resin is presented.

Case report -

A 14 years old male patient reported to OPD of department of Conservative Dentistry & Endodontics with a complaint of fracture in upper front teeth. Dental history revealed that he met with an accident 1 month back resulting in an injury. Extraoral examination revealed no significant findings. During the intra-oral examination, a class II Ellis fracture of right

maxillary central incisor was diagnosed. (Fig.1a&b) There was no other pathology associated with the injury. Mild calculus deposits were present but dental caries was not found. Intraoral periapical radiograph clearly shows enamel and dentin fracture without involvement of pulp in the teeth.

Root formation of 11 was complete with no periapical pathology. Neither the patient dex was used to make palatal shell with tooth 11.For this an alginate impression of upper jaw was taken. The cast was poured. Wax up of fractured tooth was done. Proper carving was done to simulated the anatomical features of natural tooth. Putty impression was made with addition silicon ((DMG silagum, Hamburg, Germany) & index was obtained.(Fig.2a&b)

Rubber dam isolation was done. Adaptation of putty index was checked. The enamel of flowable composite.(Fig.4a&b)

After light curing for 20 seconds, putty index was removed. The subsequent composite restoaration was done using packable composite (Ivoclar,vivadent) used in increments. The material was cured for 40 seconds on each surface.

During the finishing stage the contouring and gross reduction of the composite resin was performed with the help of variety of burs and diamond points. A composite finishing and polishing kit (Shofu kit) was also used for this purpose. Once the restoration was refined a final polishing was done with the polishing points. (Fig.5a&b) Follow up showed satisfactory results.

Discussion -

With further improvements in bonding chemistry, the success rate of composites is speculated to improve. A good polishing system including polishing paste, cups and wheels is recommended to achieve appropriate luster.(8)

Conclusion-

nor his parents was interested in irreversible and indirect treatment option but they are inclined to pursue immediate, more conservative restoration. To fully evaluate the case a visual assessment was performed and the patient's occlusion was analysed. Shade matching was done and A2 shade was selected for the case. Putty in

tooth 11 adjacent to fracture line was beveled.Tooth surface was etched for 40 seconds. Again the tooth was washed and dried using air-water syringe. The bonding agent was then applied to the prepared surface and light cured for 20 seconds. (Fig.3a,b,c&d)

Putty index was placed against the teeth and thin palatal shell was obtained using

Management of patient's with anterior tooth fracture provides great challenge to the clinicians both from a functional and an esthetic perceptive. Treatment objectives may vary depending on the age, socio-economic status of the patient and intraoral status at the time of treatment planning.

The composite resins provide satisfactory treatments results for even young and adult patients. The choice of resin composite should be focused on aspects related to the strength and aesthetics. Within this context, the composite layering is the key to obtaining esthetically successful restorations.(6)

According to Nahsan et al, young teeth show a naturally high value and thus require resins with such characteristics; in consequence, the reproduction of enamel should be done with composite resins that presents transparent characteristic

The recent advancement in composite materials enables us to reproduce the natural anatomic form and function in a beautifully conservative manner. When we implement conservative approach techniques we are in fact allowing for the possibility of further cosmetic options in

the future, which is particularly important for a young patient.

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Fig.1a Preoperative clinical photograph

Fig.1b Preoperative clinical photograph

Fig.2a Making putty index

Fig.2b Preoperative clinical photograph

Fig.4b Palatal shell made

Fig.3a Rubber dam isolation

Fig.3b Application of Etchant

Fig.5a Postoperative clinical photograph

Fig.3c Application of Bonding agent

Fig.5b After finishing & polishing

Fig.3d Light curing in progress

Fig.4a Checking adaptation of putty index

Smile Designing

Dept of Conservative dentistry

Dr Saurabh Ramtekar

Postgraduate student

Introduction –

Esthetic treatment of anterior teeth presents a challenge in clinical practice.(1) After dental bleaching, the most frequently used treatment for deformed teeth involves laminates, which mask or reduce the discoloration.(2)

The biomimetic characteristics of ceramic laminate veneers allow them to behave similarly to natural teeth in terms of strain and stress transference.(3)

Case Report –

A 23-year-old woman complained about spacing between upper front teeth(Figs. 1a and 1b). She also complained about generalized sensitivity of dentition. During clinical evaluation spacing was observed between 11 and 21, 11 and 12, 21 and 22. Also tooth 22 was peg shaped. The deformation and the position of the tooth limited esthetic resolution using direct and conservative techniques, such as dental bleaching and restoration with composite resin veneer. Therefore, a porcelain laminate veneer was chosen to correct position. As tooth 22 had inadequate crown structure, endodontic treatment was planned for tooth 22 followed by full ceramic crown.

Tooth Preparation-

Dental analysis was done.(Fig.2). After endodontic treatment with 22, direct composite build up was done with 22. Composite build up was also done with 12. A round diamond bur (no. 1012, KG Sorensen, São Paulo, Brazil) was used to determine the margin of the cervical region of the tooth. Two vertical depth-orientation grooves were made on the labial surface with a tapered round-ended diamond bur (no. 2135, KG Sorensen) along the longitudinal axis of the tooth. Using the depth of the grooves as a guide, the labial surface was reduced using the same diamond bur. The distal half of the labial surface was further reduced to correct the position of the tooth and better accommodate labial movement of the facial surface. A thin diamond bur (no. 2200, KG Sorensen) was used to prepare the proximal surface.

The preparation margins were finished with diamond burs (no. 2135, 2135F; KG Sorensen) to form a gingival chamfer after intracrevicular insertion of a retraction cord

(no. 00 Ultrapack, Ultradent Dental Products, South Jordan, UT). This helped define the cervical margin so that the laboratory technician could clearly identify the desired extent of the veneer.(Fig.4)

Impression –

The first impression of the prepared tooth was made with silicone putty on a stock tray, with the retraction cord ensuring that a sulcular space was retained for the light impression material. To make space for the light material, the heavy material was partly removed by grinding the interproximal and prepared-tooth areas of the mold. After the cord had been removed, low-viscosity material was injected onto the prepared tooth and the first impression, which was immediately carried to the patient's mouth. An impression of the opposing arch and the occlusal registration are critical if the incisal edge of the veneer is involved in guidance.

Provisional restoration –

After the final impression was made, a temporary restoration was fabricated using a composite resin to protect dental tissues and re-establish tooth shape.

Laboratory prescription –

Close communication with the dental laboratory technician is essential. Photographs taken before and after preparation can help ensure accurate shape, shade, texture and other characteristics.In this case, the veneer was fabricated with a lithium di-silicate porcelain material based on a refractory die system, following the manufacturer's recommendations.(Fig.5)

Resin based luting procedure –

After carefully checking the proximal contacts, shade match, contour and marginal adaptation, luting was performed. A gingival retraction cord was used to prevent contamination by gingival fluid. After cleaning, the tooth surface was etched for 20 seconds with 37% phosphoric acid, then rinsed for 20 seconds. Excess water was removed with absorbent paper, and an adhesive system was applied to the prepared surface (Scotchbond Multipurpose Plus, 3M ESPE, St Paul, MN).

At the same time, the ceramic veneer were etched for 2 minutes with 10% hydrofluoric acid (Dentsply, Petropolis, RJ, Brazil), washed with water and dried. A silane agent (Dentsply, Petropolis) was mixed and applied to the internal surface of the veneer; after 1 minute, a catalyst (Scotchbond Multipurpose Plus, 3M ESPE) was also applied to add a chemical reaction to the light-curing process. Finally, dual cement, A2 shade (RelyX ARC, 3M ESPE), was placed on the internal veneer surface and the veneer was placed on the prepared tooth and pressed lightly with the fingers. Excess interproximal cement was removed with a microbrush and dental floss. The veneer was covered with a glycerin gel as an oxygen barrier to ensure better polymerization of the resin cement and then light polymerization was carried out on both surfaces for 120 seconds. After the margins were finished and polished, occlusion was checked and no adjustments were needed (Fig.6a & b).

Follow up was done. During that time, the marginal integrity of the restoration was maintained and no inflammation was observed in the gingival margin. The restorative treatment remained esthetically acceptable throughout the follow up period.

Discussion –

This clinical report describes how a well-planned diagnostic evaluation, thorough treatment planning, controlled tooth preparation, and ideal ceramic selection, can fulfill a patient’s high esthetic demands. Initially, an additive wax-up was performed, followed by diagnostic mock-up.(4) The waxup information transferred to the mouth provides the patient with an opportunity to experience a physical model of the proposed size and shape of the final

restoration. On the patient's approval, several types of reduction guides can be fabricated from the diagnostic wax-up. Some reduction guides, such as a clear matrix, can provide the clinicianwith an overall evaluation of all teeth to be prepped.(5) In contrast, putty matrix guides can provide measurements of individual areas, such as facial and incisal, on specific teeth. Reduction guides provide the clinician with an opportunity to have a well-controlled tooth preparation appropriate to the type of ceramic restorations selected. Experienced restorative dentists may not need any reduction guide in order to achieve ideal tooth reduction, but the authors highly recommend them as one is gaining experience with these restorations.(6)A rubber dam can be used for isolation in order to achieve ideal results with the adhesive materials.

Fig.1b Preoperative extraoralphotograph

Conclusion –

Porcelain veneers are useful adjuncts to dentists' armamentaria; they help in the management of esthetic problems, minimizing dental tissue reduction. However, they require the dentist to pay close attention to detail throughout the whole clinical procedure.

Fig.1a Preoperative intraoral photograph (labial & palatal view)

Fig.2 Dental Analysis (labial & palatal view)

Fig.3 Composite build up

Fig.4 Final preparation

Fig.5 Lithium di-silicate laminates overcast

Fig.6bPostoperativeextraoral

TOOTH JEWELLERY

Introduction:

Today, people are becoming increasingly selfconscious about their appearance and smile. They are looking for various treatments like body art and cosmetic dental treatments to achieve the desired aesthetic appearance, attention, to make a fashion statement and to be unique among the crowd. Body art includes tattooing, body piercings and oral soft tissue piercings. All body piercings presents a level of risk of infection, and are painful.[1,2] Documented complications are related either to(a) the jewellery (aspiration, allergy or chronic injury to adjacent teeth/ mucosa, including tooth fracture and gum recession, which can lead to tooth loss) or to (b) the piercing procedure (local bleeding, swelling, nerve damage, toxic shock, permanent drooling, impaired sense of taste, or distant infections of the liver, heart or brain), tongue and lip piercings with metal barbell that interferes with speech, taste and mastication.[2,3] but, with the introduction of cosmetic dental treatments like porcelain veneering, composite veneering, bleaching and placement of tooth jewellery, patients smile can be made more pleasing, appealing, and aesthetic. This results in increased self confidence of the patient. Among these cosmetic dental treatments bleaching and veneering procedures are indicated for patients with discolored teeth, spacing between teeth, and mild irregular teeth, where as oral tooth jewellery is for all patients who wants a dazzling smile. The advantages of it being a temporary, painless procedure and it do not involve any invasive treatment on the tooth like drilling holes.

Types of tooth jewellery:

Tooth gems are crystals glass mounted on a thin foil of aluminum to create the attractive spark available in different colors'. Skyce are clear and sapphire – white or blue crystals. Brilliance tooth jewelry is availablein 3 different colors crystal clear, sapphire blue, ruby red and is of two sizes - 1.8mm, 2.6mm.

Rainbow crystals are the least expensive version of tooth jewelry. They're ideally for short term attachment, to try the new service in your practice or for the customer with a smaller budget rainbow crystals are available in 10 different colors and two sizes (1.8mm and 2.5mm) Figure1

CASE REPORT:

A 22 year old girl reported to the department of conservative dentistry and endodontics of government dental college and hospital Nagpur, she want some modification in her smile she heard about tooth jewellery from somewhere she want one for her. We had given her option she had choosen one.

Procedure & bonding instructions:

The tooth is cleaned with a fluoride-free polishing paste. Completely dry and isolate the tooth. Tooth is etched with 37% orthophosphoric acid for about 20-30 sec to increase the surface area for bonding. Rinse surface thoroughly with water and blow dry for 10 sec. (no etchant should remain on the tooth!) Apply a light-curing bonding agent. Leave it on for a maximum of 20 seconds, distribute bonding through air blowing. [4] Then light-cure for 20 sec. Apply a small amount of flow composite to the surface of the tooth.[5] Use a jewel handler to easily pick up the jewel. Press it into the center of the composite. (The composite must ooze on the sides so it is encircled by the composite, ensuring macro mechanical retention, but make certain the jewel is in contact with the enamel.) Now adjust the jewel while letting the patient check the desired positioning in the mirror. Take the light-curing lamp and start curing the composite from the top for about 60 seconds. Light cure from the sides for a few seconds and also cure the composite from

the back of the tooth for another 60 seconds making sure the composite hardens evenly. Total curing time is approximately 180 seconds. The total time for jewel to set into the composite is 20 sec. Do not touch the jewel with your fingers once it's removed from the case. To guarantee maximum adhesiveness, it is essential to avoid skin contact with the special coating on the backside of the jewel It takes about 4 minutes to safely affix the jewel. The enamel is treated with topical fluoride to remineralize the etched area.

preoperative

postoperative

Discussion:

The practice of soft tissue piercings like nose,ear, eyebrows with ornaments jewelleries, and body tattooing are ages old started in Egypt, china and medieval ar

ound 5000 years back. They were considered as a sign of religious and social rank in the community7 but now it is regaining momentum as a fashion and style statement by many young people. Many people are looking for restorative and surgical procedures to look more beautiful and to have a attractive smile. Esthetic procedures like teeth bleaching, veneers, and ceramic crowns are used to improve colour, shape and size of teeth. Then there are new trends of tooth decorative procedures like tooth tattoo, tooth jewellery, grills, and ornamental body piercings of lip, tongue and tooth. Tooth tattoo is applying various shades of porcelain in various designs like hearts, symbols, and pets carved on ceramic crown, crown and bridge by lab technician, then fired in ceramic furnace. It gives personalized embellishment and alternative to body tattoo. But it is an indirect procedure, experienced lab technician, tooth reduction is required to make crown. A tooth tattoo is also easily removed by simply grinding the image off of the crown. A grill is a form of detachable sewellery accessory and comes bathed in metal and on-Demand it is available in gold, encrusted diamonds, imprinted alphabets, thereby making it more attractive. Their price varies depending upon the choice of grills. Grills are considered Status symbols within the hip-hop fashion scene. However, tooth ornaments favors the accumulation of plaque and can diminish the ability to articulate teeth and speech. Lip and tongue piercings with metal stud and barbell leads to infection, swelling, aspiration Fracture of teeth; interfere with speech and mastication.[2, 8, 9]Tooth drilling and piercing causes pulp injury, pain, nonvital and fracture of tooth. Figure8 Tooth jewellery is of two types tooth gems, and twinkles that are attached to anterior healthy tooth with composite resin cement. They shine brightly, splashing bright rays around them and emphasizing the natural whiteness of enamel and add sparkle to a smile. They are bonded to tooth without pain, infection, drilling. They do not interfere with oral hygiene maintenance but if composite resin margins are not polished there is more plaque accumulation and possibility of caries. Tooth jewellery may get deboned if more stress is applied at bonding interface due to hard brushing, eating sticky and hard foods, then it may lost or may go to digestive tract or respiratory[9] and needs medical emergency attention. Patient is instructed about these to take care before tooth jewellery procedure.

Conclusion: Unlike other, tooth gems and jewellery, there is no more pain, infection, no drilling, and no damage to tooth, easily removable and at the same time add more attractiveness and sparkle to the smile, makes them more user friendly. Forget tattooing and body piercing, to be a really celebrity tantalize your teeth with tooth jewellery or tooth gems, add sparkle to your smile. Proper oral hygiene maintenance and regular checkup visit to dentist are required to avoid debonding and caries.

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Dept of Conservative dentistry

Dr Vijeta Makhija

Postgraduate student

Introduction –

Esthetic treatment of anterior teeth presents a challenge in clinical practice.(1) After dental bleaching, the most frequently used treatment for deformed teeth involves laminates, which mask or reduce the discoloration.(2)

The biomimetic characteristics of ceramic laminate veneers allow them to behave similarly to natural teeth in terms of strain and stress transference.(3)

Case Report –

A 25-year-old woman complained about the attrited maxillary anteriors (Figs. 1a and 1b). She also complained about generalized sensitivity of dentition. During clinical evaluation, generalized attrition and abrasion was observed. Also tooth 11 was endodontically treated. The severe deformation and the position of the tooth limited esthetic resolution using direct and conservative techniques, such as dental bleaching and restoration with composite resin veneer. Therefore, a porcelain laminate veneer was chosen to correct position and color mismatch.Previous endodontic treatment of the tooth was found to be adequate.

Tooth preparation –

Dental analysis was done.(Fig.2)A round diamond bur (no. 1012, KG Sorensen, São Paulo, Brazil) was used to determine the margin of the cervical region of the tooth. Two vertical depth-orientation grooves were made on the labial surface with a tapered round-ended diamond bur (no. 2135, KG Sorensen) along the longitudinal axis of the tooth. Using the depth of the grooves as a guide, the labial surface was reduced using the same diamond bur. The distal half of the labial surface was further reduced to correct the position of the tooth and better accommodate labial movement of the facial surface. A thin diamond bur (no. 2200, KG Sorensen) was used to prepare the proximal surface.

The preparation margins were finished with diamond burs (no. 2135, 2135F; KG Sorensen) to form a gingival chamfer after intracrevicular insertion of a retraction cord (no. 00 Ultrapack, Ultradent Dental Products, South Jordan, UT). This helped define the cervical margin so that the laboratory technician could clearly identify the desired extent of the veneer.(Fig.3)

Impression –

The first impression of the prepared tooth was made with silicone putty on a stock tray, with the retraction cord ensuring that a sulcular space was retained for the light impression material. To make space for the light material, the heavy material was partly removed by grinding the interproximal and prepared-tooth areas of the mold. After the cord had been removed, low-viscosity material was injected onto the prepared tooth and the first impression, which was immediately carried to the patient's mouth. An impression of the opposing arch and the occlusal registration are critical if the incisal edge of the veneer is involved in guidance.

Provisional restoration –

After the final impression was made, a temporary restoration was fabricated using a composite resin to protect dental tissues and re-establish tooth shape.

Laboratory prescription –

Close communication with the dental laboratory technician is essential. Photographs taken before and after preparation can help ensure accurate shape, shade, texture and other characteristics.In this case, the veneer was fabricated with a lithium di-silicate porcelain material based

on a refractory die system, following the manufacturer's recommendations.(Fig.4)

Resin based luting procedure –

After carefully checking the proximal contacts, shade match, contour and marginal adaptation, luting was performed. A gingival retraction cord was used to prevent contamination by gingival fluid. After cleaning, the tooth surface was etched for 20 seconds with 37% phosphoric acid, then rinsed for 20 seconds. Excess water was removed with absorbent paper, and an adhesive system was applied to the prepared surface (Scotchbond Multipurpose Plus, 3M ESPE, St Paul, MN).

At the same time, the ceramic veneer were etched for 2 minutes with 10% hydrofluoric acid (Dentsply, Petropolis, RJ, Brazil), washed with water and dried. A silane agent (Dentsply, Petropolis) was mixed and applied to the internal surface of the veneer; after 1 minute, a catalyst (Scotchbond Multipurpose Plus, 3M ESPE) was also applied to add a chemical reaction to the light-curing process. Finally, dual cement, A2 shade (RelyX ARC, 3M ESPE), was placed on the internal veneer surface and the veneer was placed on the prepared tooth and pressed lightly with the fingers. Excess interproximal cement was removed with a microbrush and dental floss. The veneer was covered with a glycerin gel as an oxygen barrier to ensure better polymerization of the resin cement and then light polymerization was carried out on both surfaces for 120 seconds. After the margins were finished and polished, occlusion was checked and no adjustments were needed (Fig.5a & b).

Follow up was done. During that time, the marginal integrity of the restoration was maintained and no inflammation was observed in the gingival margin. The restorative treatment remained esthetically acceptable throughout the follow up period.

Discussion –

This clinical report describes how a well-planned diagnostic evaluation, thorough treatment planning, controlled tooth preparation, and ideal ceramic selection, can fulfill a patient’s high esthetic demands. Initially, an additive wax-up was performed, followed by diagnostic mock-up.(4) The waxup information transferred to the mouth provides the patient with an opportunity to experience a physical model of the proposed size and shape of the final restoration. On the patient’s approval, several types of reduction guides can be fabricated from the diagnostic wax-up. Some reduction guides, such as a clear matrix, can provide the clinicianwith an overall evaluation of all teeth to be prepped.(5) In contrast, putty matrix guides can provide measurements of individual areas, such as facial and incisal, on specific teeth. Reduction guides provide the clinician with an opportunity to have a well-controlled tooth preparation appropriate to the type of ceramic restorations selected. Experienced restorative dentists may not need any reduction guide in order to achieve ideal tooth reduction, but the authors highly recommend them as one is gaining experience with these restorations.(6)A rubber dam can be used for isolation in order to achieve ideal results with the adhesive materials.

Conclusion –

Porcelain veneers are useful adjuncts to dentists' armamentaria; they help in the management of esthetic problems, minimizing dental tissue reduction. However, they require the dentist to pay close attention to detail throughout the whole clinical procedure.

Fig.1a Preoperative intraoral photograph

Fig.1b Preoperative extraoralphotograph

Fig.2 Dental Analysis

Fig.3 Final preparation

Fig.4 Lithium di-silicate laminates overcast

Fig.5aPostoperative intraoral photograph

Fig.5bPostoperativeextraoral

References -

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DEPARTMENT OF ORTHODONTICS

EXTRACTION DECISION CRITERIA

By- Dr. Swapnil Mangwade

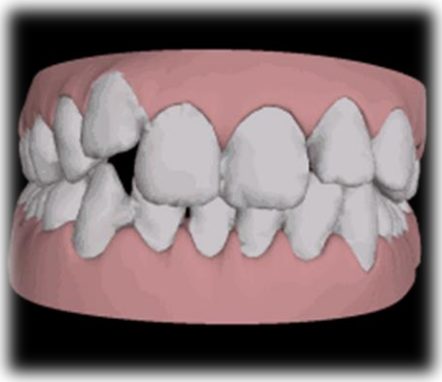
First year Postgraduate student

Department of Orthodontics

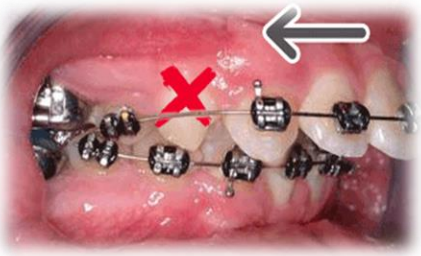
Introduction :-

- Why do we extract the teeth ?

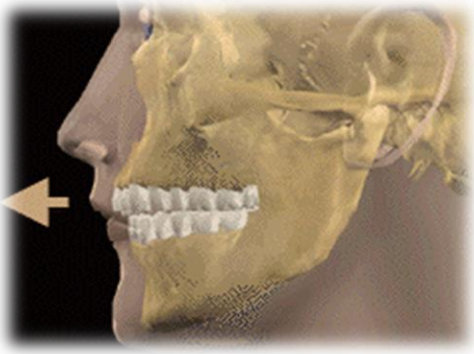
I. To provide space for the alignment of crowded teeth



II. For retraction of protruded teeth



III. To camouflage Skeletal Class II and Class III malocclusion.



- Reason for commonly extracted teeth are

a) Crowding 73 %
b) Incisor protrusion 35 %
c) Need for profile correction 27 %
d) Class II severity 15 %
e) Achievement of stable result 9 %

The decision to extract: part h. Analysisof clinicians' stated reasons for extraction Sheldon baumrin detall; am j orthoddentofacorthop1996;109:393-402.

1. **Decision criteria for extraction diagnosis**: -

a) Type of malocclusion
b) Tooth ratio analysis

c) Howes analysis
d) Nature of growth pattern

a) **Type of malocclusion** :-

a. For ortho extraction in class I crowding &/protrusion:

Discrepancy	Treatment objective
<4mm	**EXTRACTIONrarely indicated.** (severe incisor protrusion or a severe vertical discrepancy)
5-9mm	**Hard** and **soft tissue** characteristics. Final **position of incisors.**
More than 10mm	**EXTRACTION** almost always.

b. CLASS II :-
Treatment plan vary with the treatment options.

i. For camouflage
- Upper first premolars are extracted.
- Lower (not always) second premolars are extracted.

ii. For surgical
- Lower premolars are extracted.
- Upper second premolars are extracted.

c. CLASS III :-

i. For camouflage
- Lower first premolar alone are extracted.
- Lower first premolar + upper second premolar are extracted.

ii. For camouflage
- Upper first premolarare extracted
- First premolarare extracted.

b) Tooth ratio analysis :-

- Boltons (1995) intermaxillary tooth ratio analysis.
- Wayne A.Bolton pointed out that the extraction of one tooth or several teeth should be done according to the ratio of tooth material between the maxillary and mandibular arch.
- To attain an optimum inter-arch relationship.
- Boltons analysis helps to determine the disproportion between the size of maxillary and mandibular teeth.
- To get and ideal interdigitation,overjet,overbite and alignment of teeth.
- Inter-arch tooth size discrepancy.
- A discrepancy greater than 4mm – indicated for extraction.

$$\text{Anterior Bolton ratio} = \frac{\text{Sum of mesiodistal widths of mandibular anterior 6 teeth}}{\text{Sum of mesiodistal widths of maxillary anterior 6 teeth}} \times 100$$

$$\text{Overall Bolton ratio} = \frac{\text{Sum of mesiodistal widths of mandibular 12 teeth}}{\text{Sum of mesiodistal widths of maxillary 12 teeth}} \times 100$$

- Inference
- Overall Ratio

- If the ratio is less than 91.3% it indicates maxillary tooth material excess.
- Amount of excess can be calculated by Sum of maxillary 12- sum of mandibular 12 × 100 91.3

- If the ratio is greater than 91.3% it indicates mandibular tooth material excess.
- Amount of excess can be calculated by sum of mandibular 12- sum of maxillary 12 × 91.3 100

➢ Anterior ratio

- If the ratio is less than 77.2% it indicates maxillary anterior excess material
- Amount of excess material can be calculated by Sum of maxillary 6- sum of mandibular 6 × 100 77.2
- If the ratio is greater than 77.2% it indicates mandibular anterior excess material.
- Amount of excess can be calculated by sum of mandibular 6 – sum of maxillary 6 × 77.2 100

c) Ashley Howes analysis :-

❑ Crowding = arch width rather than arch length.

❑ Relation exist between 12 teeth ant second molar and width of dental arches in premolar.

❑ Premolar diameter

❑ **Premolar basal arch width**

❑ **Premolar basal arch width percentage**

PREMOLAR BASAL ARCH WIDTH x 1oo

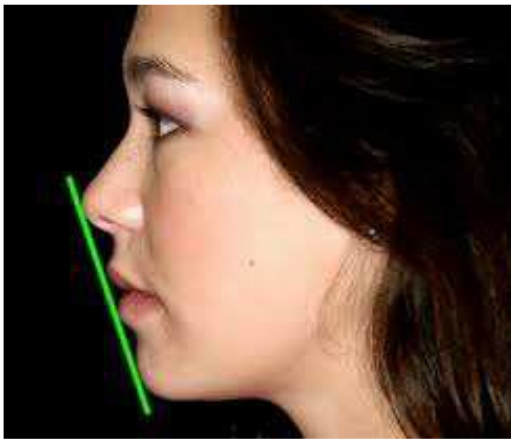
TOTAL TOOTH MATERIAL

d) Nature of growth pattern :-

I. **Horizontal :- Favours the extraction**

II. **Vertical :- Do not favours the extraction**

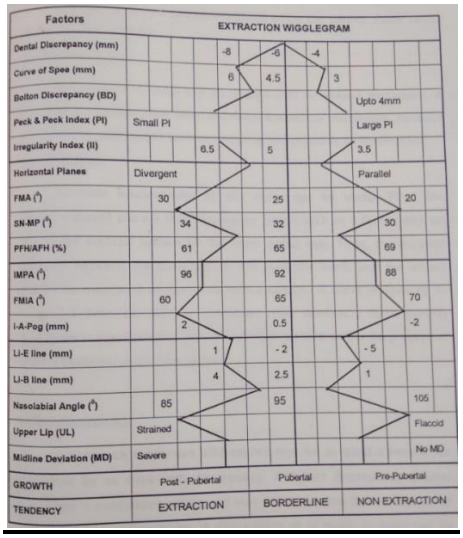
2. Border line case :-



A case is said to be borderline case when patient has good soft tissue profile but extraction of permanent teeth is required ,that extraction can affect the soft tissue profile.

3. Wigglegram-decision making criteria

- Given by Rody and Aroujo 2002
- There are18 parameters.
- When more than 11 parametersare one side, that will be the deciding factor.
- It gives relationships of dental, skeletal, and facial cephalometric measurements



A. Dental variables: -

1. Dental discrepancy
2. Curve of spee
3. Bolton discrepancy
4. Peck and peck index
5. Irregularity index

B. Cephalometric variables: -

1. Relationship of horizontal planes
2. FMA
3. SN-MP
4. PFH/AFH
5. IMPA
6. FMIA

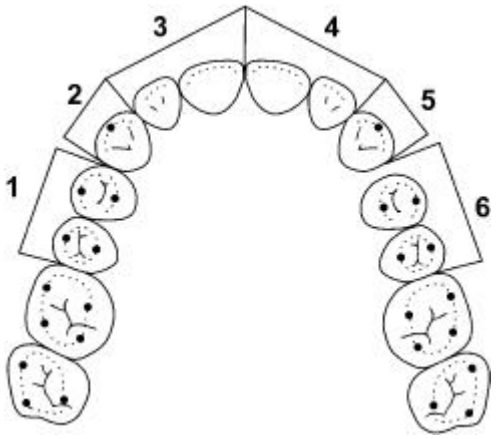
C. Facial variables:-

1. Distance between lower incisor and a pog
2. Distance between e line and lower lip
3. Distance between b line and lower lip.
4. Nasolabial angle
5. Upper lip morphology
6. Dental midline deviation

a) Dental variables: -

1. Dental discrepancy

- ❑ Discrepancy of 4-8mm **can be** treated with with or without extraction.
- ❑ Discrepancy greater than 8 mm indicates need for extraction.



2. Curve of spee :-

- ❑ Rectangular object is placed on posterior teeth and the deepest distance between teeth and object is measured.
- ❑ When this value is more,more space is required for correction and viceversa.
- ❑ Curve of spee 3-6mm –mild
- ❑ Curve of spee> 6mm –indicated for extraction.

3. Bolton discrepancy: -

- ❑ Wayne A.Bolton pointed out that the extraction of one tooth or several teeth should be done according to the ratio of tooth material between the maxillary and mandibular arch.
- ❑ To attain an optimum interarch relationship.
- ❑ Boltons analysis helps to determine the disproportion between the size of maxillary and mandibular teeth.
- ❑ To get and ideal interdigitation,overjet,overbite and alignment of teeth.
- ❑ Inter-arch tooth size discrepancy.
- ❑ A discrepancy greater than 4mm – indicated for extraction.

$$\text{Anterior Bolton ratio} = \frac{\text{Sum of mesiodistal widths of mandibular anterior 6 teeth}}{\text{Sum of mesiodistal widths of maxillary anterior 6 teeth}} \times 100$$

$$\text{Overall Bolton ratio} = \frac{\text{Sum of mesiodistal widths of mandibular 12 teeth}}{\text{Sum of mesiodistal widths of maxillary 12 teeth}} \times 100$$

- ❑ Inference

➢ Overall Ratio

- If the ratio is less than 91.3% it indicates maxillary tooth material excess.
- Amount of excess can be calculated by Sum of maxillary 12- sum of mandibular 12 × 100 91.3
- If the ratio is greater than 91.3% it indicates mandibular tooth material excess.
- Amount of excess can be calculated by sum of mandibular 12- sum of maxillary 12 × 91.3 100

➢ Anterior ratio

- If the ratio is less than 77.2% it indicates maxillary anterior excess material
- Amount of excess material can be calculated by Sum of maxillary 6- sum of mandibular 6 × 100 77.2
- If the ratio is greater than 77.2% it indicates mandibular anterior excess material.
- Amount of excess can be calculated by sum of mandibular 6 – sum of maxillary 6 × 77.2 100

4. Peck and peck index :-

- ❑ Crowded lower incisor were much wiser mesio-distally or bucco-lingually.

❑ Mesio-distal width X 100

Labio-lingual width

❑ Inference

- Lower Central incisor-85-92% indicates normal.
- Lower Lateral incisor-90-95% indicates normal.
- **Greater index indicates wide MD width-stripping can improve the shape of these teeth.**
- **In borderline cases- with narrow incisors index less than 88% not indicated for stripping.**

5. Irregularity index :-

❑ Given by Little.
❑ To evaluate alignment of mandibular incisor.
❑ **Obtained by adding the linear distance between the five adjacent anatomic contact point of lower incisor.**
❑ Inference

1. Score 0-patrfectly aligned incisor

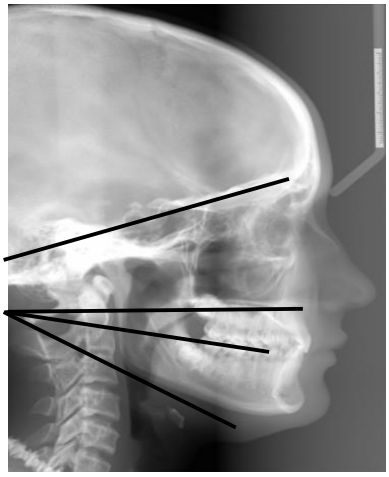
2. 3.5-6.5mm-mild irregularity.

3.>6.5mm-indicated for extraction.

b) Cephalometric variables

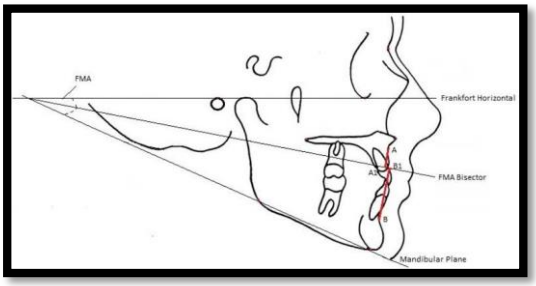
1. Relationship of horizontal planes :-

❑ Reflect proportionality of craniofacial skeleton.
❑ Highly Divergent planes –favours extraction
❑ Parallel planae-does not favours extraction.



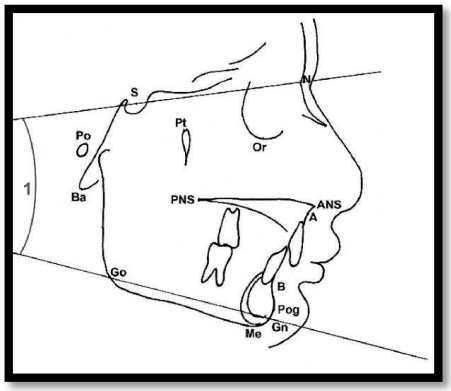
2. Frankfort mandibular plane angle :-

❑ Intersection of Frankfort plane and mandibular plane.
❑ Normal value 20-30.
❑ High value-vertical grower ,open bite.
❑ Less value-horizontal grower, deep bite.



3. SN -MP

❑ Normal values 30-34 (schudy)
❑ Provide vertical praportionality of craniofacial skeleton.

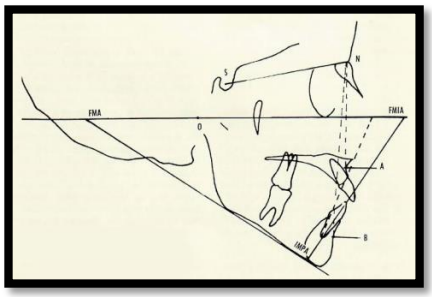


4. PFH/AFH :-

- ❑ To evaluate vertical equilibrium of craniofacial skeleton.
  Post facial height X 100
  Ant facial height
- ❑ Normal 61-69
- ❑ <61-vertical growth pattern
- ❑ >69-horizontal growth pattern\

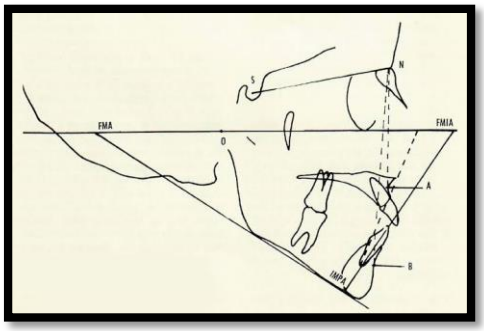
5. IMPA :-

- ❑ To evaluate inclination of lower incisor to mandibular plane.
- ❑ According to tweed it can vary between 85-95 .
- ❑ Value is influenced by mandibular plane inclination.
- ❑ Greater than 96 is an indicated for extraction.



6. Frankfort mandibular incisor angle(FMIA) :-

- ❑ 60-70
- ❑ < 60—proclination of lower incisor.
- ❑ >70 –lower incisors are retroclined.



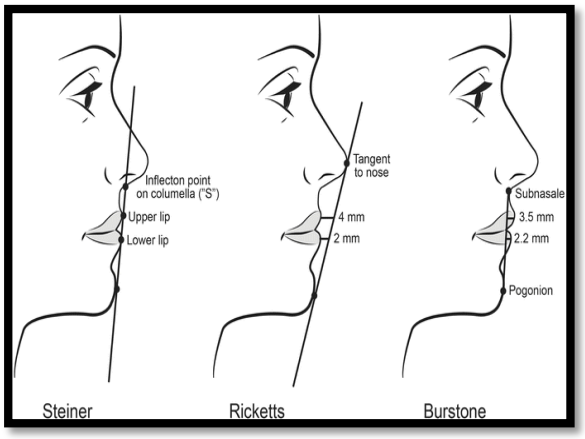
c) Facial variables :-

1. Distance between lower incisor and the A-pog line

- ❑ To evaluate inclination of lower incisor.
- ❑ Negative value-incisors are behind the A-pog line.
- ❑ Positive value-Incisor are ahead of A-pog line.
- ❑ 2-3mm indicates good sagital position of lower incisor.

2. Distance between E line and Lower Lip :-

- ❑ Normally lower lips are 2 mm behind the reference line but because of considerable variation in terms of age and sex , standard deviation of 3mm was admitted by Rickets.
- ❑ -5 to +1 mm is normal.
- ❑ Value greater than that indicates protrusive lip usually indicated for extraction.

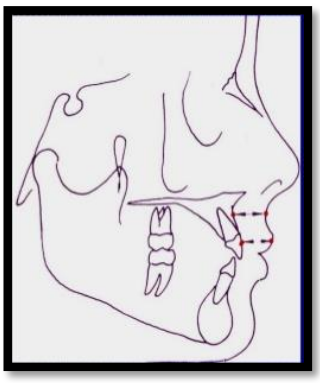


3. Nasolabial angle :-

- ❑ FORMED BETWEEN TANGENT FROM COLUMELLA AND TANGENT TO UPPER LIP.
- ❑ 90-110
- ❑ Drobocky philosophy.

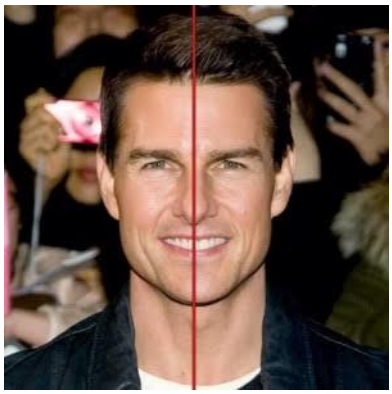
4. Upper lip morphology :-

- ❑ Thickness of upper lip can be measured at 2 different areas.
- 3 mm below skeletal point A
- From vermillion border to labial surface of maxillary central incisor.
- ❑ In borderline cases with strained lip ,incisor can be retracted without altering soft tissue profile-extraction is indicated.
- ❑ Extraction is avoided in case of flaccid lip due to lack of labial support.



5. Dental midline deviation :-

- ❑ Midline is measure at nasal bridge,nasaltip,philtrum,upper dental midline,lower dental midline,chin.
- ❑ If isis skeletal-treat surgically
- ❑ Dental-can be treataed with extraction.



5. Conclusion :-

Decision of extraction is not that easy as it looks, it depend mainly on decision. Criteria, ability of orthodontist. Also it vary with each patient.

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TO EXTRACT OR NOT TO EXTRACT A DECIDUOUS TOOTH

By- Dr. Kanchan Narkhede

First year Post graduate student

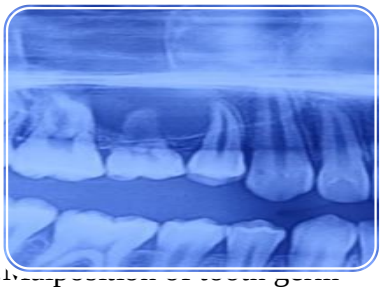
Department of Orthodontics

What is an Over-retained tooth ?

Deciduous teeth that persist beyond their shedding time is known as retained deciduous teeth.

Local causes for overetained deciduous teeth.

1.Agensis of replacing tooth



2.Malposition of tooth germ

3.Supernumerary teeth

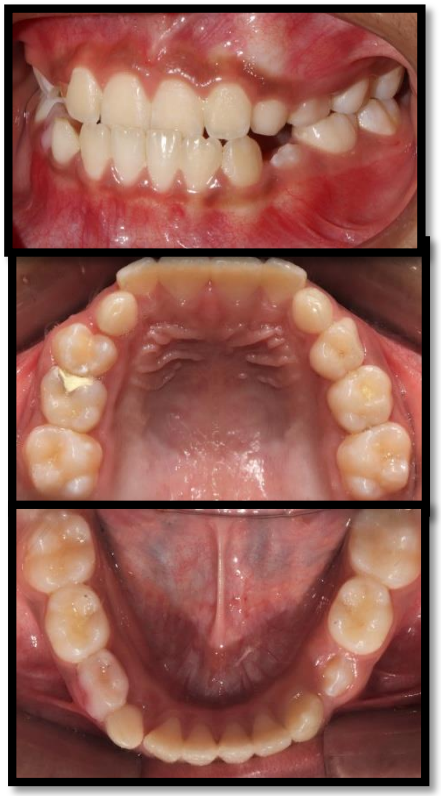
4. Ankylosis

To extract or not to extract a deciduous teeth depends on the structural , functional and aesthetic requirements.

Case 1

A 14-year-oldboy, Vedant reported to the department of Orthodontics with a chief complaint of forwadly placed lower front teeth of the jaw.

EXTRA-ORAL EXAMINATION



- Mixed Dentition
- Retroclined upper and lower anteriors
- Anterior crossbite

- Competent lips
- Straight profile

INTRA-ORAL EXAMINATION

Treatment was progressed using protaction utility arch in the upper arch

Shows retained maxillary deciduous canine with erupting permanent maxillary canine.

After 2 months

Correction of Overjet was achieved

Retained deciduous canine still in position

PROGRESS OF CASE

Extraction of overretained deciduous canine after correction of anterior crossbite to facilitate eruption of peramanent canine.

CASE 2

A 15-year-old boy, Aditya reported to the department of Orthodontics with a chief complaint of forwadly placed lower front teeth of the jaw.

EXTRA-ORAL EXAMINATION

- Incompetent lips
- Convex profile
- Deep mentolabial sulcus
- Skeletal class II

OPG

INTRA-ORAL EXAMINATION

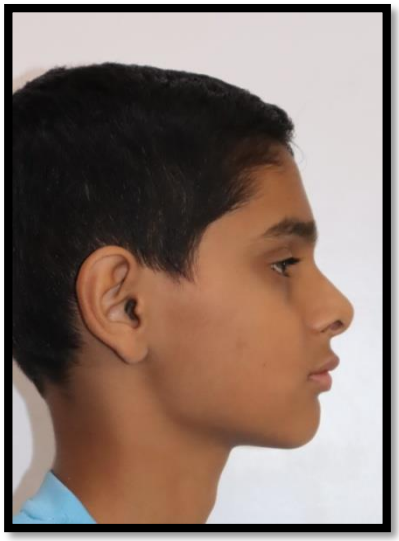
- Proclined upper and lower anteriors
- Increased overjet and overbite.
- Class II Molar relationship

- Overretained 55

OPG

absence of permanent successor , thus the decision was made to retain the deciduous molar and proceed with twin block appliance for correction of skeletal class II.

Twin block appliance



Progress of the case with the appliance

EXTRA-ORAL EXAMINATION

- Patient had a cleft in maxilla
- Mild concave profile
- Potentially competent lips

INTRA-ORAL EXAMINATION

- Over retained E on right side.
- Peg shaped 22
- Missing 12
- Rotated 21
- Anterior crossbite

CASE 3

A 12-year-old girl , Devika reported to the department of Orthodontics with a chief complaint of malaligned upper front teeth of the jaw.

OPG

OPG shows over retained E with missing permanent successor.

The treatment plan was progressed as follows

1. Alingment and levelling with expansion
2. Alveolar bone grafting
3. Proclination of upper anterior

Alingment and levelling with expansion

Correction of rotation of 21

Correction of anterior crossbite

Alveolarbone grafting

Deciduous teeth retained in position with the case under progress.

IN PROGRESS

OVERCOMING WRONG TOOTH EXTRACTIONS

By- Dr. Nikita Baheti

Second year Postgraduate student

Department of Orthodontics

Introduction

To err is human…

Orthodontist is the one who make decision for extraction, but extractions are usually executed by another dentist. Orthodontics is a speciality where teeth requiring removal are mostly intact and therefore at higher risk of identification error and extra risks here include documentation error and communication error, both between ortho-dontist and dentist. Wrong tooth extraction cases present both ethical and legal concerns, at the same time affect treatment plan and final outcome of orthodontic treatment. Management of these cases does not include blaming each other; rather we should do what we can do best! Awareness of our

shortcomings is the first step towards overcoming them.

An ounce of prevention is better than a pound of cure and it is always better to prevent such misery but, if incorrect tooth extraction happens we should be well verse about management options. We should do what we can do best, for the benefit of the patient.

Management options

- Altered mechanics
- Auto-transplantation of tooth
- Re-implantation of tooth
- Prosthetic replacement

Re-Implantation of tooth

Case 1

History and chief complaint

The Patient named N.G., age 14 years reported with a chief complaint of forwardly placed upper front teeth of the jaw. Her medical and dental history was negative. The extra-oral and intraoral features are summarized in Tables 1-2. Figures 1 and 2 reflect these findings.

Table 1: Extra-oral analysis

PARAMETERS	INFERENCES
Facial form	Euryproscopic
Facial profile	Convex
Facial height	Upper facial height/lower facial height: Increased
Lips	Incompetent
Naso-labial angle	Acute

Table 2: Intra-oral analysis

PARAMETERS	INFERENCE
Teeth present	7 6 5 4 3 2 1/1 2 3 4 5 6 7 (unerupted 8s) 7 6 5 4 3 2 1/1 2 C 3 4 5 6 7 (unerupted 8s)
Molar relation	End on on the right side and Class II on the left side
Canine relation	Class I on the right side and cannot assess on the left side
Overjet	13 mm
Overbite	80 %
Maxillary arch	U shaped, asymmetric with spacing of 2 mm
Mandibular arch	U shaped, asymmetric, with crowding of 2 mm, over-retained 73 and impacted 33

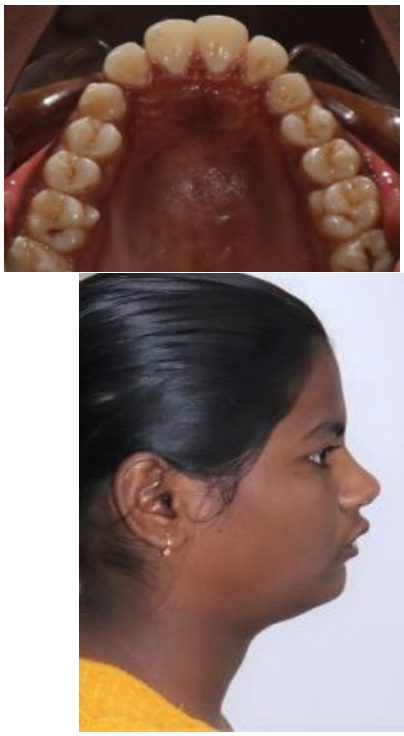


Figure 1: Pre-treatment extra-oral photographs

Figfure 2: Pre-treatment intra-oral photographs

Figure 3: Pre-treatment radiographs

Diagnosis

Patient named N.G., age 14 years was diagnosed as Angle's Class II Div 1 malocclusion underlying a Class II skeletal base with horizontal growth pattern. Other associated problems include over-retained 73, unfavourably positioned impacted 33 and spacing of 2 mm in the upper arch and 2 mm of crowding in the lower arch, proclined and forwardly placed upper and lower incisors and lower dental midline deviation to the left by 3 mm. Overall dental health was fair. Soft tissue parameters reveal protrusive lips, convex facial profile and presence of lip strain.

Treatment plan

Extraction w.r.t., 14,24,73,33,44 followed by symmetrical space closure in the upper arch and asymmetrical space closure in lower arch to correct midline and further mandibular advancement by fixed functional therapy to correct underlying skeletal discrepancy. The case is thus planned to be finished with Angle's Class I molar and class I canine relationship on the both sides along with corrected midline, normal overjet and overbite, and correction of soft-tissue profile.

Clinical scenario

A treatment plan was constructed which included extraction of 73,33,14,24,44. Patient was initially referred for extraction of over-retained 73 and unfavourably positioned impacted 33 in department of oral surgery which was successfully done by one of the resident doctor. After seven days patient came for suture removable, at the same time extraction w.r.t., 14 and 44 was carried out by the same resident doctor. A week later patient reported for extraction of one remaining tooth i.e., 24. Due to absence of previous resident doctor case was transferred to another resident doctor who was unaware of previous extraction w.r.t., impacted 33 and by considering routine all first premolar extraction case extracted 24 as well as 34! WRONG TOOTH EXTRACTION HAPPENED!

As a part of routine protocol patient reported to department of orthodontics immediately after extraction. We were shocked to see extracted 34 since already impacted 33 was extracted and we cannot afford any further tooth loss in lower arch. The simple option was to leave the errant extraction space open for eventual prosthetic replacement. Another option was to try to close the improper extraction site; however, this plan was fraught with disaster. Our final option was to re-implant wrong extracted tooth to the socket site - admittedly a long shot. Our reasoning was that if this failed, admittedly a good chance, we could always fall back on the prosthetic replacement choice. If it succeeded, we could solve a lot of problems for both the patient and the surgeon.

Management of wrong extracted tooth

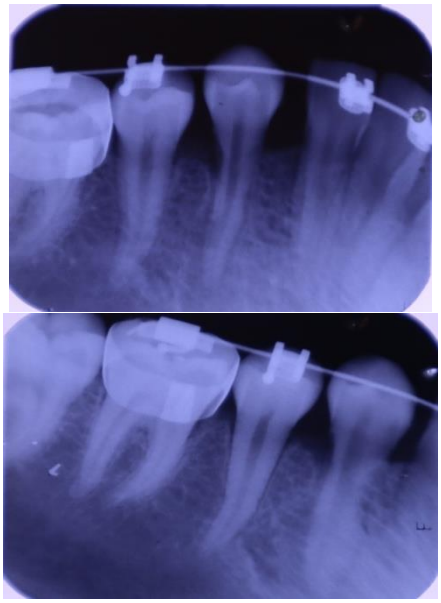
1. Tooth preparation- Irrigated using 20ml Normal Saline solution.

2. Socket preparation- During extraction there was in fracture of buccal wall of the socket which was reduced before re-transplantation and irrigated using 20ml normal saline solution.

3. Stabilization- tooth was splinted using figure of eight wiring technique and no early tooth movement was done.

Results

Two weeks after the re-implant, bonding was done as planned and the reimplanted tooth was bypassed. The splint was removed 2 weeks after the reimplantation procedure, there was generalized widening of PDL space and grade I mobility present (fig 4). A second radiograph was taken 2 month after the procedure and tooth had started to develop a periapical radio-opacity which is indicative of tooth ankylosis (fig 5). Finally treatment is compromised!



(Figure 4: IOPA after 2 weeks)
(Figure 5: IOPA after 2 months)

Critical appraisal

Traumatic extraction leads to in fracture of buccal wall of the socket and any kind of instrumentation while socket preparation leads to loss of PDL attachments. Tooth and socket were irrigated using normal saline solution which is hypotonic. Due to hypo-tonicity of the solution it diffuses into the PDL cells and leads to cell death. Lastly, rigid splinting aids in tooth ankylosis by preventing any kind of tooth movement.

Case 2

History and chief complaint

The Patient named G.B., age 19 years reported with a chief complaint of malaligned teeth of the jaw. Her medical and dental history was negative. The extraoral and intraoral features are summarized in Tables 3-4. Figures 6 and 7 reflect these findings.

Table 3: Extra-oral analysis

PARAMETERS	INFERENCES
Facial form	Mesoproscopic
Facial profile	Convex
Facial height	Upper facial height/lower facial height: Increased
Lips	Competent
Naso-labial angle	Average

Table 4: Intra-oral analysis

PARAMETERS	INFERENCE
Teeth present	7 6 5 4 3 2 1/1 2 3 4 5 6 7 (unerupted 8s) 7 6 5 4 3 2 1/1 2 C 3 4 5 6 7 (unerupted 8s)

Molar relation	Class II on the right side and Class I on the left side
Canine relation	cannot assess on both sides
Overjet	1.5 mm
Overbite	40 %
Maxillary arch	U shaped, asymmetric with crowding of 12 mm
Mandibular arch	U shaped, asymmetric, with crowding of 15 mm

Figure 6: Pre-treatment extra-oral photo

Figure 7: Pre-treatment intra-oral photographs

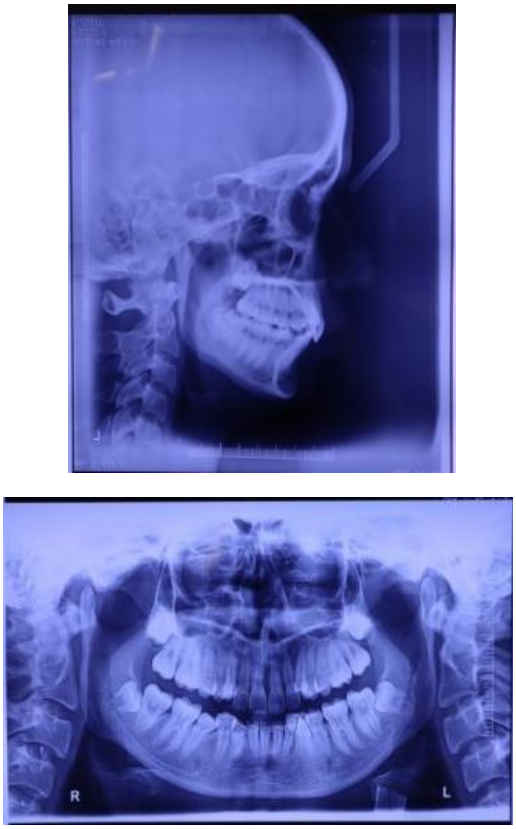


Figure 8: Pre-treatment radiographs

Diagnosis

Patient named G.B., age 19 years was diagnosed as Angle's Class II Div 2 subdivision Left malocclusion underlying a Class II skeletal base with average growth pattern. Other associated problems include infraocclusion w.r.t., 45; lingually present 34 with crowding of 12 mm in the upper arch and 15 mm in the lower arch, retroclined upper incisors and upper dental midline deviation to the left by 1 mm and lower dental midline deviation to the left by 3 mm compared to facial midline. Overall dental health was fair. Soft tissue parameters reveal slight protrusive lips and convex facial profile.

Treatment plan

Extraction of 14,24,34,45 followed by symmetrical space closure in the upper arch and asymmetrical space closure in lowers arch to correct midline, protraction of 46 to achieve class I molar relationship on right side followed by advancement genioplasty (if required) to correct soft tissue profile. The case is planned to be finished with Angle's Class I molar and Class I canine relationship on the both sides, corrected midline, normal overjet and overbite, and correction of soft-tissue profile.

Clinical scenario

A treatment plan included extraction with 14,24,34,45. Patient was referred to the department of Oral surgery for the same where check up was done in the OPD without paying much attention to the advised extraction from the department of Orthodontics and extraction of 14,24,35,45 was written down! (Remember our treatment plan was extraction with 34 and not 35). Patient was immediately taken for extraction of 24 and 35 which was wrongfully written on case paper and was carried out by one of the resident doctor. And thus, WRONG TOOTH EXTRACTION HAPPENED!

These are the situations where we can say human lost ability to think. 34 was entirely out of arch while 35 was well aligned in spite of thinking once about why to extract 35 that resident doctor blindly followed what was written on OPD paper and did wrong extraction.

As a part of routine protocol patient reported to department of orthodontics immediately after extraction. We were shocked to see extracted 35 and presence of intact 34 which was out of arch. Situation arised where we need to alter our treatment plan. The options

were accept wrong extraction and alter treatment mechanics to align lingually present 34 and compromise results. Another option was extract 34 and auto-transplant in socket of 35 which present with risk if failed. Our final option was to re-implant wrong extracted tooth to the socket site. Our reasoning was that if this failed, admittedly a good chance, we could always fall back on alter mechanics choice. If it succeeded, we could solve a lot of problems for both the patient and the surgeon. This time we were well versed about previous faults, problems and ready to give our best shot for the management of wrong extracted tooth.

Management of wrong extracted tooth

Tooth preparation- 1. Irrigated using 20ml Ringer's lactate solution
2. Treated with doxycycline and metronidazole preparation
3. Soaked in 20 ml of citric acid solution
4. PRF (Platelet rich fibrin) membrane used as scaffold around the tooth

Socket preparation-1. Irrigated using 20ml Ringer's lactate solution.
2. PRF (Platelet rich fibrin) membrane placed in the socket

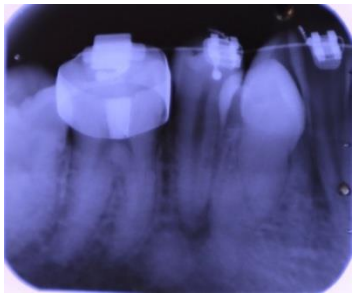
Stabilization-1. With figure of eight suturing technique
2. Relieved occlusion for 7 days using bite turbo

Follow up-1. Functional movements started after 1 week
2. Early orthodontic movement started after 3 weeks

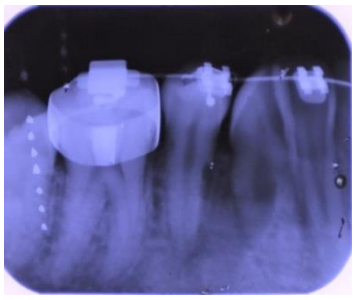
Results

The suture was removed 1 week after the re-implantation procedure and tooth present with the periapical radiolucency (fig. 9) and grade I mobility. Three weeks after the re-implant, the bonding was done as planned and the re-implanted tooth was included. Radiograph was taken 2 month after the re-implantation procedure, revealed generalized widening of periodontal ligament (fig. 10), with the tooth exhibiting no mobility. After 4 months radiograph was taken which revealed normal PDL space (fig. 11) with no mobility and 2 mm of tooth movement achieved. At the same time lingually present 34 was extracted.

(fig.9: IOPA after 1 week)



(fig.10: IOPA after 2 months)



(fig.11: IOPA after 4 months)

Critical appraisal

Atraumatic extraction is a key for success for re-implant procedure which avoids any kind of instrumentation while socket preparation thus prevents loss of PDL attachments. Tooth and socket were irrigated using ringer's lactate solution which is isotonic. Isotonicity maintains vitality of the cells. Rigid splinting promotes ankylosis of tooth thus suturing is advisable for stabilization. Lastly, early functional and orthodontic movement prevents tooth ankylosis and aid in normal PDL formation.

As we all know that prevention is always better than cure, guidelines for prevention of wrong tooth extraction in Orthodontics are as follow:

- Communication between Orthodontist and Oral surgeon
- Follow same tooth numbering system throughout hospital setting
- Precede bonding before extraction and bond all teeth except the teeth to be extracted which would help in direct identification
- Mark the teeth to be extracted before extraction procedure
- Patient education about tooth to be extracted (patient involvement)
- Teeth to be extracted should be written on white board in bold letters which is easily visible to surgeon

Conclusion

It is always better to follow guidelines and prevent wrong tooth extraction. But, as humans are bound to error, in case a wrong tooth extraction happens it is important to give our best shot for preservation of that tooth. By following above mentioned protocol it is possible to re-implant wrongly extracted tooth and prevent compromised results and legal issues.

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TO EXTRACT OR NOT TO EXTRACT– THE GREAT DEBATE

By- Dr. Niyati Mehta

Second year Postgraduate

Department of Orthodontics

INTRODUCTION

To be or not to be? That is the question.This is a famous saying of the William Shakespeare from the play hamlet, it contemplates the absolute need of existence against non-existence to freed oneself form all the worries. On similar lines to extract or not to extract has been a key question with endless dilemma in planning orthodontic treatment since 100 years Orthodontics, is rich in its history as well as controversies. Controversies unlike disputes, never end and cannot be resolved completely validating any one side of the argument through scientific evidence. One such controversy is extraction vs non-extraction.

In the common man's perspective, crowding, more often than spacing constitutes malocclusion. Treatment of a crowded arch requires space gaining. This has been achieved through two ways of treatment – extraction or non-extraction modality. Extraction to create space for accommodation of the remaining teeth of crowded dental arches was written up in the dental literature as long as 1771. It was a new idea then and certainly is not so now.

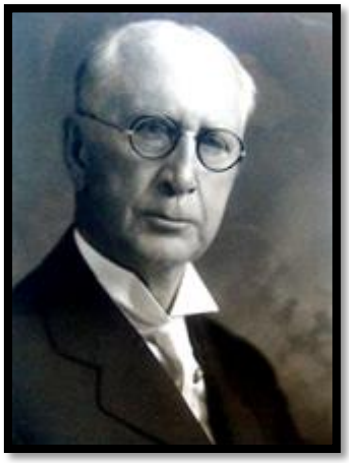
Historical perspectives

Extraction of deciduous teeth has been in practice since ancient civilizations. There was little or no opposition to extraction of deciduous teeth to clear the way for permanent successors when Celsus and Pierre Fauchard recommended it.

The disagreement arose when dentists started removing permanent teeth for the treatment. Hunter (Natural History of Teeth, 1771), was the foremost

author, who opposed it on the basis that it inhibited growth. In the early 1800s, class II division 1 malocclusions were usually treated by extraction of maxillary first premolars. But Delabarre in 1818, warned against its unwanted sequelae. He said, “It is much easier to extract teeth than to determine if it is absolutely necessary”. In 1887, Isaac B. Davenport delivered a lecture in New York against extractions, stating that extractions caused “A loss of an important organ” .

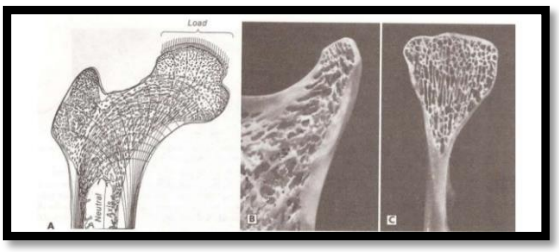
Edward H Angle was the most dominant, dynamic and influential figure in orthodontics.



He is regarded as the ‘’Father of Modern Orthodontics’’. Initially, Edward Hartley Angle believed that extraction of teeth was necessary to solve orthodontic treatment problems. Angle’s book, “Treatment of Malocclusion of the Teeth and Fractures of the Maxillae- Angle System” sixth edition, was published in 1900, containing an enormous amount of material and case reports in which the extraction of teeth was involved. Angle advocated extraction to improve facial appearance.

Rousseau, a philosopher, believed that many of the ills of the modern man owed to the environment we now live in. He emphasized on the perfectibility of man. Consequently, from an orthodontic viewpoint, a perfect occlusion could never be achieved by extracting teeth. This became an article of faith for Angle and the early orthodontists, that every person had the prospective to attain an ideal relationship of all thirty two natural teeth, and therefore extraction for orthodontic purposes was never needed.

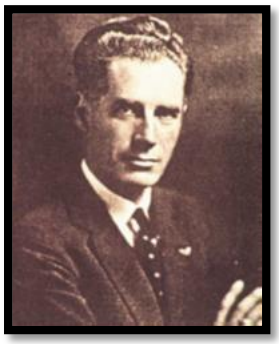
In the early 1900s, a German anatomist andsurgeon, Julius Wolff demonstrated that bone trabeculae arrange in reaction to the stress lines on the bone ("Wolff's law of bone"). Angle was impressed by the discovery that the architecture of bone responds to the stresses placed on that part of the skeleton and thereby reasoned that, forces transmitted to the teeth would cause bone to grow around, if teeth were placed in a proper occlusion. He described his edgewise appliance as a ‘bone growing appliance’. Any relapse observed in any of his treated cases was considered to be a result of inadequate occlusion. Angle believed that the relationship of the dentition to the face, and with it the esthetics of the lower face, would vary. But for each individual, ideal facial esthetics would result when the teeth were placed in ideal occlusion. So accordingly, his treatment for every patient involved expansion of the dental arches and elastics as needed to bring the teeth into occlusion, and extraction was not necessary for stability of result or esthetics.



The EXTRACTION DEBATE

Angle's concepts did not go unchallenged. His great professional rival, Calvin Case, argued that even if the arches were expanded to bring all the teeth into alignment, the stability and esthetics would not be satisfactory in the long run for most of the patients. The controversy culminated in a widely publicized debate between Angle's student Martin Dewey and Calvin Case. The battle commenced in 1911 that culminated as "The Extraction Debate of 1911." In 1911, at a meeting of the National DentalAssociation, Calvin Case presented an article, "The Question of Extraction in Orthodontia", in which he strongly disapproved the creationist belief of the Angle School, considering their ignorance on heredity as a cause of malocclusion ,their thought that local factors were responsible for malocclusion and replacing teeth in their planned positions would result in a harmonious face.

Calvin Case further presented a patient to prove his point. He stated that the patient's dental protrusion would have deteriorated if a non-extraction treatment was done. Thereby highlighting that non-extraction treatment cannot be done in all the cases, to achieve a harmonious face. Even though Case had better argument by far, Angle's followers won the day, and extraction of teeth for orthodontic reasons gradually declined from the American orthodontic scene in the period between World Wars I and II.



The RE-INTRODUCTION of EXTRACTION in MID - 20th Century

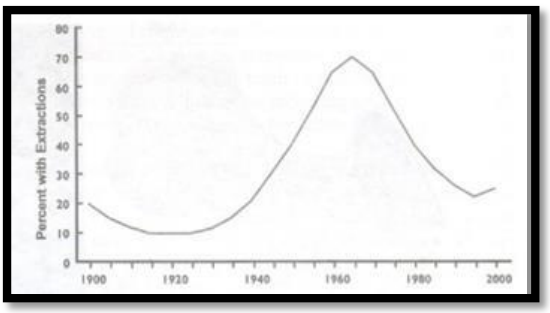
In the 1930s, relapse after non-extraction treatment was frequently observed. In 1952, Charles Tweed, a student of Angle, presented case reports on patients who were treated by non – extraction initially using Angle's treatment philosophies and were later re treated with first premolar extractions. Four first premolar teeth were removed and the teeth were aligned and retracted. After the retreatment, Tweed observed that the occlusion was much more stable. This gave rise to the Tweed philosophy owing to the scientific evidence he provided towards extraction treatment modality.

Extractions were eventually accepted into orthodontics.

During the same period, Raymond Begg in Australia was developing an appliance system based on therapeutic extraction as well. His appliance was based on the theory of attritional occlusion. This theory was strengthened by Professor Stockard's breeding experiments which indicated that malocclusion could be inherited, rather than developing the potential within each patient. It appeared necessary for the orthodontist to recognize genetically determined disparities between tooth size & jaw size, or to acknowledge that the lack of proximal wear on teeth produced tooth size – jaw size discrepancies during development. In either case, extraction was frequently necessary.

The era of 1970-1990's saw the revival of non-extraction treatment. There came a period in orthodontics when premolars were extensively being extracted for correction of malocclusion with Tweed edgewise philosophy and the Begg appliance. This resulted in unattractive facial features. Subsequently, facial harmony and esthetics was given more importance by orthodontists thereby reducing the rate of indiscriminate premolar extractions. Studies by Little et al in 1981 and Mc Reynolds et al in 1991, supported the fact that premolar extraction does not guarantee stability of tooth alignment. Overtime, change from fully banded to largely bonded appliances made it easier to expand arches, therefore, border line case were generally treated better without extraction.

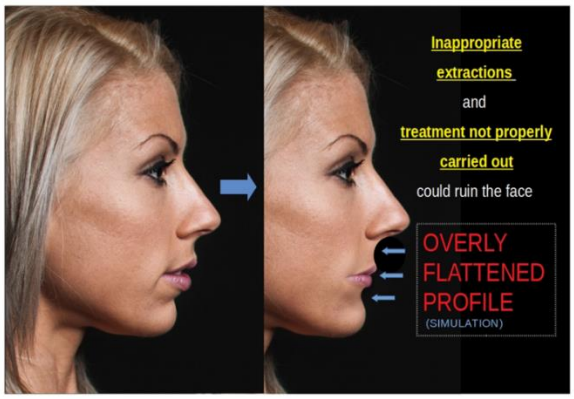
Hence extraction of teeth for orthodontic purposes was rare in the early 20th century, peaked in the 1960s, declined to about the levels of the early 1950s, in 1990s, and has remained there for first few years of the 21st century.



REASONS FOR CONTROVERSY

Facial Profile

The major concern in choosing between extraction and non-extraction treatment modality is the effect it has on the soft tissue profile of the patient. Non extractionists believe that extractions result in “dish in” of the face, while extractionists claim that without extractions in certain cases the periodontal health will be compromised and the profile will appear full. Studies conducted by Rushing et al in 1995, Stephens et al in 2005 and Erdinc et al in 2007, support the fact that general dentists and orthodontists were unable to distinguish between the facial profiles of subjects treated with extraction and non-extraction.A three-dimensional soft-tissue analyses by Solem et al in 2013 following treatment by extraction revealed that, distinct changes were observed in patients who had protrusion, and the retraction of the lip was directly associated with retraction of the upper and lower incisors.Therefore, extraction in few patients with fuller profiles, does not necessarily cause “dish-in” of the face, and in fact can result in better esthetics than non-extraction treatment in such patients. Hence, clinicians have to plan the cases suitably, to avoid over-retraction of the anterior segment leading to unfavourable profile changes. The mandible grows more than the maxilla, which tends to straighten the profile over-time, throughout adulthood. This was attributed to the fourth dimension ‘’time’’, as termed by Sarver and Ackerman in 2003



Extractions & Temporomandibular Joint Disorders (TMD)

A radical district court case in 1987, involved a sixteen year-old girl, diagnosed with Angle’s Class II, division 1 malocclusion. Her orthodontist planned the treatment with premolar extractions and the use of headgear. Subsequently, her family claimed that the treatment had caused TMD and sued the orthodontist. Their family dentist debated that the extractions and use of headgear caused excessive incisor retraction resulting from distal displacement of the mandible and thereby, internal derangement. The orthodontist was convicted by the jury for mistreatment, and the case was widely conversed among the dental professionals. Most orthodontists did not believe that premolar extractions could lead to

TMD, yet their fear of malpractice suits was heightened if they advocated extraction treatment modality. In the early 1990s, the orthodontic scientific community took charge and put forth high-quality evidence stating that there is no direct relationship between TMD and orthodontic treatment. The literature also discusses and supports the contention that any type of orthodontic treatment has a neutral effect.

Buccal Corridors

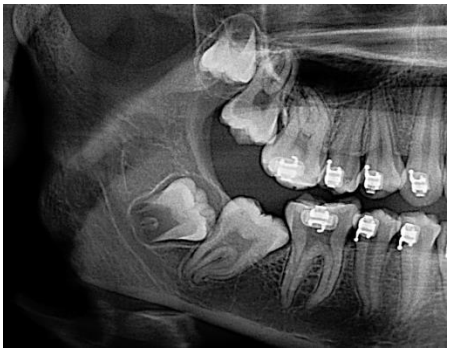
Few orthodontists are of the belief that extracting maxillary premolars leads to narrowing of the dental arch, resulting in broader buccal corridors which is not esthetic.

To the contrary, studies by Janson et al in 2011, Ioi et al in 2012, and Meyer et al in 2014 are of the opinion that the dental arch does not become narrow with maxillary premolar extraction and more importantly, broader buccal corridors are not always unattractive.23,24

Stability and Impaction Risk

In 1999, Bowman cautioned that adhering to a non–extraction protocol would not always be the best for many patients. Since the patients most likely to experience ineffective orthodontic treatment are those with crowding and protrusion, a non-extraction approach may not provide optimum esthetics, function, periodontal health, and stability in such cases. On the contrary, Erdinc et al in 2006, suggested that the extraction of premolars for orthodontic treatment to alleviate crowding may not enhance stability.

According to Casetta et al 2013, an increased prevalence of mandibular second-molar impactions may be correlated with the increasing fame of non-extraction therapy. A study by Turkuz et al in a Turkish population in 2013 associated increased risk of third-molar impactions with non-extraction protocols. 81.8% of the patients who did not undergo extractions had impacted third molars, compared to 63.6% of the patients who underwent premolar extractions. Saysel et al in 2005, found angulation of third molars to be more favorable, as well as increased third-molar eruption space, following extraction treatment.



Current trends in extraction controversy

Bonding

Bonding of fixed appliances that replaced banding to quite an extent, permitted non-extraction treatment in more patients, since band thicknesses tended to promote crowding.

Airotor Stripping (ARS)

Dr. Jack Sheridan promoted ARS or interproximal enameloplasty.

He believed that if nature could reduce the interproximal enamel, without resulting in increased caries risk or periodontal problems, orthodontists could also do the same, if they exploit the advantages of full-arch bonding, which opens the interproximal areas and allows for reshaping. Around 6-8mm of the space can be gained to resolve protrusion, crowding or a combination of both.

Expansion

Expansion has been promoted since long to treat posterior crossbite. In the 1980s, it became popular as a substitute to extraction treatment to resolve crowding even without the presence of posterior crossbite. Advocates of rapid maxillary expansion (RME) claim resolving of borderline crowding of 3-6mm in the mandible in patients with narrow transpalatal widths. They contend that RME will result in reciprocal mandibular expansion because the mandibular arch form is dictated by the maxillary arch form**.** McNamara Jr. et al reported that a favourable change in the sagittal occlusal relationships between maxillary and mandibular teeth can be facilitated by RME. Fields cautioned that "to date, there is no credible long-term post retention evidence that early intervention to prepare, develop, balance, or expand arches by any other name has any efficacy in providing a less crowded permanent dentition later".

Stability of expansion, particularly in the mandible, has little evidence demonstrating the same. Many authors support the contention that intercanine expansion is unstable. A study by Housley et al in 2003 concluded that in patients who underwent mandibular expansion, intercanine widths were maintained in only 8% of patients, for six years and three months after fixed retention. Additionally, prospective complications of expansion include the risks of creating a dehiscence (loss of alveolar bone on the facial aspect of a tooth that leaves a characteristic oval, root-exposed defect from the cementoenamel junction apically) as a result of overexpansion. Anterior teeth tend to move labially, when treated by expansion of the arches to alleviate moderate-to severe crowding. Extractions on the other hand , allow the teeth to move along the alveolus.

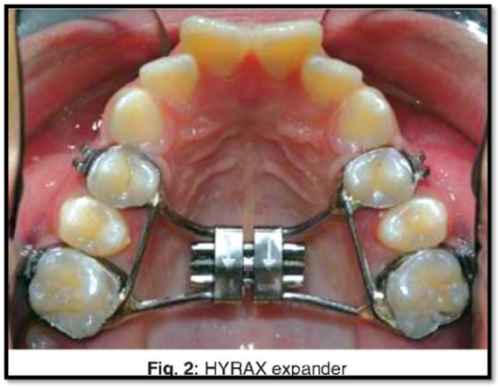


Fig. 2: HYRAX expander

Self-Ligating Brackets

There have been assertions that the efficacy and effectivity of self-ligating

brackets is better than conventional brackets. It reduces treatment time and avoids the need for extractions in most cases. From an evidence-based standpoint, self-ligating brackets are as beneficial as conventional brackets except for two advantages they offer: reduced chairside time (insertion and removal of wire is easy), and control of mandibular incisor proclination.

Preservation of Leeway Space

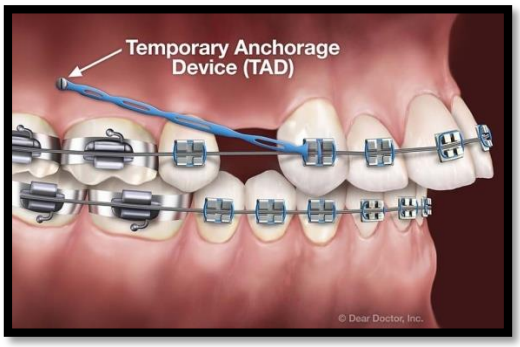
According to Gianelly, about 75% of Class I and II cases with mild-to-moderate crowding can be treated without expansion or extractions. This can be done by conserving the leeway space of the primary second molars, also called as E-space. Brennan and Gianelly observed that, in the mixed dentition, around 5mm of crowding in incisor region can be resolved with the use of a lingual arch. In cases of moderate-to-severe crowding, coupled with protrusion , in which leeway space has been lost, molars have drifted forward, and expansion is no longer an option, extraction may be the only choice of treatment.

Autonomy

The patients in this era are more actively involved in their treatment decisions than at any timepast. The fear of pain and loss of teeth overpowers the patient's thinking. Unfortunately, this may result in a competing practitioner to offer a more "conservative" non-extraction option, even if it is not in the best interest of the patient.

Introduction of mini-implants and bone screws

After the introduction of temporary anchorage devices, the pendulum of extraction has shifted to non-extraction since they broaden the envelope of discrepancy and are instrumental in correcting many skeletal malocclusions.



CONCLUSIONS

Although it is unlikely that the extraction debate will ever be completely resolved, the vast majority of practicing orthodontists currently accept that extractions are a necessary part of our treatment-planning bag of tricks, and that certain cases are best treated with extractions. Identifying guidelines for the extraction vs non-extraction decision in orthodontic treatment is a complex task. Presently, the controversy is not afflicted by as much beliefs as it was almost 100 years ago and both treatment options are still open. The option to treat with extraction or non-extraction should be made objectively for each case based on strong evidence with equal attention on the soft tissue paradigm.

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CASE 1

A 14 year old girl, Purva Shinde reported to the department of Orthodontics with a chief complaint of malaligned upper front teeth of the jaw.

EXTRA-ORAL EXAMINATION

- Mesoproscopic
- Incompetent and protrusive lips
- Deep mentolabial sulcus

INTRA-ORAL EXAMINATION:

- Peg shaped laterals, anterior crossbite w.r.t 11
- Moderate crowding in upper arch
- Severe crowding in lower arch
- Class I canine and molar relationship
- Proclined upper and lower anteriors

MODEL ANALYSIS FINDINGS

- Overjet – 4 mm
- Overbite – 4 mm
- Space requirement in upper arch- 6 mm
- Space requirement in lower ach – 12 mm

CEPHALOMETRIC FINDINGS

SNA- 83°
SNB – 80°
ANB- 3°

FH-MP- 37°
Y-growth axis- 63°
Base plane Angle- 27°

U1 to NA- 27° IMPA-101°
L1 to NB- 37° Interincisal angle- 112

Nasolabial angle – 92° S Line – +2, +4 mm
Angle of convexity – 6° E Line - +1, +3 mm

DIAGNOSIS

- **Skeletal-**
  - Transverse - Normal arches
  - Sagittal - Class I with Orthognathic maxilla and Orthognathic mandible
  - Vertical - Average to Vertical growth pattern**.**
- **Dental -** Angle's class I Type 3 malocclusion, Peg shaped laterals.
- **Soft tissue** - Convex profile

PRIORITIZED PROBLEM LIST

- Peg shaped laterals
- Proclined upper and lower anteriors
- Crowding in upper and lower anteriors
- Class II canine relationship
- Unaesthetic soft tissue profile

TREATMENT OPTIONS

- Extraction of all four first premolars
- Extraction of upper peg laterals and lower first premolars
- Extraction of all second premolars

TREATMENT PLAN

- Extraction of upper peg laterals and lower first premolars

Since the space requirement in the upper arch was limited and to avoid increasing the therapeutic difficulty in restoring the peg laterals after achieving adequate space, the second treatment option was chosen as the most suitable one

ALIGNMENT AND LEVELLING AND SPACE CLOSURE

POST TREATMENT

After a treatment duration of 14 months, ideal overjet, overbite, and excellent

intercuspation was achieved. Facial balance improved and the lips were now competent.

Other Indications of lateral incisor extraction

- Dilacerated
- Unfavourably impacted
- Periodontally compromised
- Deep carious lesion
- Severely blocked out
- Missing lateral incisor of the opposite side to maintain symmetry

CASE 2

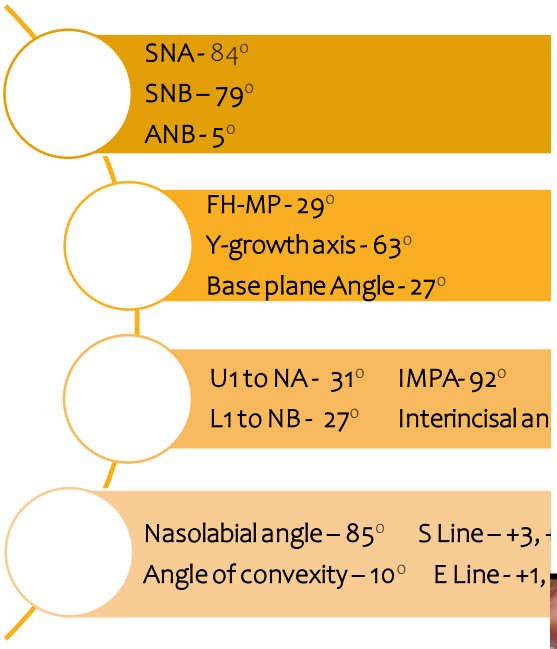
A 22 year old lady, Sampada reported to the department of Orthodontics with the Chief complaint of forwardly placed upper front teeth of the jaw. Extra-oral examination revealed convex profile, incompetent lips and slightly retruded chin.

Intra-oral examination revealed

- Increased overjet
- Mild crowding in lower anteriors
- Proclined upper and lower anteriors
- Class II canine and molar

- Overjet – 10 mm
- Overbite – 5 mm
- Space requirement in upper arch- 10 mm
- Space requirement in lower ach – 6 mm

CEPHALOMETRIC FINDINGS



DIAGNOSIS

- **Skeletal-**

Transverse - Normal arches

Sagittal - Class II with Prognathic maxilla and Orthognathic mandible

Vertical - Vertical growth pattern.

- **Dental** - Angle's class II Div 1 malocclusion.
- **Soft tissue** - Convex profile

PROBLEM LIST

- Mild crowding in lower anteriors
- Proclined upper and lower anteriors
- Increased overjet
- Class II canine and molar relationship
- Unaesthetic soft tissue profile

TREATMENT OPTIONS

- Extraction of all four first premolars
- Extraction of upper first and lower second premolars
- Extraction of upper first and lower single incisor

TREATMENT PLAN

•Extraction of upper first and lower single incisor

ALIGNMENT AND LEVELLING AND SPACE CLOSURE

POST-TREATMENT

After a period of 16 months, ideal overjet and overbite and good intercuspation was achieved. The case was finished with a Class II molar relationship on both sides which has been considered functionally stable.

The patient now had a straight profile, competent lips and improved facial appearance.

CONCLUSION

- Extractions are just a tool, not good or bad in themselves.
- Used right, they improve the quality of treatment, used wrong they may create a poor result."
- The outcome of orthodontic treatment is just the tip of the iceberg, the actual prowess lies in its decision making.

CASE PRESENTATIONS

By- Dr. Anchal Karemore

Third year Postgraduate student

Department of Orthodontics

Introduction:

Extraction of teeth as part of the orthodontic treatment has been a matter of controversy. Teeth are extracted for several reasons in orthodontics. The most common reason for extractions is to provide space for alignment of the crowded teeth. The reduction of overbite and the correction of an increased over jet to obtain a Class-I incisor & molar relationship are also important issues to consider in cases where extractions are required.

The choice of teeth to be extracted depends on:

- **The direction of jaw growth.**
- **The amount of discrepancy between the size of dental arches and the basal arches.**
- **The antero-posterior position of the teeth in the jaws in relation to facial lines.**
- **The presence of orthognathic or prognathic facial profile.**
- **The degree of alveolodental protrusion.**
- **The age of the patient and**
- **The health of the dentition as a whole.**

Proffit's recommendation of various extraction patterns

Space From Various Extractions					
Extraction	Relief of incisor crowding	Incisor Retraction		Posterior Forward	
		Max	Min	Max	M
Central Incisor	5	3	2	1	(
Lateral Incisor	5	3	2	1	(
Canine	6	5	3	2	(
First Premolar	5	5	2	5	2
Second Premolar	3	3	0	6	4
First Molar	3	2	0	8	(
Second Molar	2	1	0	-	-

Cases

Case 1: Achal

20/f

Chief complaint: Patient reported with a chief complaint of forwardly placed upper front teeth of the jaw.

Pre t/t extraoral photographs

Pre t/t intraoral photographs

Diagnosis:

Skeletal Class I with orthognathic maxilla and Mandible

Dental: Angles Class I type 2 malocclusion

Soft tissue: Convex Profile

Problem list

- Proclined upper and lower anteriors
- Spacing in the upper anteriors
- Supernumerary tooth between 25 and 26
- Unaesthetic soft tissue profile

Treatment plan

Extraction of Upper and lower First premolars.

Post t/t extraoral photographs

Post t/t intraoral photographs

Case 2: Renuka

15/f

Chief Complaint: Patient reported with a chief complaint of forwardly placed upper front teeth of the jaw.

Pre t/t extraoral photographs

Pre t/t intraoral photographs

Diagnosis:

Skeletal Class II with orthognathic maxilla and retrognathic Mandible

Dental: Angles Class II type 1 malocclusion

Soft tissue: Convex Profile

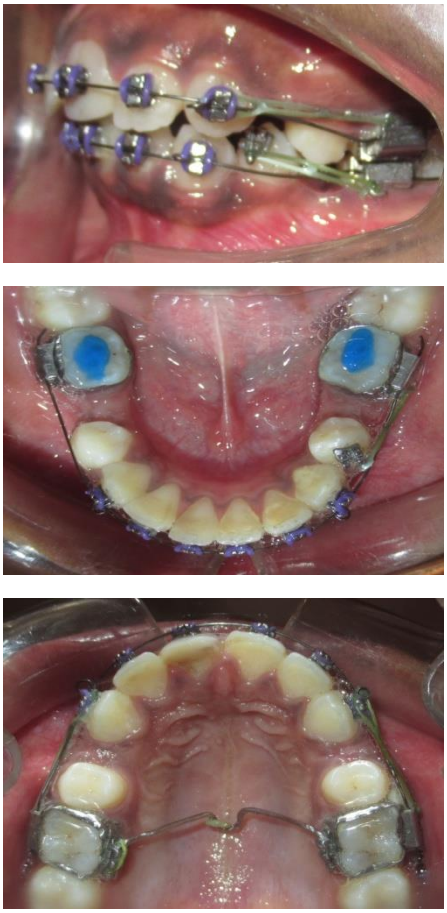
Problem list

- Proclined upper and lower anteriors
- Fractured and discolored 21
- Class II molar and canine relationship
- Rotated 34
- Unaesthetic soft tissue profile

Treatment plan

Extraction of Upper first and lower second premolars.

Progress extraoral photographs



Progress intraoral photographs

Case 3: Mohini

21/f

Chief Complaint: Patient reported with a chief complaint of forwardly placed upper front teeth of the jaw.

Pre t/t extraoral photographs

Pre t/t intraoral photographs

Diagnosis:

Skeletal Class I with orthognathic maxilla and Mandible

Dental: Angles Class I type 1 and 2 malocclusion

Soft tissue: Convex Profile

Problem list

- Proclined upper and lower anteriors
- Extracted 36 and 46
- Unaesthetic soft tissue profile

Treatment plan

Extraction of Upper First premolars

Progress intraoral photographs

CASE PRESENTATIONS

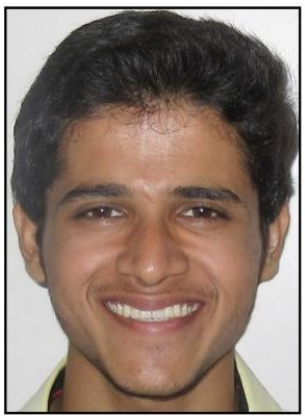
By- Dr. Razick Nishad

Third year Postgraduate student

Department of Orthodontics

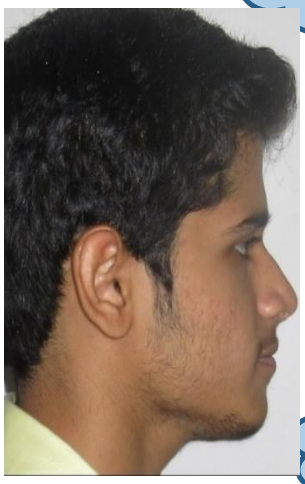
Case 1 Pt Name: Pawan Hargunani

22/M



Strght profile

Equal facial proportions



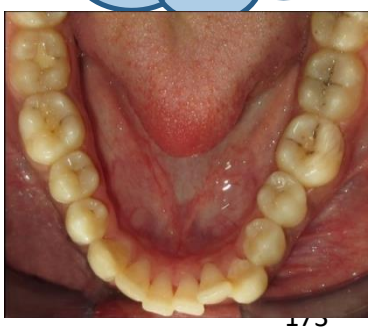
Shallow mentolabial sulcus

Reduced overbite and overjet

Class I molar and canine relation

Crossbite irt 22 & 33

Mild lower anterior crowding



➢ **Dental analysis**

- Molar relationship – Class I
- Canine relationship – Class I
- Overjet – 0 mm
- Overbite – 0 mm
- Space requirement in upper arch –
- Space requirement in lower arch – 4 mm

➢ **CephalometricAnalysis**

- SNA - 82
- SNB – 81
- ANB - -1
- FH-MP - 25
- Y-growth axis - 57
- Base plane Angle - 24
- Nasolabial angle – 95 S Line – -4, -2
- Angle of convexity – 0 E Line - 0,0

❑ **Alignment & levelling**

➢ **Diagnosis**

❑ **Skeletal-**

- Transverse - Normal arches
- Sagittal - Class I with Orthognathic maxilla and mandible
- Vertical - Average to Horizontal growth pattern.

❑ **Dental** -Angle's class I Type 3 malocclusion,

❑ **Soft tissue** - Straight profile

➢ **Problem list**

- Correction of lower anterior crowding
- Correction of crossbiteirt 22 & 33
- Achieve ideal overjet and overbite

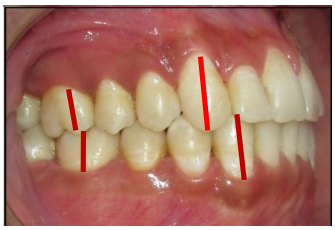
➢ **Treatment plan**

- Class III camouflage with lower single incisor extraction

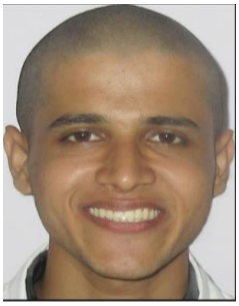


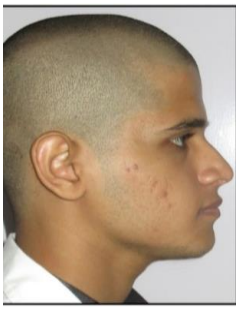


❑ **Post treatment**



❑ **Post treatment**



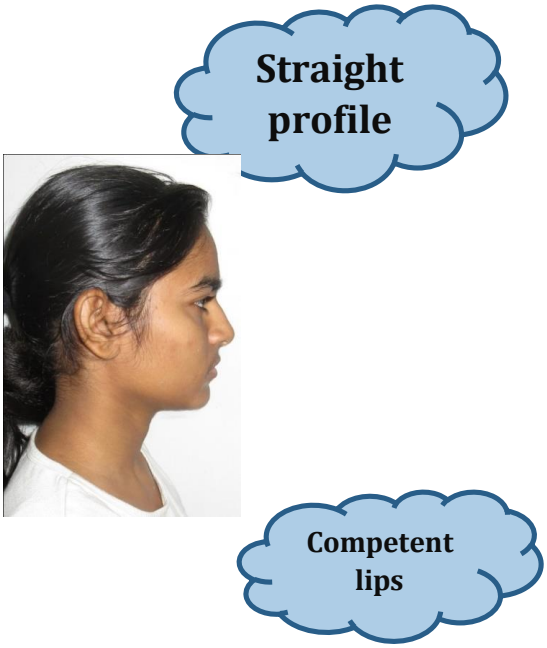


- Indication of single incisor extraction
- Bolton excess in mandibular anteriors

- Anomalies in number of teeth
- Ectopically erupted incisors
- Moderate class III cas

❖ **Case 2**

Patient reported with a chief complaint of malaligned upper front teeth of the jaw.



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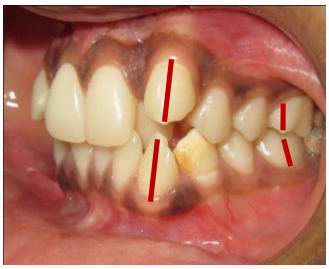
Upper anteri



Class II molar

Class I molar

Lower anterio

➢ **Dental analysis**

- Molar relationship – Class II (L) Class I (R)
- Canine relationship – End on
- Overjet – 2 mm
- Overbite – 3 mm
- Space requirement in upper arch – 11 mm
- Space requirement in lower arch - 6 mm

➢ **CephalometricAnalysis**

- SNA - 83
- SNB – 80
- ANB - 3
- FH-MP - 32
- Y-growth axis - 58
- Base plane Angle - 25
- U1 to NA - 22 IMPA- 95
- L1 to NB - 25 Interincisal angle - 130
- Nasolabial angle – 95 S Line – -2, 0
- Angle of convexity – 8 E Line - +1, +3

➢ **Diagnosis**

❑ **Skeletal-**

- Transverse - Normal arches
- Sagittal - Class I with Orthognathic maxilla and Orthognathic mandible
- Vertical - Average to Horizontal growth pattern.

❑ **Dental** -Angle's class II Div 2 subdivision right malocclusion

❑ **Soft tissue** - Straight profile

➢ **Problem list**

- Crowded upper anteriors
- Crowded lower anteriors
- Class II Canine and molar relation
- Unesthetic soft tissue profile

➢ **Treatment plan**

Extraction of Upper first premolars , lower First premolars on Class I side and Second premolar on class II side

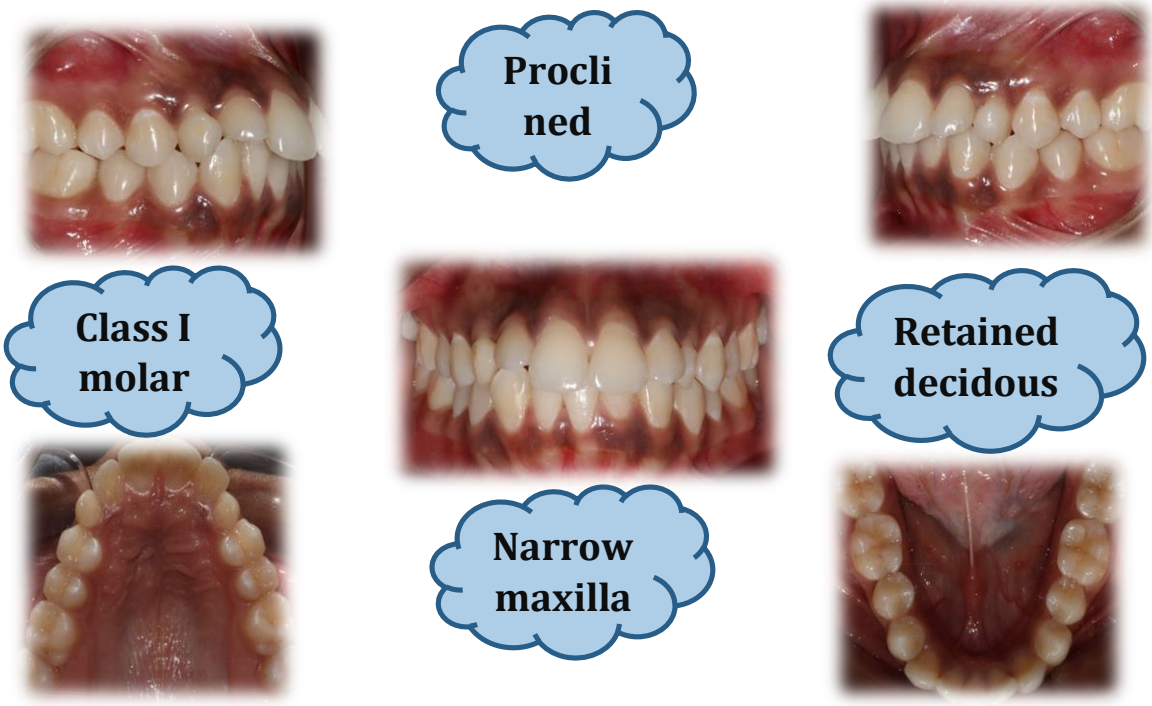
❑ **Alignment & levelling**

❑ **Post- treatment**

❑ **Post- treatment**

❖ **Case 3**

Patient reported with a chief complaint of forwardly placed upper front teeth



➢ **Dental analysis**

- Molar relationship – Class I
- Canine relationship – Cannot be assessed
- Overjet – 3 mm
- Overbite – 2 mm
- Space requirement in upper arch – 18 mm
- Space requirement in lower arch – 16 mm

➢ **CephalometricAnalysis**

- SNA – 84.5
- SNB – 79.5
- ANB - -5
- FH-MP - 34
- Y-growth axis - 62.5
- Base plane Angle - 34
- FH-MP - 34
- Y-growth axis - 62.5
- Base plane Angle - 34
- Nasolabial angle – 85 S Line – +4,+6
- Angle of convexity – 6 E Line - +1,+4

➢ **Diagnosis**

❑ **Skeletal-**

- Transverse - Normal arches
- Sagittal - Class I with Orthognathic maxilla and Orthognathic mandible
- Vertical - Average to Vertical growth pattern.

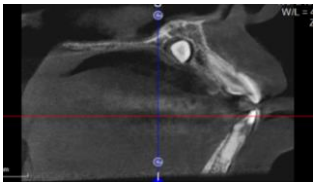
❑ **Dental** -Angle's class I Type 2 malocclusion

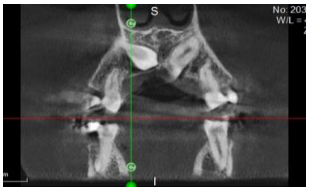
❑ **Soft tissue** - Convex profile

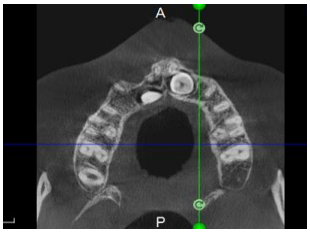
➢ **Problem list**

- Narrow maxillary arch
- Clinically missing 13,23
- Overretained 53,63
- Missing 42
- Proclined upper and lower anteriors
- Crowding in lower anteriors
- Unesthetic soft tissue profile

➢ **Problem list**







- **Treatment plan**

Extraction of 53,63,13,23, 44 and fixed mechanotherapy

- **Treatment plan**

Case is under progress

Extraction of 53,63,13,23, 44 and fixed mechanotherapy

DEPT OF ORAL AND MAXILLOFACIAL PATHOLOGY

Salivary Glands- A Brief Introduction

Name: Dr Prabhanshu Srivastava

Guided by: Dr Suchitra Gosavi

Dept of Oral and Maxillofacial pathology

Introduction:

Salivary Glands in mammals are exocrine glands.

produce saliva through a system of ducts.

Humans have three paired major salivary glands (parotid, submandibular, and sublingual) as well as hundreds of minor salivary glands.

Salivary glands can be classified as serous, mucous or seromucous (mixed).

Development of Salivary Glands:

All Salivary glands arise from the ectoderm of the oral cavity.

The primordial of the parotid and submandibular glands of human appear during the 6th week, whereas the primordium of the sublingual gland appears after 7 to 8 weeks of fetal life.

The minor salivary glands begin their development during the 3rd month of fetal life.

Branching Morphogenesis-Clefts develop inti buds, forming two or more new buds, continuation of this process is called branching morphogenesis

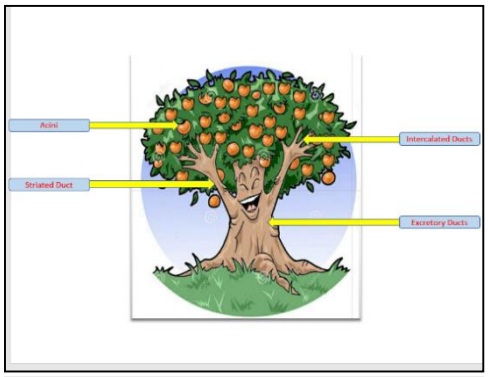
Signalling molecules- Factors that control the location of the branch points an the overall structure of the gland. Ex fibroblasts growth factor family, sonic hedgehog, transforming growth factor beta etc

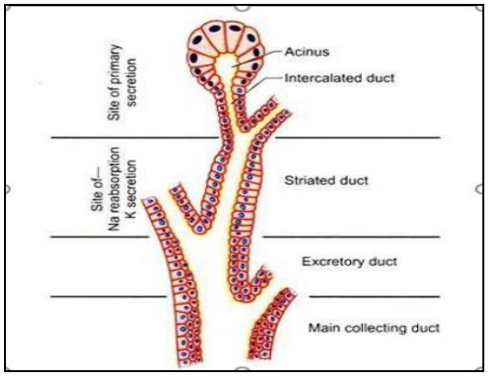
- Following the development of lumen, epithelium consists of two layers.
- Inner layer develops into secretory cells of mature gland, mucous or serous
- Outer layer- Contractile myoepithelial cells.
- Thick partitions of the connective tissue septa will divide the gland into lobes and lobules.

Structure of Secretory Unit:

The basic functional unit is the terminal secretory unit called acini.

The serous, mucous along with myoepithelial cells are arranged in an acinus or acini with roughly spherical or tubular and a central lumen.





- These are pyramidal shaped cells.
- These cells have Spherical nucleus at basal layer
- Apical cytoplasm of these secretory cells contain granules known as zymogen granules.
- Mature granules stored at the apex and emptied into the lumen by process of exocytosis
- Membrane of granule fuses with the plasma membrane and the content is secreted outside of the cells.
- Chain of granules may be secreted, which appears as string of pearls, by a process known as compound exocytosis.
- Ultrastructural feature is these cells are typical of a protein secreting cell.

MUCOUS CELLS :

- Similar to serous cells, mucous cells are specialized for the synthesis, storage and secretory product.
- Structure is different
- Nucleus is compressed against the base of the cell
- Differ secretion;

1. Little or no enzymatic activity, mainly lubrication
2. Ratio of carbohydrate to protein is high
3. PAS or Alcian blue for demonstration.
4. Mechanism of secretion: Single droplet is discharged, with limiting membrane
5. Separating membrane is then lost discharging the mucous in the lumen

Serous Cells:

MYOEPITHELIAL CELLS:

These cells are closely related to secretory and intercalated ducts.

These are stellate or spider like cells, with flattened nucleus that embrace the secretory and ducts cells

Their appearance is similar to a **Basket cradling the secretory unit** hence the term **basket cells** is used for these cells.

They are similar to smooth muscles but their origin is different as they are actually derived from the epithelium

Myoepithelial cells are located around the terminal secretory units and first portion of the ductal system

Function:

- Initial flow of saliva
- Maintains the patency of the intercalated ducts
- Contribute to secretory pressure in the acini or duct
- Support the underlying parenchyma
- Help salivary flow to overcome increase in peripheral resistance of the ducts

Thank You

TUMORIGENESIS

Name: Dr Abhinandh Krishna

Guided by: Dr Suchitra Gosavi

Dept of Oral and Maxillofacial pathology

- Histogenetic Concept- [Histos (A combining form denoting relationship to tissue) + Genesis (Production)]
- In Pathology, this term has become synonymous with the **"cell of origin" for a neoplasm** rather than the developmental process underlying the tumor.

a. Basal reserve cell theory

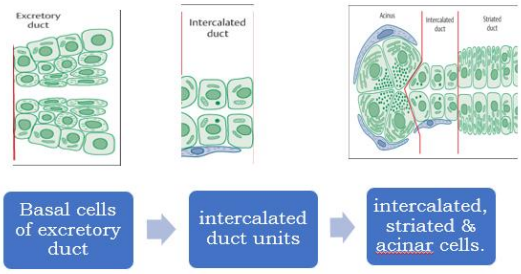
b. Semipluripotential bicellular reserve cell theory

c. Multicellular theory

a. Basal cell theory

b. Semipluripotential Bicellular Reserve Cell Theory:

- specific reserve or basal cells of the excretory & intercalated ducts or both are responsible for replacement of all types of cells in the normal gland. (Eversole 1971)
- Hence are the sole source of neoplastic transformation.
- Basal cells of excretory duct ➡ intercalated duct units intercalated, striated & acinar cells.



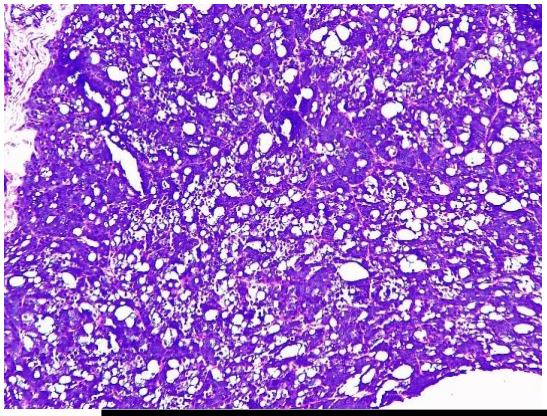
c.Multicellular Theory (Dardick et al 1990):

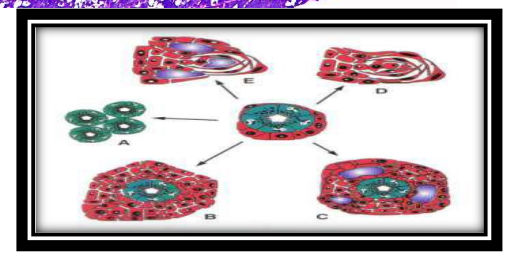
differentiated cells at all levels of glands are capable of cell division &

thus are responsible for tumor formation

b. **Morphogenetic concept**
For pathologists, this definition represents the process of differentiation inherent in neoplasms & the resulting histopathology characteristics for that particular tumor.

Morphogenetic approach is unconcerned with tumor initiation processes.



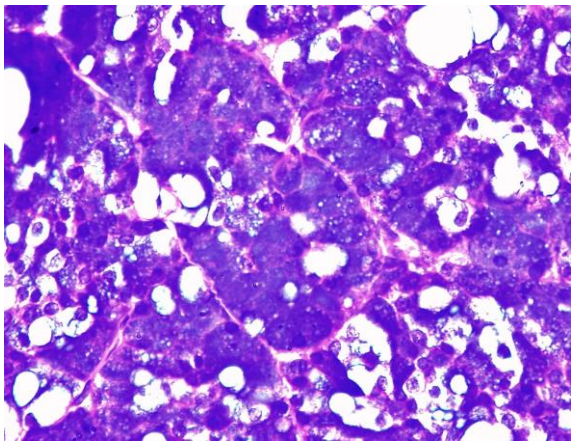


Acinic cell carcinoma

Acinic cell carcinoma (ACC) is a low-grade malignant salivary neoplasm that constitutes approximately 17% of primary salivary gland malignancies. In the head and neck region, the parotid gland is the predominant site of origin and women are usually more frequently diagnosed than men. Previous radiation exposure and familial predisposition are some of the risk factors for ACC. A slowly enlarging mass lesion in the tail of the parotid gland is the most frequent presentation. The diagnosis is usually confirmed with a fine needle aspiration biopsy, and surgical excision is the main treatment of this malignant neoplasm.

Case report

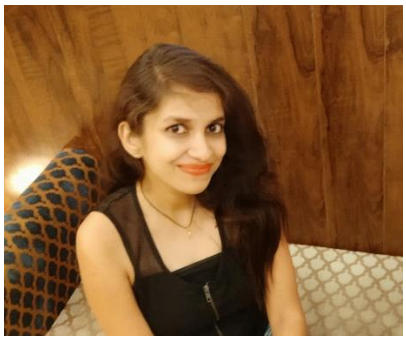
- ✓ A patient of age 72 male came with the chief complaint of swelling in the left side of face since 2 years. On clinical examination Multiple extraoral swellings was appreciated on preauricular, post auricular and masseteric region. Consistency was fluctuant. Lt SMLN was Palpable of approx size 2cm x 2cm, mobile, tender on palpation. FNAC was carried out which was suggestive of salivary gland malignancy. CT scan was done which was suggestive of malignancy of parotid gland



Discussion

Although indolent in nature (slow-growing), ACCs are quite persistent in their potential for local recurrences and distant metastases, often many years later. Local and multiple recurrences may occur in up to half of patients. Recurrences and metastases after 3 to 10 years are common, especially after inadequate primary tumor removal. Recurrences more than 20 or 30 years after initial treatment are also noted in the literature.[3] Due to the notably high tendency of ACC to recur and to produce latent metastasis, long-term follow-up is mandatory after treatment

NECROTISING SIALOMETAPLASIA



Name: Dr Aishwarya Naik

Guided by: Dr Suchitra Gosavi

Dept of Oral and Maxillofacial pathology

NECROTISING SIALOMETAPLASIA

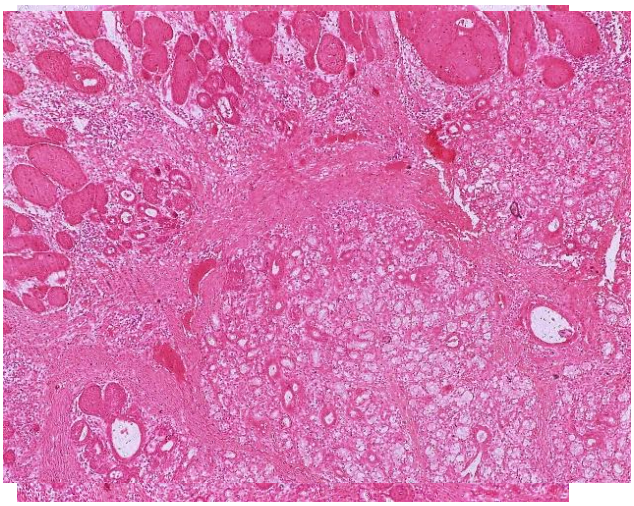
Necrotising sialometaplasia is an uncommon, locally destructive, inflammatory condition of salivary glands. Cause of this condition is unkwown but many authors belive it is the result of ischemia of salivary glands. The condition appears initially as nonulcerated swelling with pain or paraesthesia. Within 2 to 3 weeks necrotic tissue sloughs out, leaving a crater like ulcer that range from 1 cm to 5 cm. It shows strong predilection with cigarette smoking.The importance of this lesion rests in the fact that it mimics a malignant process both clinically and microscopically.

The following report describes a rare case where the patient reported with ulceration on palate.

Introduction: The salivary gland most commonly involved is palatal salivary gland and hard palate affected more often than soft palate. Occurs most commonly in adults with mean age is 46 years. Males are affected as twice often as females. Patient exhibits clinical manifestations like early local pain, ulceration on palate with crater like border.

Case Report: A 34 year old male patient reported to our department with a chief complaint of ulceration on palate since 14 days. Past medical history, past dental history, family history are not contributory but patient had a habit of smoking cigarette since 10 years 5-6 times in a day. Physical examination revealed 1cm × 2cm ulcerated lesion, with an everted border, reddish pink in colour, slightly tender. There was no H/O bleeding or pus discharge. No other relevant finding on general examination.

Incisional biopsy was done and the histological picture shows features like islands of squamous epithelium infiltrating into underlying connective tissue stroma, small and large islands are seen entrapped within connective tissue stroma. On this basis a diagnosis of squamous cell carcinoma can be made. At one point in tissue we can appreciate salivary gland



tissue. On examining this region at high power view we see salivary gland acinar necrosis with some squamous islands at periphery. So the squamous islands we see are not true infiltration but are pseudoepithelomatous hyperplasia. Therefore pseudoepitheliomatous hyperplasia along with acinar necrosis confirms the diagnosis of necrotising sialometaplasia.

Discussion: Squamous cell carcinoma is the most common lesion which we

encounter in oral cavity. Necrotising sialometaplasia is a lesion that mimics squamous cell carcinoma both clinically and microscopically so a keen observation is very important in histopathology as these lesions though appear same but are totally different entity. So the treatment planning can be done accordingly as management is totally different for these two different lesions. No specific treatment for necrotising sialometaplasia the lesion usually resolves on its own with healing time of 5 to 6 weeks.

PLEOMORPHIC ADENOMA

Name: Dr Archana Marllapale

Guided by: Dr Suchitra Gosavi

Dept of Oral and Maxillofacial pathology

Introduction:

The pleomorphic adenoma, or benign mixed tumor. Is easily the most common salivary neoplasm. It accounts for 53% to 77 % of parotid tumors, 44% to 68 % of submandibular tumors and 38 % to 43% of minor gland tumors. Pleomorphic adenomas are derived from a mixture of ductal and myoepithelial elements. A remarkable microscopic diversity can exist from one tumor to the next. As well as in different areas of the same tumor. The term pleomorphic adenoma and mixed tumor both represent attempts to describe this tumor's unusual histopathologic features. but neither term is entirely accurate. Although the basic tumor pattern is highly variable. Although the tumor often has a prominent mesenchyme appearing “stromal " component, it is not truly a mixed neoplasm that is derived from more than one germ layer. It primarily involving

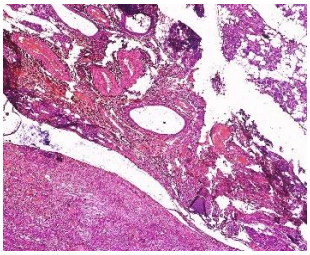
pleomorphic adenoma gene 1 (PLGA1) located at chromosome region 8_q12.

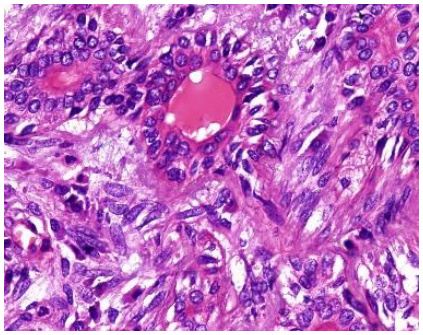
The pleomorphic adenoma typically appears as a painless. slowly growing, firm mass. The tumor can occur at any age but is most common in young adults between the ages of 30 and 50. There is a slight female predilection. Most pleomorphic adenomas of the parotid gland occur in the superficial lobe and present as a swelling overlying the mandibular ramus in front of the ear. Facial nerve palsy and pain are rares. About 10% of parotid mixed tumors develop within the deep lobe of the gland beneath the facial nerve. Sometimes the se lesions grow in a medial direction between the ascending ramus and stylomandibular ligament. resulting in a dumbbell -shaped tumor that appears as a mass of the lateral pharyngeal wall or soft palate, the palate is the most common site for minor gland mixed tumors, accounting for approximately 60% of intraoral examples. This is followed by the upper lip (20%) and buccal mucosa (10%). Palatal tumors almost always are found on the posterior lateral aspect of the palate, presenting as smooth-surfaced, dome shaped masses.

Case Report:

65yr male complain of swelling on the left side of the face since 3 months, his past medical history, past dental history, family history, habit history are not contributory. There was complain of well-defined swelling present on left side of preauricular region of approx. in size 5×4cm, firm in consistency, non-mobile, non-tender on palpation. There was no H/O of bleeding or pus discharge. While lips are competent. No abnormalities detected in TMJ. Lymph node are not palpable.

Received surgically excised soft tissue specimen of approx. size 7×6cm.Greyish white in colour, firm in consistency, surface is smooth on palpation. On cross section shows pale smooth & dense surface. On histopathological examination, in scanner view shows a capsule which differentiate the normal salivary gland and tumour mass and indicates that it is benign tumour, on scanner view it show presence of multiple duct like structure surrounded by glandular epithelium, filled with eosinophilic coagulum, two different types of cell population are appreciated first one is glandular epithelium arranged in duct like pattern filled with eosinophilic coagulum, another is spindle like cell are known as myoepithelial cell. Part of tissue section also show myxoid and stromal component.





Discussion: Pleomorphic adenomas are best treated by surgical excision. For lesions, In the superficial lobe of the parotid gland. Superficial parotidectomy with Identification and preservation of the facial nerve is recommended. With adequate surgery, the prognosis is excellent, with a cure rate of more than 95%.The risk of malignant transformation is probably small, but it may occur in as many as 5% of all cases.

Epithelial-myoepithelial carcinoma

Name: Dr Niharika Mistry

Guided by: Dr Suchitra Gosavi

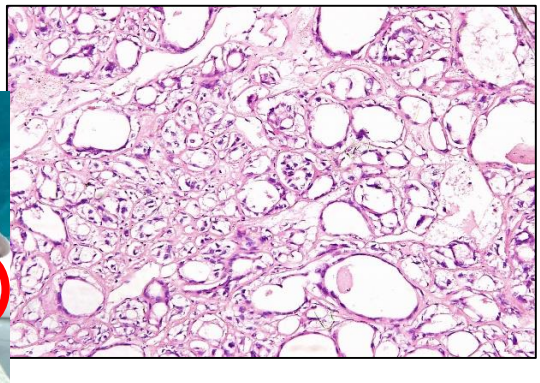
Dept of Oral and Maxillofacial pathology

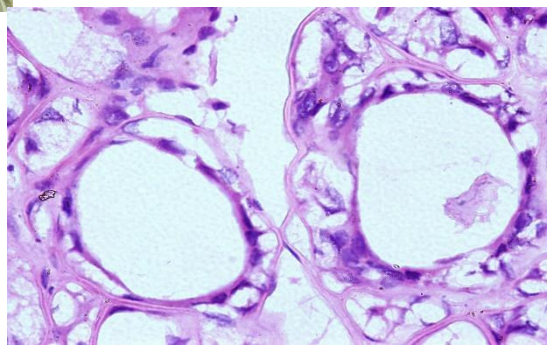
Introduction- Epithelial-myoepithelial carcinoma is a malignant tumor composed of ductal structures lined by a single layer of ductal cells that are surrounded by a single or multiple layers of clear myoepithelial cells. The peak incidence is in the sixth and seventh decades (mean age 61 years), with a slight female predominance. Approximately 60% of cases occur within the parotid gland, where as submandibular gland, sinonasal tract, and palate are responsible for the rest. Most patients present with an asymptomatic mass, and a minority of patients have pain and facial weakness.

Case report-

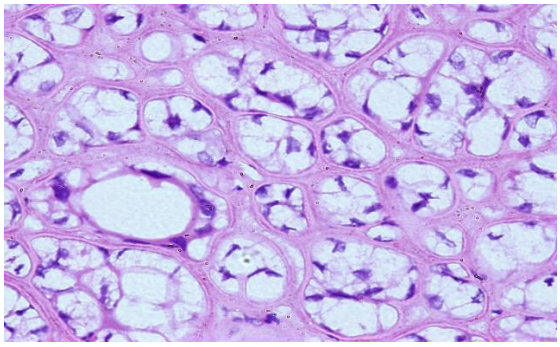
A 52 year female came with the chief complain of swelling in right side of face in front of ear since 2-3 years. Initially the swelling was small in size which increased to its current size. Past medical history, past dental history was not contributory. History of tobacco chewing since 4 years. No h/o bleeding or pus discharge. While lips are

competent, No abnormalities were detected in TMJ. Lymph nodes were not palpable.





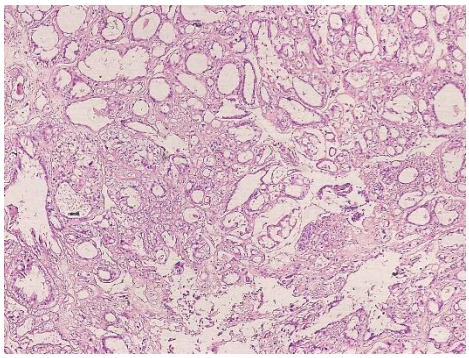
Intraoral findings were not relevant according to present scenario.



USG Features were suggestive of neoplasam.

FNAC was suggestive of malignant tumor of salivary gland.

MRI was suggestive of Right parotid malignancy



Discussion

EMC is a rare, low-grade malignant neoplasm characterized by a dual cell population of luminal ductal cells surrounded by large, polygonal clear myoepithelial cells. Recurrence is reported in 30% to 40% of cases, which may occur as late as 28 years after initial surgery. Because EMC is considered to be a low-grade malignant tumor, adequate resection with negative soft-tissue margins is the minimum recommended and necessary therapy. Neck node dissection should be considered in cases of lymph node

positivity along with chemotherapy and radiotherapy in patients with highly advanced disease, positive surgical margins, or surgically unresectable disease, although there have been almost no studies of these therapies

.

BIOLOGIC DIVERSITY:

Name: Dr Alphonsa Evelin Grace

Guided by: Dr Suchitra Gosavi

Dept of Oral and Maxillofacial pathology

CASE-1

A 28 year old female reported to the Dept of Oral and Maxillofacial pathology. She complained of growth over the right lateral border of tongue since 1 month. The face was bilaterally symmetrical. TMJ movements were within normal limits. Lymph nodes were not palpable

INTRA ORAL EXAMINATION:

On intraoral examination, a growth was evident on the right lateral border of tongue.

PROVISIONAL DIAGNOSIS

A Provisional diagnosis of FIBROMA was made and a DIFFRENTIAL DIAGNOSIS of

Neurofibroma, Leiomyoma and Benign salivary gland tumor was given.

INVESTIGATIONS & TREATMENT

- CBC, BT & CT
- Surgical excision

GROSS SPECIMEN

HISTOPATHOLOGIC EXAMINATION:

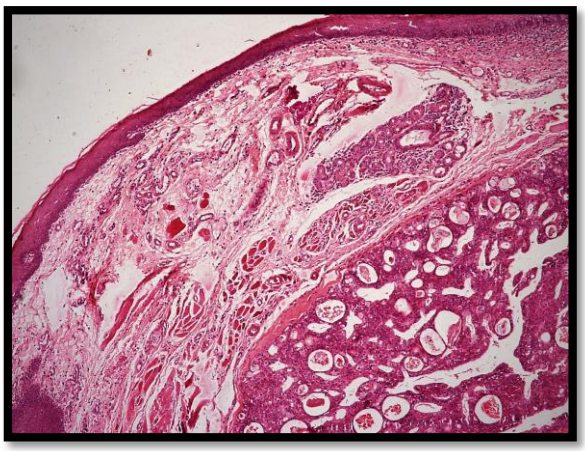


Fig.4: Histopathologic examination at scanner view shows normal appearing epithelium which appear to be stretched and atrophic with loss of rete ridges. It surrounds the normal connective tissue stroma showing the presence of salivary gland acini, blood vessels and muscle tissue separating lesional tissue which was partially capsulated.

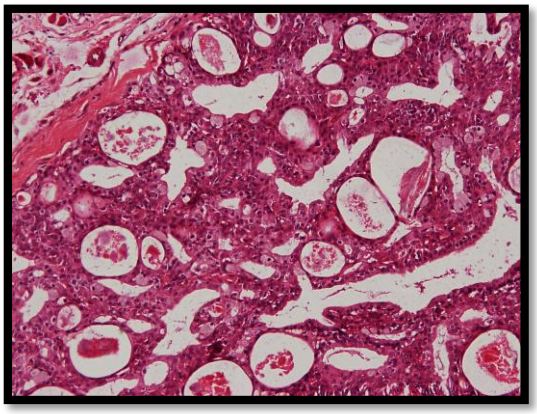


Fig.5 : At lower magnification we can see multiple cystic spaces surrounded by clusters of eosinophilic epidermoid cells with central nucleus and mucous cells which are larger than epidermoid cells.

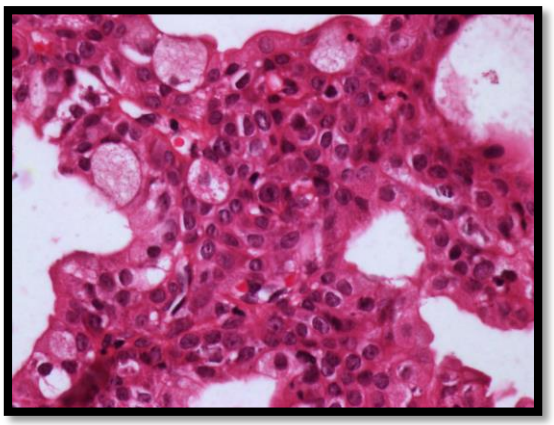


Fig.5: At higher magnification, the lesional tissue shows clusters of eosinophilic epidermoid cells showing features like vescicular nuclei, altered N:C ratio and hyperchromatism at few places. It also shows the presence of large foamy mucous cells with eccentrically placed nucleus.

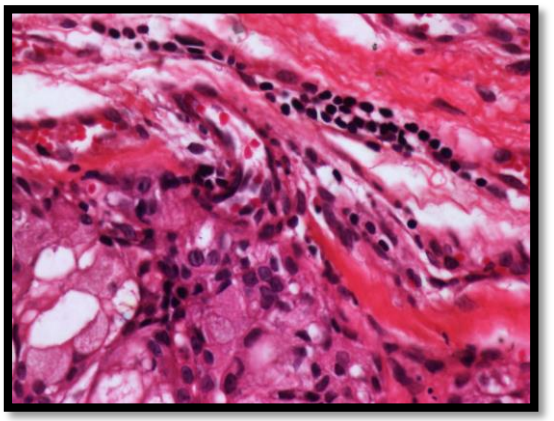


Fig.6:In this section few intermediate cells are also evident.

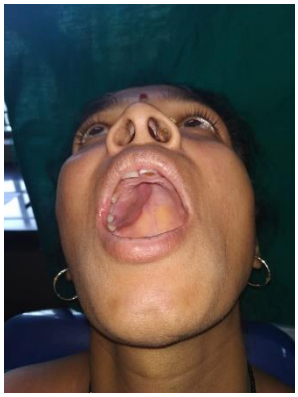
FINAL DIAGNOSIS:
MUCOEPIDERMOID CARCINOMA

- **FINAL DIAGNOSIS**
- **Muco-epidermoid Carcinoma (low grade)**

CASE-2

The usual tumour of salivary glands is a tumour in which the benign variant is less benign than the usual benign tumours and the malignant variant is less malignant than the usual malignant variants

A 38 Yrs old female reported to the Dept of Oral Pathology with a diffuse swelling over right malar region for 1 month (fig.1)



Firm Swelling over right palatalal region crossing the midline(fig.2)

Grade II mobile 15, 16, 17

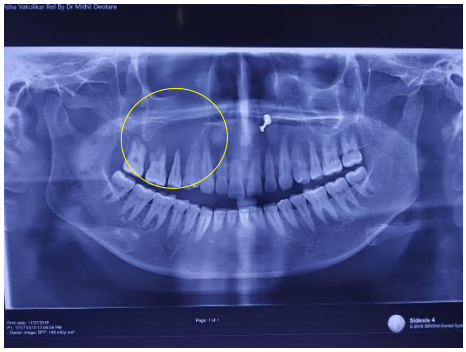
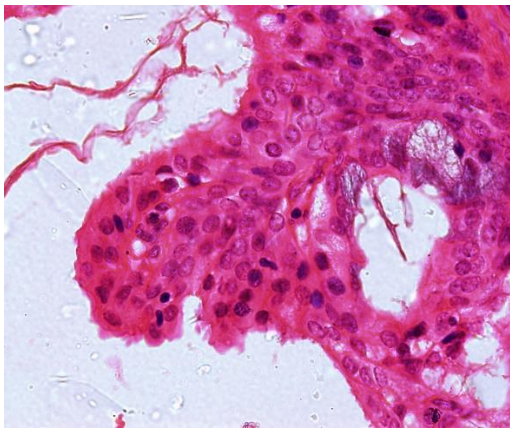
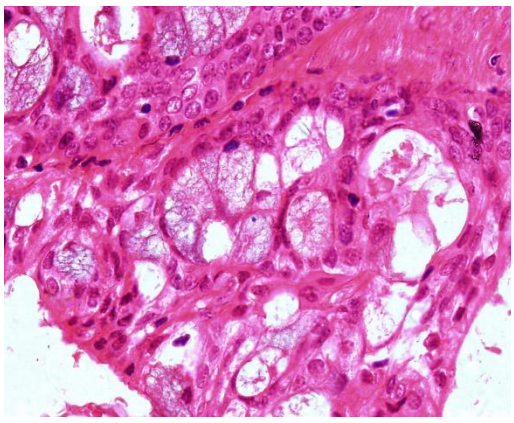


Fig.5

On radiographic examination, a difuse radiolucency was evident on the right posterior maxillary region(fig.3)

- **PROVISIONAL DIAGNOSIS: ODONTOGENIC CYST/ TUMOUR**





FINAL DIAGNOSIS: Muco-epidermoid Carcinoma (Intermediate grade)

- When compared to the previous case this lesion contained only a few cyst like spaces and mucous cells. So it was given intermediate grade

- **Case 3**

Fig.3

A 60 Yrs/Male came to our dept with a chief complaint of swelling over right side of face for 4 months. A diffuse swelling over the right cheek region crossing to the midline of the face with deviated nasal septum obliterating the nasolabialfold was noted on extraoral examination.

Lymph nodes were not palpable and TMJ movements were within normal limits

Fig.4

Fig.2: Location: Single, diffused hard intrabony swelling seen in the right maxillary posterior region with buccal cortical plate expansion obliterating the buccal vestibule extending over the palate but not crossing the midline. **Size:** Approx. 5x4 cm **Borders:** Diffuse **Colour:** pinkish **Palpation:** Hard in consistency,and non-tender .Buccal vestibule obliteration and buccal and lingual cortical plate expansion was seen.

Fig.3: Diffuse radiopacity seen in the right maxillary sinus

PROVISIONAL DIAGNOSIS:

MALIGNANCY OF MAXILLARY ANTRUM

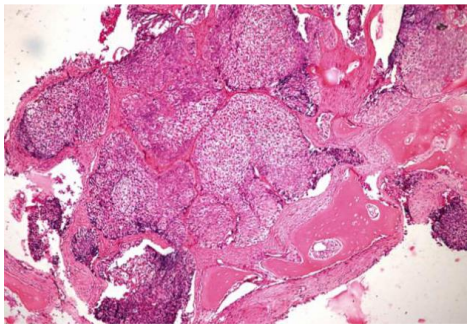
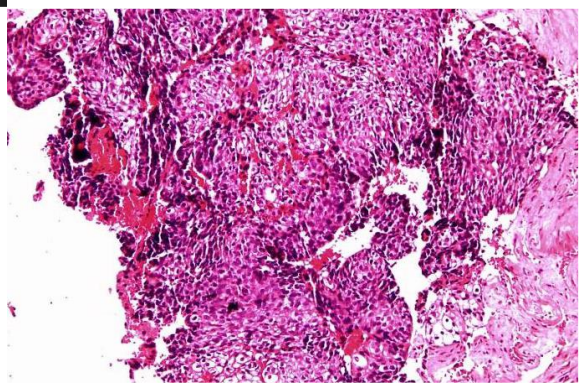


Fig.4: H & E stained section shows multiple bits of tissue. The lesional tissue shows many small and large cyst like spaces consisting of numerous Epidermoid cells, intermediate cells & mucous cells. Many small and large areas of pleomorphic clear cells are also seen with clear cytoplasm & centrally placed large hyperchromatic nuclei. These malignant glandular epithelial cells have infiltrated the nerve tissue & are seen in the form of large lobules. Intervening connective tissue stroma shows collagen fiber bundles interspersed with fibroblasts, endothelial lined blood vessels, extravasated RBCs and, mild chronic inflammatory cell response in the form of lymphocytes and plasma cells.



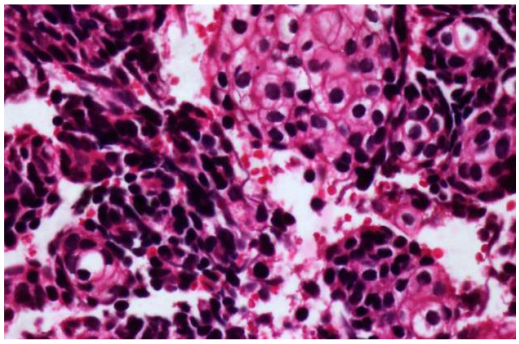
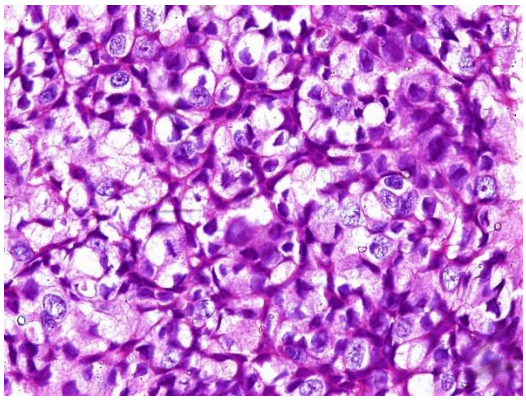


Fig.6:Epidermoid cells are highly anaplastic showing malignant features like extreme cellular & nuclear pleomorphism, altered N:C ratio, hyperchromatic nuclei, spindling of cells and numerous bizarre mitosis



FINAL DIAGNOSIS

Muco-epidermoid Carcinoma (High grade)

Discussion:

- Most common salivary gland malignancy. First studied & described by Stewart, Foote & Becker in 1945
- Most common malignant salivary gland tumor in children
- F>M; wide age range- 2nd to 7th decade
- Site – Parotid gland>Palate.
- Lips, tongue, floor of mouth, retromolar area - uncommon sites.
- The prognosis depends on the grade and stage of the tumor.
- Lips, tongue, floor of mouth, retromolar area- uncommon sites however MEC is most common salivaey gland tumor in these sites.The prognosis depends on the grade and stage of the tumor. Patients with low-grade tumors generally have a good prognosis. For most primary sites, local recurrences or regional metastases are uncommon, and around 90% to 98% of patients are cured. The prognosis for those with intermediate-grade tumors is slightly worse than that for low-grade tumors. The outlook for patients with high-grade tumors is guarded, with only 30% to 54% of patients surviving. Mucoepidermoid carcinomas of the oral minor salivary glands generally have a good prognosis,
- probably because they are mostly low- to intermediate grade tumors. Tongue and floor of mouth less predictable behaviour and more aggressive.

- **HISTOLOGICAL GRADING OF MEC**
- **LOW GRADE**
- Prominent mucin filled cystic spaces, minimal cellular atypia, relatively high proportion of mucous cells, often circumscribed, broad-front infiltration of tissues.
- **INTERMEDIATE GRADE**
- Has solid areas of epidermoid & intermediate cells. All cells types present but intermediate cells predominate. Cystic areas & mucous cells are seen but less than low grade. Cellular atypia may or may not present.

- **HIGH GRADE**
- Consist of solid nests & cords of epidermoid & intermediate cells. Cystic component & mucous cells are rare. Prominent pleomorphism & mitotic activity. Perinural invasion & necrosis may be seen.

Conclusion:

MEC is an **excellent example** of biologic diversity of salivary gland neoplasms. One MEC is **never similar to another MEC**

Different H/p picture, Different grades show different behavior and Different prognosis.

WOLF IN SHEEP'S CLOTHING:

Name: Dr Maya Nishad

Dept of Oral and maxillofacial pathology

Guided by: Dr Suchitra Gosavi

Introduction

Adenoid cysctic carcinoma (ACC) formerly known as "cylindroma", is a slow growing but aggressive neoplasm with a remarkable capacity for recurrence. It is a rare form of adenocarcinoma, a type of cancer that begins in glandular tissue.Most commonly arises in the major and minor salivary glands of the head and neck. It can also occur in the breast, uterus or other locations in the body. Symptoms depends on the tumors location. It is characterized by proliferstion of ductal and myoepithelial cellsin cribriform,tubular, solid and cystic patterns.

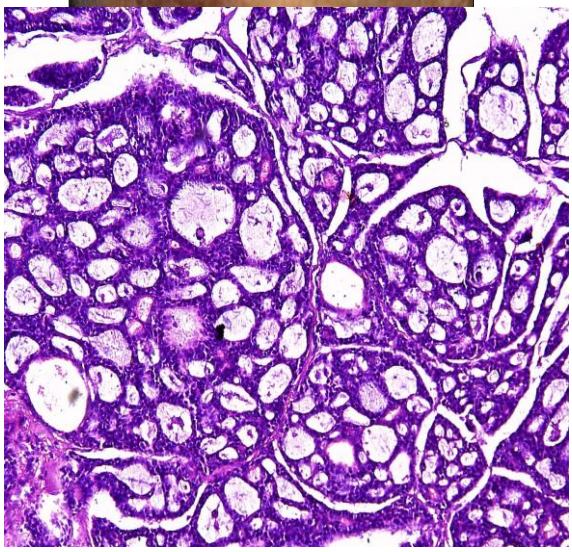
The following report describes a rare case where the patient presented with swelling present over floor of the mouth.

The salivary gland most commonly involved in ACC are the parotid, submaxillary and the accessory glands in the palate and tongue. Occurs most commonly during fifth and sixth decade of life. More commonly seen in females. Patients exhibit clinical manifestations like early local pain, facial nerve paralysis in parotid tumors, fixation to deeper structures and local invasion.

Case Report:

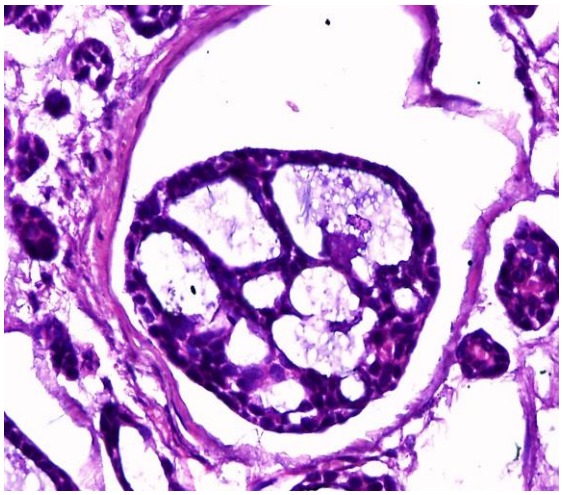
60 yrs/F , complained of pain and swelling on Rt. side of floor of mouth since 6 months Past medical history, past dental history, family history, habit history are not contributory . There was complain of diffuse swelling over submental region, 05x0.5cm,soft to firm in consistency, slightly tender on palpation was

present.There was No H/O bleeding or pus discharge. While Lips are competent. No abnormalities detected in TMJ. Single Rt SMLN, app 1.5x1.5cm, tender, mobile, firm in consistency is palpable.



Intraorally there was Diffuse swelling, measuring approximately 3x2cm, present over

Rt. side of floor of mouth, pink in color, soft to firm in consistency and tender on palpation.



Treatment of ACC is mainly surgical, although some cases successfully coupled with X ray radiation. The cure rate is varying. Molecular studies confirmed the presence of P53 mutation selectively in dedifferentiated component, suggesting pivotal role of p53 gene alteration.

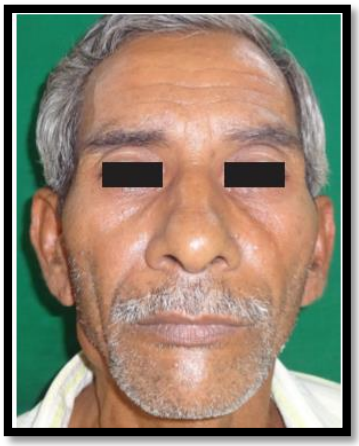
“ ENDS OF THE SPECTRUM”

Name: Dr Riya Jain

Guided by: Dr Suchitra Gosavi.

CASE-I

A 48 yrs / Male came to our department with a C/O Swelling below angle of Mandible on the right side.(fig.1)



General Examination:

- **Past Medical History , Past Dental History, Family history : Not contributory**
- **Personal Habit History : Bidi smoking since 25-30 years 3-4 times a day**

Extra-oral Examination

- **Face: Assymetric. Diffuse swelling present near angle of mandible below lobe of ear**
- **Lips : competent**
- **TMJ: NAD**
- **Lymph nodes: Not palpable.**
- **No significant intraoral findings**

- **Provisional Diagnosis: Benign tumor of parotid gland**

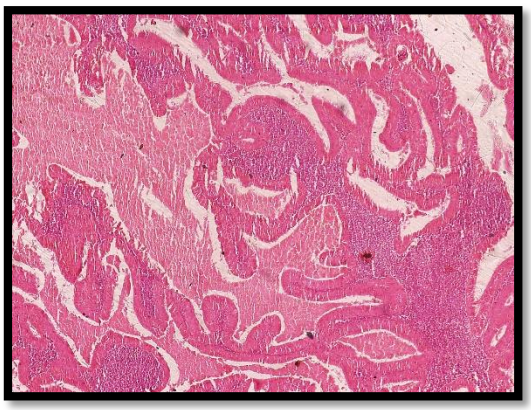
Investigations

- **Complete haemogram : within normal limits**
- **Biopsy**

Gross Specimen:

Fig.1

Incisional Biopsy:



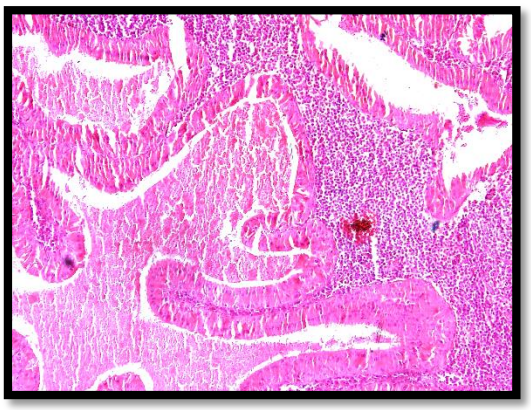


Fig: 6 Cystic cavity with bilayerd oncocytic arrangement, Lymphoid stroma

Final diagnosis: Papillary Cystadenoma Lymphomatosum (”Warthin’s Tumor”)

Salient features:

- **Second most common tumor.**
- **Exclusively in parotid.**
- **Strong association with smoking!**
- **Irregular cystic structures in which epithelium is thrown into papillary folds.**
- **Two cell layers: very characteristic!**
- **Malignant changes may occcur**

CASE-II

A 45 yrs/ Male came to our department with a complaint of swelling over the left side of palate since 3-4 months. He was alright 3-4 months back when he started noticing a swelling over the palate. The swelling increased drastically. He visited a private dentist. Medications were prescribed but no relief was seen. Patient was referred to our institute for further management.

General examination: Patient is conscious, co-operative & well oriented to time, place & person. Past medical history, dental and Family history were non ontributory.

EXTRAORAL EXAMINATION:

- **No facial asymmetry seen.**
- **TMJ: Normal**
- **Lymph nodes: Not palpable**

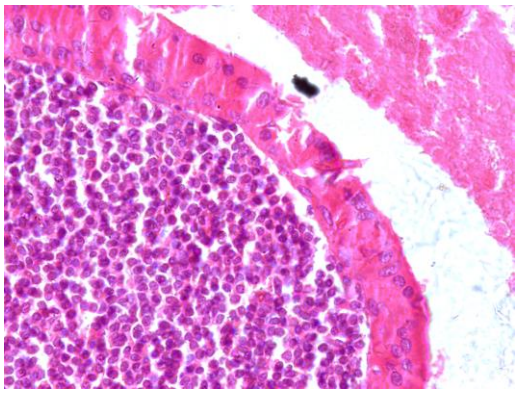
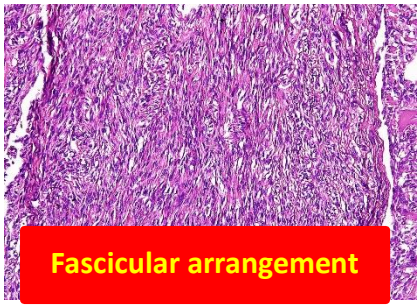
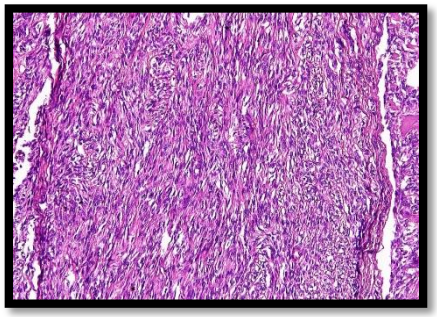


Fig: 4,5 Papillary infoldings into the cystic spac





INTRA ORAL EXAMINATION:

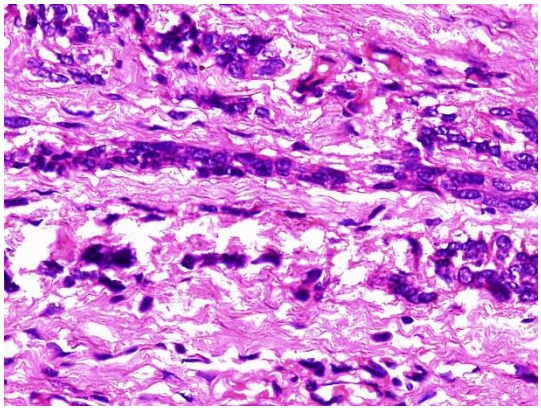
A well demarked swelling is present over palatal region in 1st, 2nd , 3rd molar region on left side, Swelling is firm, non-tender in nature, Extending medially from mid palatal raphe to junction of horizontal process of palate and alveolar process.

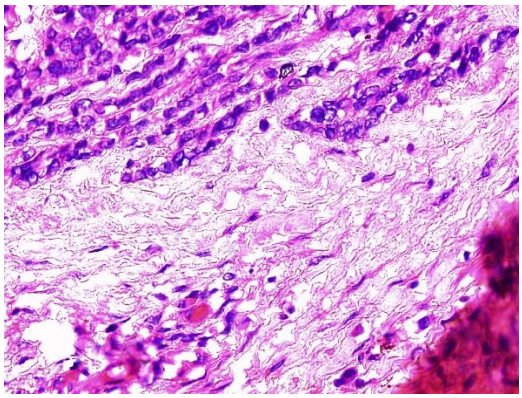
Fig.2

Provisional Diagnosis:

Salivary Gland Neoplasm?

Incisional biopsy specimen showed:





Final Diagnosis :Polymorphous Low Grade Adenocarcinoma

Salient Features:

- *Recently identified as a separate entity.*
- *2nd most common malignant salivary gland tumor after MEC.*
- *Very variable growth pattern, hence the term.*
- *Myriad histology.*
- *Diagnostic dilemma!*
- *Correctly defines the title: PARADOX!*
- According to the recent 2017 WHO classification of salivary gland tumors,

The term **Polymorphous Low Grade Adenocarcinoma (PLGA)**

is replaced by **Polymorphous Adenocarcinoma(PAC)**

- This is due to the Increased Metastasis and Poor Prognosis

DEPT OF ORAL MEDICINE AND DIAGNOSIS

Name: Dr Rashmi Kulkarni

Dept of Oral Diagnosis and Medicine

Guided by: Dr Ashita Kalaskar

INTRODUCTION:

Fibro-osseous Neoplasms rare benign fibro-osseous lesions of the jaw consists of Ossifying Fibroma and Juvenile Ossifying Fibroma. Ossifying fibroma is characterized by substitution of normal bone by fibrous tissues and newly formed calcified products such as bone, cementum or bot. Based on this it can be designated as- Ossifying fibrom, Cementi-ossifying fibroma, Cementifying fibroma. Juvenile ossifying fibroma (JOF) is an uncommon, benign, bone-forming neoplasm that is differentiated from other fibro-osseous lesions primarily by its age of onset, clinical presentation, and potential behavior.

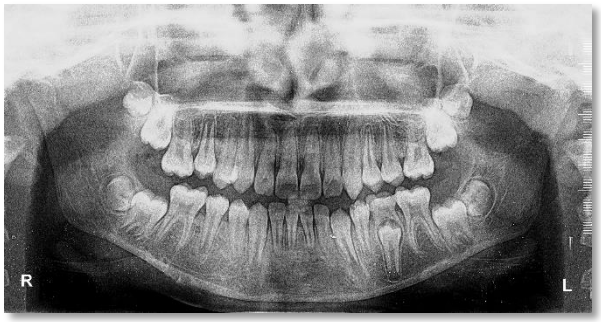
Case Report:

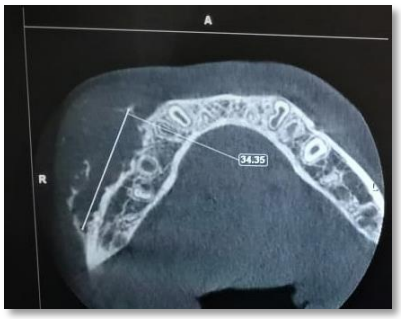
A 14-year-old male patient reported with a chief complaint of swelling in lower right back jaw region in the past 3 months. Patient was apparently asymptomatic 3 months back. When he developed a swelling on right lower face region which was insidious in onset, gradually progressive and increased over this period. The swelling was not associated with any kind of pain, ulceration or discharge. There was facial asymmetry, with swelling on right body of mandible measuring approximately 2x2 cm, anteroposteriorly extending from corner of mouth to 2-3 cm away from preauricular region and Superoinferiorly from corner of mouth and beyond lower border of mandible involving submandibular region Fig1(a). Overlying skin was normal, afebrile and without any pus discharge or ulceration. The swelling was bony hard, elevated, with well circumscribed borders, non-compressible and non- tender Fig1(b). There was no lymphadenopathy associated with it. On intraoral examination there was obliteration of buccal vestibule on right side from 44 to 47 with expansion of buccal cortical plate Fig1(c). Overlying mucosa was normal. There was no expansion of cortical plate on lingual side. The swelling was uniformly firm and nontender, without crepitus on palpation.

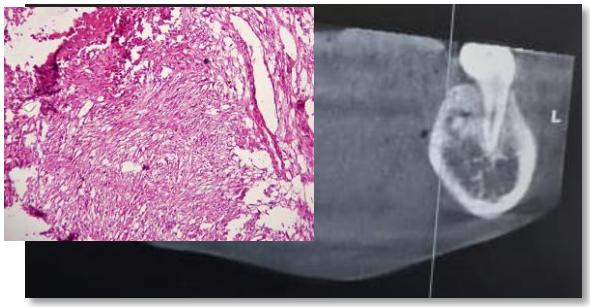
Fig1(a) Fig1(b)

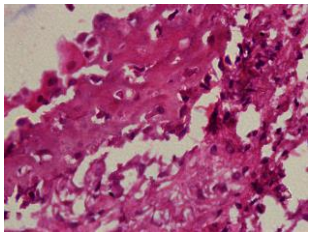
Radiographic investigations were carried out like OPG, Occlusal and CBCT. In OPG there was rarefaction and loss of cortication at lower border of mandible apical to 45 and 46 Fig2(a). In occlusal radiograph multilocular lesion with fine trabeculation was evident with 44 to 47 teeth region Fig2(b). Axial view of CBCT showed ill-defined expansile osteolytic lesion in the right posterior mandible on the buccal aspect measuring about 34 x 17 mm Fig2(c). Anteroposteriorly lesion extended from mesial of 44 to 47 region. Periphery showed partial cortication and internal

structure showed multiple fine delicate trabeculae forming locules within radiolucency giving multilocular appearance. Lamina dura with 44- 47 teeth were intact. In coronal view of CBCT lesion extended superoinferiorly from alveolar crest till the lower border of mandible measuring about 19 mm Fig2(d). Lingual cortical plate was normal. 3D reconstruction view of CBCT showed irregular thinning and bony erosion of buccal cortical plate.









most enigmatic. So, a proper clinical and radiographic evaluation and other investigations are important to establish benign nature of lesion.

DISCUSSION:

Juvenile Ossifying Fibroma benign, but potentially aggressive, fibro-osseous tumor of the craniofacial bones affecting younger individuals usually before 15 years of age and has male predilection. It is a slow growing asymptomatic tumor and patient often come with a chief complaint of facial asymmetry. Radiographically lesion may show unilocular to multilocular radiolucency with well-defined borders. Cortical thinning, perforation, tooth displacement, and root resorption, are suggestive of a feature of aggressive JOF. Sometimes opacification may be seen depending on the stage and time of radiographic examination. JOF shows high rate of recurrence of 30-58% which is attributed to the propensity of JOF to perforate cortical bone. According to Slootweg and colleagues it is classified as- Juvenile ossifying fibroma-WHO type and Juvenile ossifying fibroma with psammoma like ossicles (JOF-PO). Conservative surgical excision is the treatment of choice. Because the recurrence rate for JOF is high, continued follow-up is essential. The rapid growth rate often exhibited by these lesions which can be quite alarming and cause the clinician to suspect the presence of a malignancy. Malignant transformation has not been reported.

CONCLUSION:

Within the confusing ray of fibro-osseous lesions, the so-called juvenile ossifying Fibroma (JAOF) is perhaps the

Name: Dr Neha Gupta

Dept of Oral Diagnosis and Medicine

Guided by: Dr Ashita Kalaskar

CHERUBISM

- Cherubism is a rare self-limiting nonneoplastic disease of bone , first recognized as a separate entity in 1933 by William A. Jones in a family with several affected members.
- Familial fibrous dysplasia of the jaws, familial multilocular cystic disease of the jaws, hereditary fibrous dysplasia of the jaws.
- Cherubism is defined by the appearance of symmetrical, multilocular, expansile radiolucent lesions of the mandible and/or the maxilla that typically first appear at the age of 2 to 7 years.

Etiology : Mutation of gene of SH3BP2 from chromosome 4p16.3.

Autosomal dominant Non-familial

Grading systems for cherubism

Seward and Hankey

- **Grade I: Involvement of bilateral mandibular molar region and ascending rami, mandible body or mentis.**
- **Grade II: Involvement of bilateral maxillary tuberosities as well as the lesion of grade I, diffused whole mandible.**
- **Grade III: Massive involvement of the entire maxilla and mandible except the condyles.**
- **Grade IV: Involvement of both jaws with condyles**

Chief complaint:

- 9 yrs /Male
- C/O Swelling on B/L cheeks and multiple nodules in submandibular region since 6 y

- **Family history** Patient was apparently alright 6 years back, then his parents noticed swelling on b/l cheek and multiple nodules on submandibular region at the age of 3 years, which was gradually increasing in size.
- H/O surgical removable of nodules

Extra Oral Examination

Inspection -

- Diffuse Swelling present on Both cheeks
- Size - Approx. 3x6 cm.
- Overlying skin-Normal.
- Color – similar to surrounding skin

Palpation –

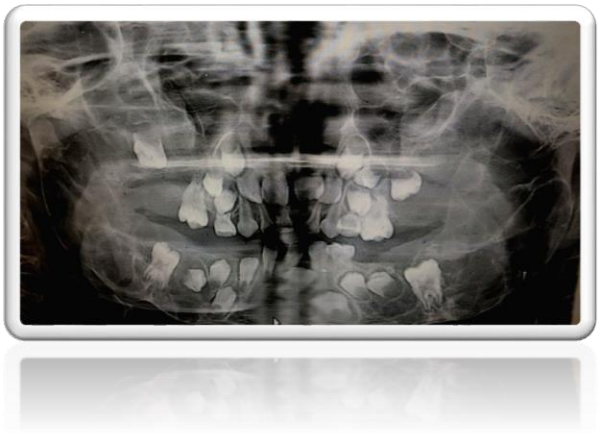
- Local temp – Not raised
- Consistency- Firm to hard
- Tenderness – Non-tender
- Lymph node – Multiple lymph node in submental and B/L submandibular region(mobile, non-tender and approx 1x1 cm)

- **Intra Oral Examination**

- Hard bony expansion present on b/l posterior limit of lower buccal aspect extending from premolar region to retromolar area.
- Same bony expansion present on maxilla, buccal as well as palatal aspect extending premolar to maxillary tuberosity region bilaterally.
- Firm and hard on palpation
- Non- tender
- **Provisional diagnosis - Fibro-osseous lesion**
- **Differential diagnosis - Cherubism**

  Fibrous dysplasia

a. RADIOGRAPHS–OPG/CBCT



- A well – defined multilocular radiolucency involving entire mandible except condyle on b/l side and anterior part of mandible.
- Absence of medial border of ramus on right side
- IANC can not be traced on b/l side
- Same type multilocular radiolucency involving entire maxilla
- Multiple impacted teeth
- Irregularity present with lower border of mandible on right side

b. BIOCHEMICAL: Blood examination(28/08/19)
Shows – Total calcium- 8.8 mg/dl which is in normal range
Phosphorus 5.5 mg/dl which is slightly increased
Alkaline phosphate – 407 U/L which is again in normal range.

- F/S/O – Grade II Cherubism
- **TREATMENT PLAN –** Underobservation and patient was recalled after 1 month
- **POST UP FOLLOW UP –** 1st recall was done on 28/9/19
  On examination – There was no increase in size of swelling
  Non -tender
  OPG report - Same as previously mentioned.

  2nd recall was done after 3 months – clinical and radiographic examination was done

And there was no increased in size of swelling.

Patient was again asked to revisit after 3 months.

DISCUSSION

Clinical features

- Early childhood
- M>F
- Mandible>Maxilla
- Painless bilateral swelling of jaw
- Enlarged submandibular lymphnodes
- Premature loss of primary teeth
- Failure of permanent teeth to erupt
- Sometimes, cherubism is associated with Noonan syndrome.

Management

- **Role of other speciality in managing cherubism**

  Oral medicine and radiology - Medicinal(conservative) treatment – intralesional steroid injections and systemic calcitonin administration

  Pediatric dentistry - Patient and parent's counseling, other pediatric care.

  Oral surgery - Surgical treatment – jaw contouring, curettage of the lesions

  Orthodontics - Patient with cherubism may be psychologically and socially disturbed; therefore, after puberty with / without surgical treatment orthodontic treatment could also be considered for cosmetic corrections.

- **Conclusion**

  Cherubism is a clinically well – characterized disease, clinico-radiographic examination is essential since the clinical presentation, location and distribution of the lesions may define diagnosis.

Name: Dr Nikhila Shroff

Dept of Oral Diagnosis and Medicine

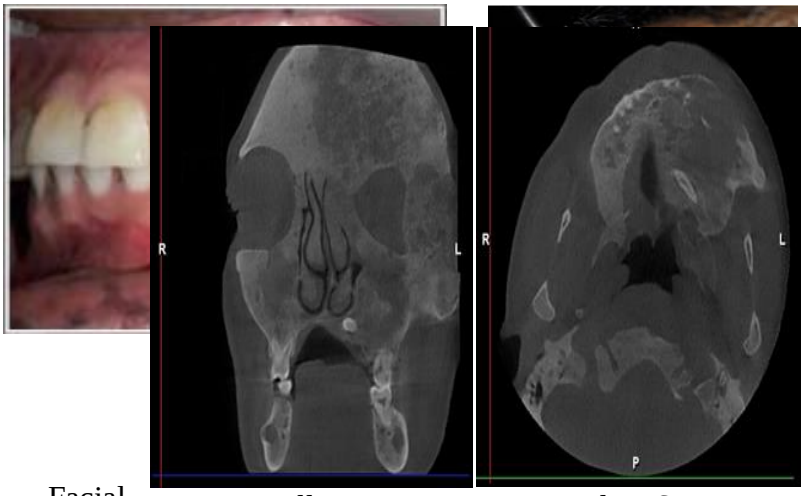
Guided by: Dr Ashita Kalaskar

CASE REPORT

A 40year old male patient with a complaint of Mobility with upper Lt. back tooth since 4 months, pus discharge from upper Lt. back tooth region since 3 days reported in the department of oral medicine and radiology.Patient was apparently well 4 months back when he experienced slight mobility with his upper Lt. back tooth. With time, mobility kept on increasing and was associated with a continuous dull aching pain. 3 days back, the patient experienced a yellowish, salty discharge from the region of the mobile tooth.

Similar episode had occurred 6 months back, which subsided on taking medication from a local practitioner. The patient denied any history of trauma/ fever/ weight loss/ paresthesia. The patient has a history of recurrent fractures of the bones since childhood. For some he was operated and for some he wasn't. He also has deformities in the legs for the past 23 years and has difficulty walking due to it.

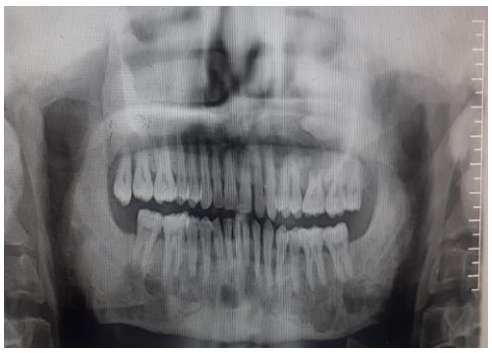
The patient has a progressive increase in the asymmetry of face since 15 years. The Lt. size of the face has been growing gradually. It was not associated with any discomfort until 6 months back when he first experienced mobility and pus discharge from his upper Lt. back tooth.Pus discharge from the upper Lt. back tooth six months back which was relieved on taking medication. Fracture Lt. leg in 1998 in an R.T.A for which he was operated.



On examination Facial asymmetry present. Diffuse swelling of the Lt. side of the face, involving the forehead, skull, malar region. Overlying skin is of the same color as the adjacent. Brownish pigmentation of the nape of the neck. No evidence of pulsation, scar mark or sinus tract. No evidence of pus discharge.The swelling is approximately 6x4cm. It extends antero posteriorly from ala of the Lt. nostril to the malar region, superoinferiorly from the skull to the corner of the mouth. The local temperature is not raised. The swelling is hard in consistency, fixed to the underlying bone. The overlying skin is free. Local temperature is not raised. Tenderness present in the maxilla few cm lateral to ala of the Lt. nostril. Intra-orally

diffuse swelling is seen on the buccal aspect of maxillary ridge extending from 22 to 27 anteroposteriorly. Frank suppuration evident from the ulceration of the attached gingiva in 24,25 region. Expansion of buccal cortical plate with perforation in 24-26 region Obliteration of the Rt. buccal vestibule. So e came to a provisional diagnosis of Fibro-osseous lesion with secondary complication (chronic suppurative osteomyelitis) and a Differential diagnosis of :Fibrous dysplasia, paget's disease, mc Cune Albright Syndrome.

Radiographs were taken like OPG,CBCT which showed Multiple, diffuse, mixed radiolucent- radiopaque lesions seen involving the entire craniofacial region (Cranial bones,maxilla and mandible) & cervical vertebrae(C1, C2, C3). Overall density of the bones is reduced. At some places, a dense homogenous appearance is appreciable(some part of the Rt. frontal bone, Rt. Zygoma & lateral wall of Lt. orbit.) Multiple cyst like radiolucencies are evident in the mandible, Lt. frontal bone Lt. zygoma & Lt.maxilla in 23-28. The cranial bones and the maxilla show considerable expansion(more on Lt. side). However, the cortication is thinned, but maintained in multiple areas. increased width of the outer and inner table of the skull vault. Candle flame appearance of the skull vault. There is considerable reduction in the sizon



Biochemical investigation PTH-**264.60**pg/ml (14-72pg/ml)

Histopathology revealed Lesional tissue is composed of irregular shaped mature and immature bony trabeculae with resting lines and osteocytes within lacunae, scattered within moderately cellular, bland connective tissue stroma. These bony trabeculae are curvilinear and resemble "Chinese script pattern"

All the features suggestive of Fibrous Dysplasia **with Hyperparathyroidism s/o Mc Cune Albright Syndrome.**

Treatment plan: Antibiotic coverage and Extraction of the mobile tooth with surgical curettage

Department of Pediatric and preventive dentistry

Name: Dr Shvani Bhadule

Dept of Pediatric dentistry

Guided by: Dr Ritesh Kalaskar

Introduction

Pediatric dentistry is a speciality which includes the amalgamation of all the other specialities. A pediatric dentist is one who believes in delivering comprehensive oral health care and aims at providing welfare to the child as a whole. History have prevailed a significant transition on how medical professionals and people in general perceived the need to save the milk tooth. It was seen that if the tooth is going to fall anyways, then what is the need to save it? Moreover, it was very difficult and tiresome for most of the dentists back then to treat children probably due to the negative attitude the children portrayed.

However, today dentistry has progressed to boundless limits. It has been realized that the very first visit should be initiated as soon as the first tooth erupts in the oral cavity. With the science of behavioural management handling a pediatric patient is no longer a herculean job. The concept of pediatric dentistry has changed a lot since its inception. Today it is one of the most versatile and sought for branch, and has become the foundation of oral health care.

A pediatric dentist has to pertain to certain objectives as stated below -

- To Relieve the Pain
- Early diagnosis and prompt treatment
- Restore the lost tooth structure
- To observe and control the necessary developing dentition of the child
- Instill a positive attitude and behavior
- Parental guidance and counseling regarding different facets
- Increase knowledge
- Management of special patients
- Health of a child as a whole

The scopes of pedodontics are boundless and a co-ordinated interdisciplinary care between various specialities and pediatric dentistry is a remarkable necessity. We have tried our level best to properly execute the interdisciplinary care between the dental specialities because, we believe that this holds a great potential to improve patient satisfaction and health outcomes.

Many cases pertaining to periodontology were done in the department, a few of which included management for aberrant frenal attachment, ankyloglossia, chronic inflammatory lesions of gingiva, gingival enlargement, pyogenic granuloma, etc. Endodontics holds a major part in most of the dental treatments. Cases like management of chronic periapical lesions in primary and permanent teeth and cases like reversible or irreversible pulpities in permanent teeth are done by various treatment modalities like apexification, apexogenesis and pulp revascularization. Prosthetic treatments for oligodontia are usually done by the fabrication of removable partial dentures and Groper's appliance for the primary dentition. A case of ectodermal dysplasia was treated by fabricating over denture for the maxillary arch and complete denture in the lower arch. To manage cleft lip and palate patients during feeding, fabrication of feeding plate is routinely done in the department.

The patients with early loss of teeth were given removable and fixed space

maintainers, cross bite corrections have been done along with management of oral habits. Also, management of submerged teeth have been done with the help of orthodontic bracket placement. Cases of rapid maxillary expansion and infant orthopaedics which includes intraoral and extra oral naso-alveolar moulding have been done. Surgical treatment included the management of mucocele, telengetic granuloma, eruption cyst, dentigerous cyst, OKC, complex odontoma, impacted and supernumerary teeth and autotransplantation.

Throughout, in the following sections we have tried to explain how significant each disciplinary has been in making our pediatric treatment successful.

Periodontal Surgery

Name: **Dr.Karthika.KK**

Dept of Pediatric dentistry

Guided by: Dr Ritesh Kalaskar

The oral health of children and adolescents mirrors their general health. In the maintenance of tooth in oral cavity, the health of the periodontium as a whole is of paramount importance. Periodontics is one of the numerous scopes of paediatric dentistry. The effects of periodontal disease observed in adults have their inception earlier in life. Gingival disease in the child may progress to jeopardize the periodontium of the adult.

Periodontal surgery is a plastic (reshaping) surgical procedure designed to restore and regenerate normal form and function to lost and damaged periodontal structures which support the teeth (the gum tissue, periodontal ligament and bone).

Case Series

Case 1: Management of aberrant frenal attachment

A 12-year-old female patient presented with a complaint of gap between the upper front teeth. On intraoral examination midline diastema and papillary frenal attachment was noted (fig1.a). The tension test was positive. Diagnosis of aberrant frenal attachment and midline diastema was noted and periodontal surgery was planned.

Treatment: Labial frenectomy is done. In which simple excision is done. (fig1 b). Suturing is done (fig1 c). Suture was removed after 7 days (fig1.d) and epithelialisation was noted. After 1-month complete healing was noted (fig1.e). 2×4 appliance was given for the correction of midline diastema. (fig1.f).

fig1 a) pre op fig1 b) frenectomy
fig1 c) suture done fig1 d) after 7 days

Fig1 e) after 1-month 2×4 appliance correction Fig1 f) Fig1 g) Diastema

Case 2: Management of ankyloglossia

An 8-year-old male patient presented with a complaint of difficulty in tongue movement and speech. On intra oral examination tongue tie was noted (fig2.a and fig2.b). The maximum extension of tongue was noted (fig2.d and fig2.e). Diagnosis of moderate case of ankyloglossia was noted and periodontal surgery was planned.

Treatment: Lingual frenectomy was done using diode laser (fig2.c). An improvement in extension of tongue was noted (fig2.f).

Fig2.a) Pre Op Fig2.B) Pre Op
Fig2.C) Immediate Post Op

Fig2.d) Pre Op Fig2.E) Pre Op Fig 2.F) Post op

Case 3: Management of chronic inflammatory lesion of gingiva

A 12-year-old female patient presented with a complaint of difficulty in chewing. On intraoral examination inflammatory lesion covering the occlusal surface of posterior teeth was noted on the 16 region (fig3.a and b). Diagnosis of chronic inflammatory lesion of gingiva or chronic gingivitis was made and periodontal surgery was planned.

Treatment: Excision of the chronic inflammatory lesion was done. Gingival health completely restored by 1 year (fig3.e).

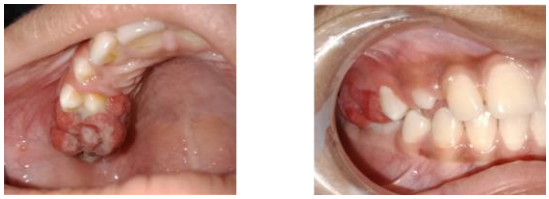


Fig3.a) Pre Op Fig3.B) Pre Op

Fig3.c)Pre Op IOPA 14 Region Fig3.D) Post Op Fig3.E) Post Op After 1 Year

Fig3.f) Post op IOPA after 1 year

Case 4: Management of Gingival Enlargement

An 8-year-old male patient presented with a complaint of abnormal gum with difficulty in chewing. On intraoral examination proliferative fibrous lesion of gingival tissue which caused esthetical and functional problem was noted (fig4.a). Diagnosis of generalised idiopathic gingival enlargement was made and periodontal surgery was planned.

Treatment: Gingivectomy was done (fig4.b) and gingival health was restored (fig4.c).

Fig4.a) Pre Op Fig4.B) Post-Surgery

Fig4.c) Post Op

Case 5: Management of pyogenic granuloma

A 12-year-old male patient presented with a complaint of swelling in the gum. On intraoral examination a swelling with minced meat like surface was found on the lingual surface of 32 region (fig5.a). Diagnosis of pyogenic granuloma was made and periodontal surgery was planned.

Treatment: Excision of the lesion is done (fig5.b).

Fig5.a) Pre Op Fig5.B) Post Surgery Fig5.C) Post Op

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1. Bernadette K. Drummond, Michael G. Brosnan ,Jonathan W. LeichterManagement of periodontal health in children: pediatric dentistry and periodontology interface
2. Dr. D. Walter Cohen -Periodontal Surgery Where Art Meets Science

Endodontic therapy in Pediatric dentistry

Name: Dr. Henpu Kamki

Dept of Pediatric dentistry

Guided by: Dr Ritesh Kalaskar

It has been observed that oral disease affects 3.9 billion people worldwide. Among which dental caries is the most prevalent oral condition, with untreated dental caries affecting 621 million children worldwide leading to reversible or irreversible pulpitis.[1] Along with dental caries, traumatic injuries affecting teeth may result in pulp exposure, which may lead to pulpal infection and apical periodontitis.[2]

Therefore, different endodontic treatment pertaining to the case has to be instituted in order to prevent tooth loss due to above mentioned conditions.

Case Series

Case 1: Management of Chronic periapical lesion in primary teeth

A 4 years old female patient reported with chief complaint of pain and decayed tooth in upper front teeth region. On intraoral examination, deep dental caries involving 51 with tenderness on percussion was seen. On radiographic examination, periapical radiolucency involving 51 was seen (Fig. 1.a). Diagnosis of chronic periapical lesion involving 51 was made and its endodontic treatment was planned.

Treatment: Access opening was done under LA, radiographic working length was determined, biomedical preparation was done along with copious normal saline irrigation. Triple antibiotic paste was placed in the canal. In the second visit remission of all the signs and symptoms was observed. Triple antibiotic paste was removed by copious irrigation with normal saline and then obturation of canal was done with Zinc oxide eugenol (Fig. 1.b), GIC restoration was given.

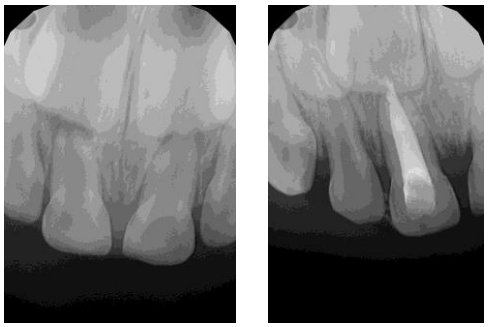

Fig. 1.a) Pre op IOPA - 51
Fig. 1.b) Post op IOPA - 51

Case 2. Management of Chronic periapical lesion in permanent teeth

A 11 years old female patient reported with chief complaint of pain in lower front teeth region. On intraoral examination, restoration with 41 was seen, tooth was tender on percussion. On radiographic examination, periapical radiolucency involving 41 was seen (Fig. 2.a). Diagnosis of chronic periapical lesion involving 41 was made and its endodontic treatment was planned.

Treatment: Access opening was done under LA, radiographic working length was determined, biomedical preparation was done with copious normal saline irrigation. Calcium Hydroxide intracanal dressing was placed. In the second visit remission of all the signs and symptoms was observed (Fig. 2.b). Calcium Hydroxide intracanal dressing was removed by copious irrigation with normal saline and then obturation of canal was done with Gutta percha, GIC restoration was given (Fig. 2.c).

Fig. 2.a) Pre op IOPA - 41 Fig. 2.b) Periapical healing Fig. 2.c) Post op IOPA 41

Case 3. Apexogenesis: MTA pulpotomy

A 7 years old female patient reported with chief complaint of spontaneous pain in lower left back teeth region. On examination, deep decayed tooth involving 36 with negative tenderness on percussion was seen. On radiographic examination, dental caries approximating the pulp and blunderbuss canal was seen with 36 (Fig. 3.a).

Treatment: Access opening was done under LA, coronal pulpotomy was done with sharp spoon excavator, bleeding was controlled by placing moist cotton pellet over amputated pulp. MTA was placed over the amputated pulp below CEJ, temporary restoration was given. In the second visit remission of all the signs and symptoms was observed. Composite restoration was given. On 12 months follow up, root formation was complete with thicker dentinal wall and closed apex (Fig. 3.b).

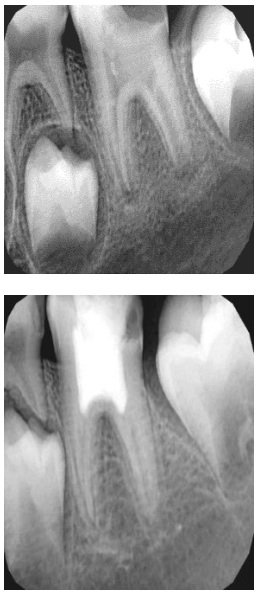

Fig. 3.a) Pre op IOPA 36 Fig. 3.b) 12 month follow up IOPA 36

Case 4. MTA Apexification

A 13 years old female patient reported with chief complaint of pain in lower left back teeth region. On intraoral examination, deep caries with 37 was seen, tooth was tender on percussion. On radiographic examination, periapical radiolucency involving 37

was seen with open apex in relation to distal root of 37 (Fig. 4.a). Diagnosis of chronic periapical lesion involving 37 was made and MTA apexification was planned.

Treatment: Access opening was done under LA, radiographic working length was determined, circumferential filing was done along with copious irrigation with normal saline. Calcium Hydroxide intracanal dressing was placed. In the second visit remission of all the signs and symptoms was observed. Calcium Hydroxide intracanal dressing was removed by copious irrigation with normal saline and Mineral trioxide aggregate (MTA) was placed in the apical third or distal canal, 2 mm short of apical opening (Fig. 4.b). A cotton pellet was placed in pulp chamber and temporary restoration was placed over it. In the third visit, Gutta percha obturation was done. In forth visit, SSC temporary crown was given (Fig. 4.c). The case is under follow up.

Fig. 4.a) Pre op IOPA 37 Fig. 4.b) MTA placement Fig. 4.c) Post op with SSC IOPA

According to the American Association of Endodontics (AAE), "pulp revascularization" is the first treatment option for immature necrotic permanent teeth. Also, the European Society of Endodontology (ESE) state that "pulp revitalization" is an alternative to apexification, since it empower additional root development. Thus, it reduces the incidence of root fracture over time.

Case 5

An 8 years old male patient reported with the chief complaint of pain and broken tooth in upper front teeth region with history of trauma 3 months back. On intraoral examination, fracture tooth with 21 was seen, tooth was tender on percussion. On radiographic examination, fractured crown involving pulp with blunderbuss canal was seen in respect to 21 (Fig. 5.b). Diagnosis of Elli's class IV fracture involving 21was made and pulp revascularization treatment was planned.

Treatment: Access opening was done under LA, radiographic working length was determined, copious irrigation with 20 ml 1.5 % sodium hypochlorite was done followed by irrigation with 10 ml of normal saline. Triple antibiotics paste intracanal dressing was placed. In the second visit remission of all the signs and symptoms was observed. Triple antibiotic paste dressing was removed by copious irrigation with sodium hypochlorite and normal saline was done. Bleeding was induced with a sterile K file; it was inserted beyond apex and colt was allowed to form in the canal, MTA was placed over the clot at a level below CEJ. After placing a moist cotton pellet over MTA, temporary restoration was given. In third visit, GIC restoration was given. On 6 months follow up, root formation was complete with thicker dentinal wall and closed apex (Fig. 5.b).

Pulpal revascularization

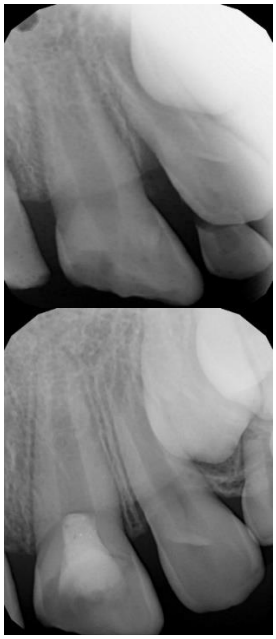

Fig. 5.a) Pre op IOPA - 21 Fig. 5.c) 6 month follow up IOPA 21

Note: Regardless of the treatment performed, the endodontic success of these immature teeth should be assessed based on the remission of clinical signs and symptoms and resolution of periapical radiolucency.

Since, functional tooth retention is an outcome important to be considered, specifically in young patients.

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Prosthetic Rehabilitation in Children

Name: Dr. Hemraj Badhe

Dept of Pediatric dentistry

Guided by: Dr Ritesh Kalaskar

INTRODUCTION :-

Dental caries is one of the most important causes of loss of teeth.

Apart from dental caries, there are various reasons for loss of loss of teeth e.g. congenital abnormalities like cleft lip and palate and ectodermal dysplasia, true anodontia or hypodontia, and loss of teeth due to trauma.

Treatment of such patient becomes mandatory because children are often affected psychologically by the unacceptable appearance due to loss of teeth.

So, prosthetic rehabilitation is necessary in such type of patients.

However, prosthetic management in children is more challenging because of the anatomy, erupting teeth, growth patterns and co-operation of patient.

Also, pediatric patients often require follow-up for relining or replacing the prosthesis until the definitive treatment is done.

Here are few cases of prosthetic management of children in our department.

Case 1- Case of Oligodontia

Oligodontia is a rare developmental dental anomaly in humans characterized by the absence of six or more teeth.

The prevalence of isolated oligodontia is unknown.The estimated prevalence of both syndromic and non-syndromic oligodontia varies from 1/625 to 1/1,250 depending on the studies.Possible causes of oligodontia include viral disease during pregnancy, genetic predisposition, metabolic imbalances, developmental abnormalities and environmental factors. Mode of inheritance may be autosomal dominant or autosomal recessive or X-linked recessive. Various genes associated with oligodontia are PAX9, MSX1, LTBP3,WNT10A,EDA, EDARADD, AXIN2, and IKBKG.

A 7 years male patient reported to the department of pediatric and preventive dentistry with a chief complaint of missing teeth in upper and lower arches and wanted to replace them.

On clinical examination, there were several missing teeth in upper and lower arches. (Fig 1.1)

On radiological evaluation in OPG 51, 52, 53, 54, 61, 62, 63, 64 in upper arch and 71, 72, 73, 81, 82, 83, 84 were missing. No tooth buds were seen with respect to 12, 13, 14, 22, 23, 24 in upper arch and 31, 32, 33, 35, 41, 42, 44, 45. But tooth buds with 11 and 21 were seen. (Fig 1.2)

So considering the age, dental condition and compliance of the patient removable partial denture was advised in upper and lower arches as it can be modified as and when needed.

Removable partial dentures were fabricated (Fig 1.4) and delivered to patient (Fig 1.5 and Fig 1.6) and instructions were given to patient and parents. Patient is recalled periodically to modify dentures until the definitive dental treatment is given.

Fig 1.1 - Clinical photographs

Fig 1.2 - Orthopantamogram

Fig 1.3- Impression Fig. 1.4- Fabricated Dentures

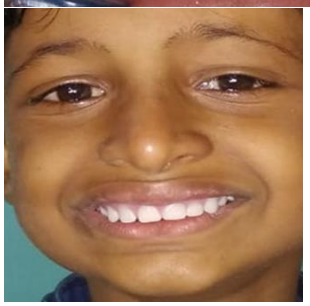


Fig 1.5 - Post insertion (Intraoral)
Fig 1.6- Post insertion (Extra oral)

Case 2- Case of Oligodontia

A 13 year old male patient reported to the department with chief complaint of missing teeth in lower anterior region.

On clinical examination, in mandibular arch, 31, 32, 33 and 41, 42, 43 were missing. (Fig 2.1)

Orthopantamogram (OPG) was advised to rule out any abnormalities or impaction of teeth.On radiographic examination OPG revealed absence of 31, 32, 33 and 41, 42, 43. No pathology was seen with this region. (Fig. 2.2)

Two treatment options were given to the patient 1) Removable partial denture and 2) Fixed prosthesis i.e. Groper's appliance. Patient opted for fixed prosthesis.

So impressions of upper and lower arches were made in alginate with band adaption on 36 and 46. Groper's appliance is fabricated in lab and then cemented on 36 and 46 with glass ionomer cement.

Fig 2.1 - Clinical photograph
Fig 2.2 – Orthopantamogram (OPG)

Fig 2.3 – Groper's appliance on cast
Fig 2.4 - Groper's appliance in mouth

Fig 2.5 - Preoperative photograph
Fig 2.6 - Postoperative photograph

Case 3- Case of Oligodotia (Deciduous Dentition)

a 4 year old girl was presented by her parents to the department with a chief complaint of missing teeth in upper anterior and posterior region and wanted to replace them.

Parents gave a history of trauma to the teeth 1 year back in which upper anterior teeth were lost and extraction of two posterior teeth due to caries.

On clinical examination, there were multiple missing teeth in upper arch. 51, 52, 61, 62 (due to trauma) and 54, 64 (due to extraction). 74, 84 were restored with stainless steel crowns. (Fig 3.1)

Considering the age and compliance of patient , we decided to give a fixed prosthesis which will replace the anterior teeth as well as acts as a space maintainer till the eruption of upper permanent incisors.

Band adaptation was done with 55 and 65. Impressions were made in alginate. Cast was poured in stone. After that we fabricated Groper's appliance by soldering 19 guage stainless steel wire to bands and adding teeth with acrylic resin in anterior region.

After finishing and polishing, the appliance was cemented on 55 and 65 with glass ionomer cement. (Fig 3.2)

This appliance gave good esthetic results. Also it will help in phonetics and speech development.

Fig 3.1 - Preoperative photographs

Fig 3.2 - Preoperative photographs

Case 4- Case of Ectodermal Dysplasia

A 6 year old boy reported with a chief complaint of missing teeth, unesthetic appearance and difficulty in chewing.

On clinical examination, only two conical teeth were present in the incisor region in upper arch.(Fig4.1)

It was a clinically diagnosed case of ectodermal dysplasia. (Fig4.3)

OPG was advised for detailed diagnosis. OPG revealed absence of teeth except two conical teeth and tooth buds with 11 and 21 in upper incisor region. (Fig4.2)

After discussing with parents, we finalized to give over denture in upper arch and complete denture in lower arch.

Pulpectomy of the conical teeth were completed. A metal coping was fabricated and cemented over them.

After this, primary impressions were made in alginate for upper arch and in low fusing impression compound for lower arch. (Fig4.4) Final impressions were made in ZOE paste after border moulding. (Fig4.5) Then all the clinical and laboratory procedure were carried out to fabricate dentures.

After finishing and polishing dentures were inserted, instructions were given and patient was recalled periodically for modification or replacement of dentures. (Fig 4.7)

The dentures will build confidence in child by giving an esthetic appearance as well as mastication will improve.

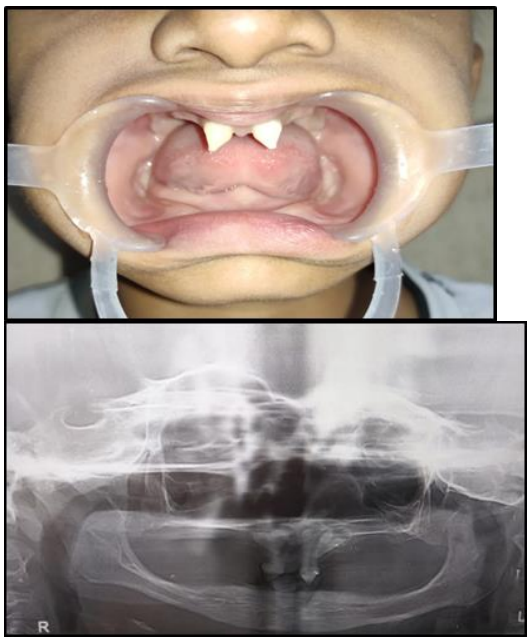


Fig 4.1 – Intraoral photographs
Fig 4.2 – Orthopantamogram (OPG)

Fig 4.3 – Extra oral photographs

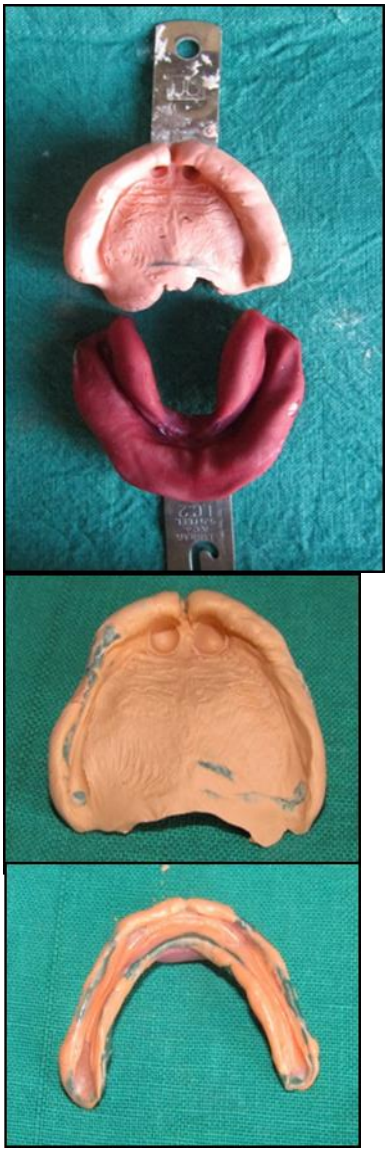


Fig 4.4 –Primary Impressions
Fig 4.5 –Final impressions

Fig 4.6 – Preoperative Photograph
Fig 4.7 – Postoperative Photograph

Case 5- Management of Cleft Lip and Palate

Cleft lip and palate is a congenital disorder that needs early intervention. These cases are treated as an emergency in the department of pediatric and preventive dentistry. Cleft palate causes impairment of the most basic function of suckling. As a result of cleft in the palate, there is nasal regurgitation of milk, which may get aspirated into lungs, causing pneumonia and ultimately leading to death. So feeding plate is a crucial emergency care, which if not provided timely could lead to life-threatening complication.

A 6 days old male baby was referred from government medical college and hospital, Nagpur for prosthetic management of cleft palate.

To fabricate feeding plate, impression of upper arch was made in low fusing impression material. Cast was made in dental stone and feeding plate was fabricated.

After finishing and polishing the plate, it was inserted in patient's mouth. Patient's parents were instructed and recalled periodically until the surgery for repair of cleft palate was done for any modification or replacement of feeding plate.

Fig 5.1 – Preoperative Photograph
Fig 5.2 – Preoperative Photograph

PREVENTIVE, INTERCEPTIVE ORTHODONTICS AND INFANT ORTHOPEDICS

Name: Dr. Shruti Balasubramanian

Dept of Pediatric dentistry

Guided by: Dr Ritesh Kalaskar

PREVENTIVE ORTHODONTICS

Prevention is not only better than cure but more stable and cheaper as well.

- Graber (1966) has defined preventive orthodontics as the action taken to preserve the integrity of what appears to be a normal occlusion at a specific time.
- Profit and Ackermann (1980) has defined it as prevention of potential interference with occlusal development.

PREVENTIVE ORTHODONTIC PROCEDURES

- ✓ Parent Education
- ✓ Caries Control
- ✓ Care of deciduous teeth
- ✓ Management of ankylosed tooth
- ✓ Maintenance of quadrant wise tooth shedding time table
- ✓ Checkup for oral habits and habit breaking appliance if necessary
- ✓ Occlusal equilibrium if there are any occlusal prematurities
- ✓ Management of abnormal frenal attachments
- ✓ Extraction of supernumerary teeth
- ✓ Space maintenance
- ✓ Management of deeply locked first permanent molar

SPACE MAINTAINERS

Removable space maintainer

A 6 year old male child reported with loss of upper right and left back tooth region. On examination, it was observed that upper right and left deciduous first molars.

Treatment: We planned to give a removable space maintainer to the patient since the patient and parents were cooperative for treatment.

The patient is currently on follow up.

PREOP

POST OP

Band and Loop space maintainer

5 year old male patient reported with pain on upper left back tooth region. On examining the patient, it was observed that he had a grossly carious upper left first deciduous molar which when observed hopeless prognosis with furcation involvement.

PRE OP

Cementation of Band and Loop Space Maintainer

Treatment: Extraction of 64 followed by band and loop space maintainer was planned.

Band and loop space maintainer is unilateral, non functional, passive, fixed appliance indicated for space maintenance in posterior segment.

After two year follow up eruption of first premolar was seen both clinically and radiographically. After that space maintainer was removed.

ERUPTION OF 24

Distal shoe appliance

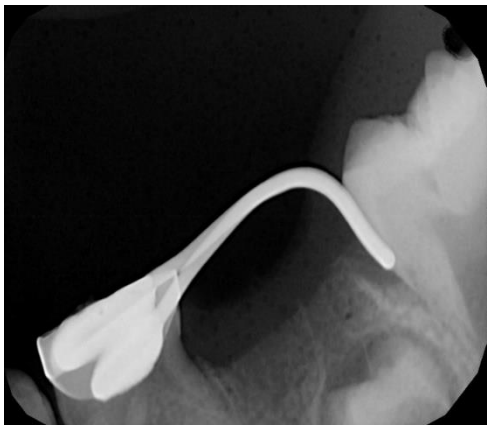
It is an intra-alveolar appliance which is indicated when 2nd primary molar is extracted or lost before eruption of 1st permanent molar.

A 5 year old female reported with pain in lower left back tooth region. On examination, grossly carious lower left second deciduous molar was observed and lower first permanent molar had not erupted. IOPA with 75 showed furcation

involvement with periradicular radiolucency.

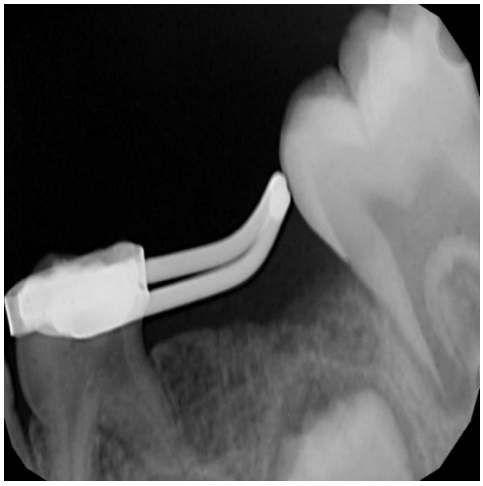
Treatment: Distal shoe appliance was cemented followed by extraction of 75 after confirming the radiographic position.

PRE OP IOPA



CEMENTATION OF DISTAL SHOE APPLIANCE

After follow up of 1 year, eruption of first permanent molar was observed radiographically. After eruption of 36, distal shoe was replaced with reverse band and loop space maintainer.



Reverse band and loop space maintainer

INTERCEPTIVE ORTHODONTICS

- **The American Association of Orthodontists (1969)** defined interceptive orthodontics as that phase of science and art of orthodontics employed to recognize and eliminate the potential irregularities and malpositions in the developing dentofacial complex.

- **Profitt and Ackermann (1980)** defined as the elimination of the existing interferences with the key factors involved in the development of the dentition.

INTERCEPTIVE ORTHODONTIC PROCEDURES

- ✓ Serial extraction
- ✓ Diastema closure
- ✓ Space regaining
- ✓ Expansion
- ✓ Control of abnormal oral habits
- ✓ Cross bite
- ✓ Myotherapeutic exercises

Treatment: A blue grass appliance was planned as a habit reminder to intercept the thumb sucking habit.

- ✓ 5Interception of developing skeletal malrelations

MANAGEMENT OF ORAL HABITS

Deleterious oral habits are one of the most prevalent causes of malocclusion and has a vicious relationship.

Thumb Sucking

A 8 year old male patient reported with spacing between upper and lower front teeth. On examination, anterior open bite leading to tongue thrusting was observed. The callus of his fingers showed characteristics of thumb sucking.

BLUE GRASS APPLIANCE

After 6 months, the patient showed correction of anterior open bite with mere interception of habit.

TONGUE THRUSTING

A 11 year old male patient reported with spacing between upper and lower front teeth. On examination the patient presented with anterior open bite and tongue thrusting habit.

Treatment: It was planned to give a habit breaking appliance which is commonly given for tongue thrusting i.e. palatal crib.

PRE OP

CEMENTATION OF PALATAL CRIB APPLIANCE

The patient was followed up for 6 months and showed correction of anterior open bite.

PRE OP FOLLOW UP AFTER 6 MONTHS

MOUTH BREATHING

A 12 year old girl reported with malaligned teeth. On examination, she showed incompetent lips, and physical features characteristic of mouth breathing. The patient was subjected to mouth breathing tests i.e. butterfly test, mirror test and water holding test. Based on the history given by parents and clinical tests, she was diagnosed as a mouth breather.

Treatment: To intercept the habit, the patient was given oral screen/vestibular screen with holes were given to the patient. These holes were closed sequentially to let the patient adapt to nasal breathing.

PRE OP

VESTIBULAR / ORAL SCREEN

The patient was followed up for 6 months and showed significant correction in habit. She achieved competent lip seal and significant dentoalveolar correction and appropriate facial balance.The parent also reported an overall improvement in quality of life and improvement in quality of sleep as well as academic performance.

PRE OP **POST OP**

MANAGEMENT OF CROSSBITE

GRABER has defined cross bites as a condition where one or more teeth may be abnormally malposed buccally or lingually or labially with reference to opposing tooth or teeth.

Management of crossbite is an emergency treatment in pediatric dentistry, it has to be treated when it is first seen. There are numerous methods available for correction of crossbite:

- Catlans appliance
- Removable Z spring appliance
- Fixed mechanotherapy
- Inter-arch elastics

Case 1: Crossbite correction with Catlans appliance

11 year old girl reported with malpositioned upper front teeth. On examination, crossbite was observed in relation to 11.

Treatment: Decision was made to give a catlans appliance made of self cure acrylic. It is a lower anterior bite plane with a 45° inclined plane.

PRE **OP**

CATLANS APPLIANCE

POST OP

Case 2: Crossbite correction with Removable Z spring appliance

A 8 year old boy reported with backwardly placed upper front tooth. On examination, single tooth crossbite was observed in relation to 11. No other skeletal discrepancy was present and Angles Class I molar relation was present.

Z-SPRING APPLIANCE

Treatment: Removable plate with Z-spring appliance was given to the patient since he was extremely cooperative. The removable plate comprised of short labial bow, z-spring and u clasp for retention of plate. Z-spring was activated and the correction was observed after 2 weeks

POST OP

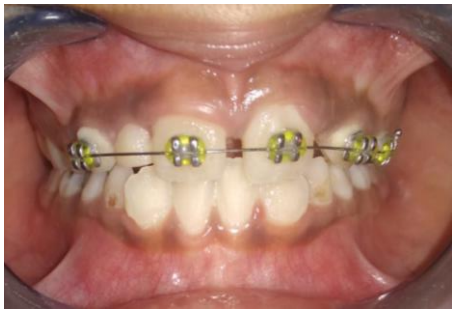
P

Case 3: Crossbite due to overretained primary tooth

A 7 year old girl reported with malaligned teeth. On examination it was observed that there was an overretained deciduous left central incisor and permanent central incisor was in crossbite.

OVERRETAINED DECIDUOUS TOOTH SINGLE TOOTH CROSSBITE

Treatment: Firstly extraction of deciduous tooth was done. Following this using 0'12 wire correction was done following bite raise. Correction was obtained in 2 weeks.



POST OP

Case 4: Management of scissor bite

A 12 year old female reported for general checkup. On examination, it was observed that 14, 44 was in buccal non-occlusion. This condition is a variant of crossbite i.e. Scissor bite.

Treatment: It was decided to treat it with use of interarch elastics. The final correction showed proper and stable occlusion.

PRE OP

INTERARCH ELASTICS

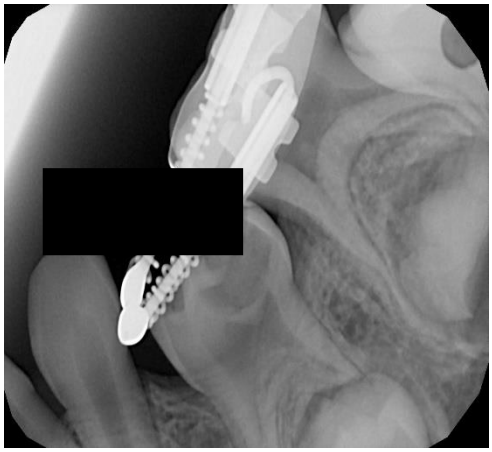
POST OP

Management of submerged 74

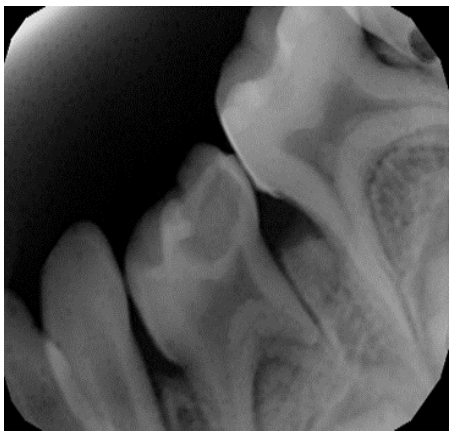
A 5 year old boy reported food lodgement in lower left back tooth region. On clinical examination, it was observed that there was a submerged 74. No abnormal percussion sounds were observed. On taking IOPA, it was seen that there was lack of space for eruption of 74.

PRE OP

Treatment: Firstly, after completing space analysis it was observed that a total of 2 mm space was required for allowing eruption of 74. Using space regaining appliance, about 1.5 mm space was obtained and then it was observed that proximal surface of 75 was hindering the further eruption of 74. Hence, proximal disking of 75 was done. After 5 months, eruption of 74 was observed.



CEMENTATION OF SPACE REGAINER



POST OP

RAPID MAXILLARY EXPANSION

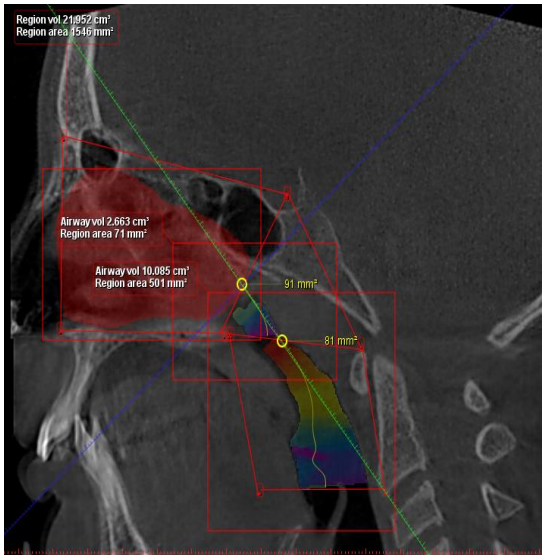
A 12 year old girl complained of irregular teeth and difficulty in sleeping at night. On examination, incompetent lips, constricted nasal passage, long face and v-shaped upper arch was observed. On taking proper history and performing diagnostic tests, it was concluded that she was a mouth breather.

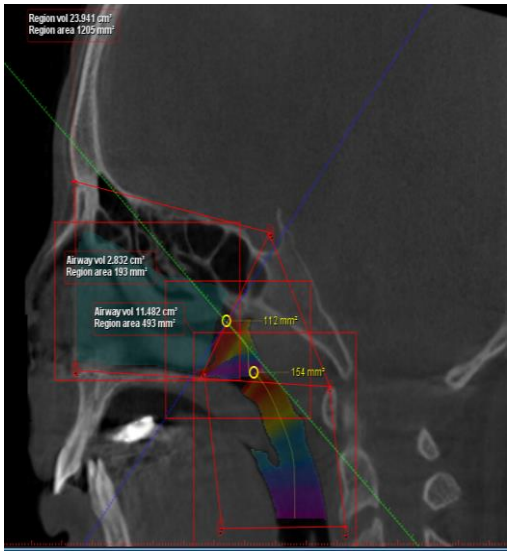
A CBCT was taken for the patient to perform airway analysis and it was seen that she had a constricted airway.

Treatment: It was decided to perform Rapid Maxillary Expansion (RME). It was decided to give a bonded RME appliance wherein parents were trained to perform daily activation twice a day. The active period for appliance was 3 months followed by 3 months retention wherein the appliance was kept passively.

AIRWAY	PRE RME AIRWAY VOLUME (cm^3)
cavity volume	21.952
pharyngeal volume	2.663
haryngeal volume	10.085

PRE OP APPLIANCE INSERTION





PRE RME AIRWAY ANALYSIS POST RME AIRWAY ANALYSIS

INFANT ORTHOPEDICS

Techniques used to mold the maxillary, alveolar and nasal tissues of an infant with unilateral or bilateral CLP.

Other terms:

- Neonatal infant orthopedics
- Presurgical infant orthopedics
- Nasoalveolar molding (NAM)

INTRAORAL NASOALVEOLAR MOULDING

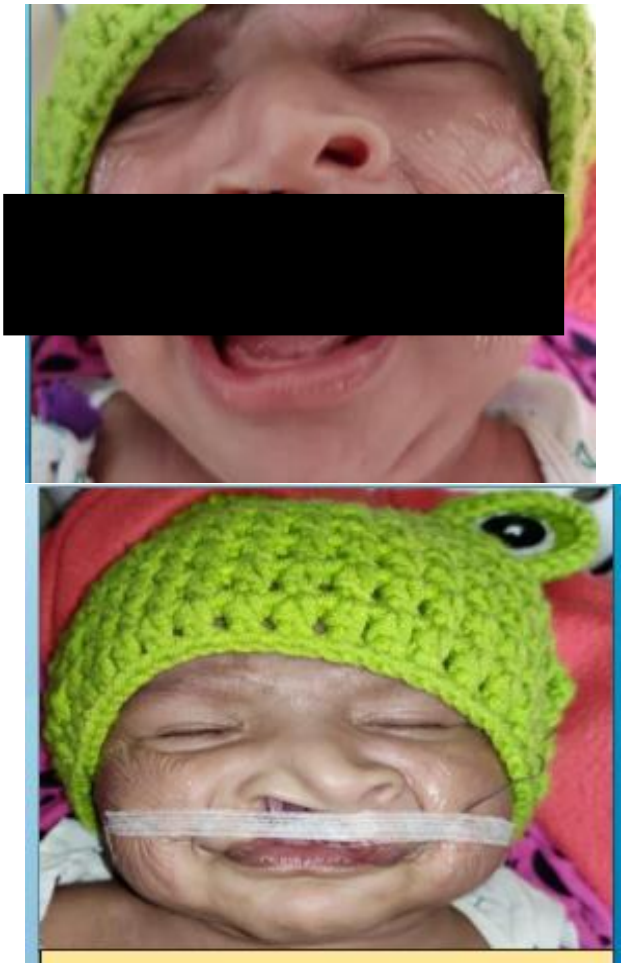
4 days old infant reported with Veau's Class III CLP (Right side)

PRE OP

First visit – Impression of cleft recorded using impression compound and cast poured. Following this, NAM plate with nasal stent was fabricated using self cure acrylic resin.

Second visit- The NAM plate was stabilized in place, with the help of wire extending bilaterally from anterior portion of plate and was attach to the headcap of the infant for stabilization of the plate. The bulb of the nasal stent was placed inside the cleft nostril, lifting the dome of the alar cartilage.After stabilizing the palatal plate and nasal stent, tegaderm was applied on skin and the lips were approximated with 3M steri strip adhesive tape. Parents were instructed to use the same plate for feeding also.

Activation of appliance: Patient was recalled after 2 weeks for follow up and activation of plate was done by adding 1 mm of soft acrylic resin on lateral aspects of the larger segment and over acrylic bulb of nasal stent to mold alveolar and nasal cartilage respectively.



STABILIZATION OF NAM PLATE 3M STERI STRIP ADHESIVE TAPE

First visit - Impression of cleft recorded using impression compound and cast poured. Following this, NAM plate with nasal stent was fabricated using self cure acrylic resin.

Second visit–Feeding plate was delivered and NAM therapy was initiated.

Extraoral NAM appliance has two components-

- Wire component - made by 24 gauge soft stainless- steel orthodontic wire with nasal stent.
- Adhesive tape-3M Steri strip adhesive skin closure 19 mm x 5mm.

Appliance adjustment: Infants were recalled after every 30 days for activation of appliance. The activation of appliance was done by adding 1mm soft acrylic resin over the upper lobe of the nasal stent to gently lift the alar dome cartilage.

EXTRAORAL NASOALVEOLAR MOULDING

6 days old infant reported with Veau's Class III CLP (Left side)

Oral Minor Surgical Procedures in Pediatric Dentistry

PRE NAM

POST NAM

Dr. Rajesh Laxmanrao Ijalkar

Dept of Pediatric dentistry

Guided by: Dr Ritesh Kalaskar

Introduction-

Surgery performed on pediatric patients involves several special considerations unique to this population. It is importantto perform a clinical and radiographic preoperative evaluation of the dentition as well as extra-oral and intraoral radiographs: It includes intraoral film and extra-oral imaging if the area of interest extends beyond the dento-alveolar complex. Behavioral guidance of children in the operative and preoperative periods presents a special challenge. Special attention should be given to the assessment of the social, emotionaland psychological status of the pediatric patient before surgery. Children have many unvoiced fears concerning the surgical experience, and their psychological management requires that the dentist be cognizant the surgery is important and should be done in the presence of parents.

The potential for adverse effects on growth from injuries and surgery in the oral and maxillofacial region markedly increases the risks and complications in pediatric

patients.Surgery involving the maxilla and mandible of the young patient is complicated by the presence of developing tooth follicles. Alteration or deviation from standard treatment modalities may be necessary to avoid injuries the follicles. To minimize the negative effects of surgery on the developing dentition, careful planning using radiographs, tomography, cone beam computed tomography surgery, and 3 D imaging techniques are necessary to provide valuable information to assess the presence, absence, location, and quality of individual crown and root development.

Case-1 Management ofMucocele

Mucocele is defined as a mucus-filled cyst that may appear in the oral cavity, appendix, gall bladder, paranasal sinuses, or lacrimal sac.[1-3] The term mucocele was derived from a Latin word, mucus, or mucus, and coele or cavity.[1,3]Mucocele is the seventeenth most common salivary gland lesion in the oral cavity.[3] It results from accumulation of mucus due to alteration inthe minor salivary glands.Mucoceles are usually asymptomatic but sometimes can cause discomfortby interfering with speech, chewing, or swallowing. Treatment options include surgical excision, marsupialization, micro-marsupialization, cryosurgery, laser vaporization, and laser excision.[3]

A 12-year female patient reported tothe Department of Pediatric and Preventive Dentistry with chief complaint of the painless swelling on inner aspect of lower lip since 15-20 days. The swelling was small initially then increases gradually in present size. On intra oral examination we found round, solitatary, fluctuant swelling on inner aspect of lip which measuring approximately 6-8mm in size (Fig.1.1). The lesion was diagnosed as mucocele based on its clinical feature and history of trauma.

Treatment-It was excised by using a diode laser (Fig.1.2).Immediate photograph has shown (Fig.1.3) and on6-month follow-up, there was without recurrence ofthe lesion(Fig.1.4).

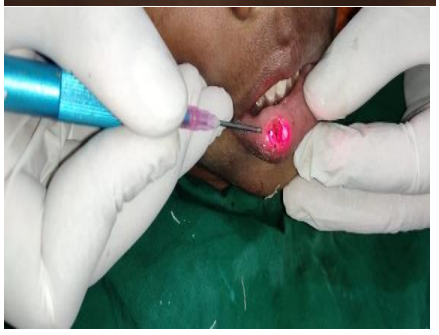
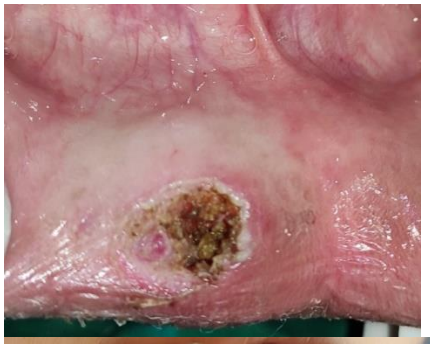


Fig.1.1-Pre-operative photograph
Fig.1.2- Intra-operative photograph



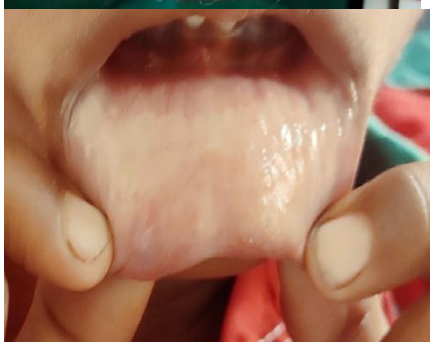


Fig.1.3- Immediate photograph
Fig.1.4- 1 Month follow up photograph

Case-2Management ofTelangiectaticGranuloma

Management oftelangiectaticgranuloma in a pediatric dental patient is difficult task for pediatric dentists. A 10-year old female patient reported to the Department of Pediatric and Preventive Dentistry with the

chief complaint of localized overgrowth of soft tissue on the left size of the buccal mucosa. On intra-oral examination the soft tissue overgrowth seen measured approximately 1 cm x 1 cm (Fig.2.1). It was solitary whitish, exophytic, pedunculated with a warty surface, irregular borders. On palpation the swelling was tender and firm in consistency.Treatment-Excisional biopsy was performed by using diode laser and excised tissue send for the histopathological examination. From histopathological report it was confirmed thattelangiectaticgranuloma. On 1 month of follow up period,there was complete healed lesion.

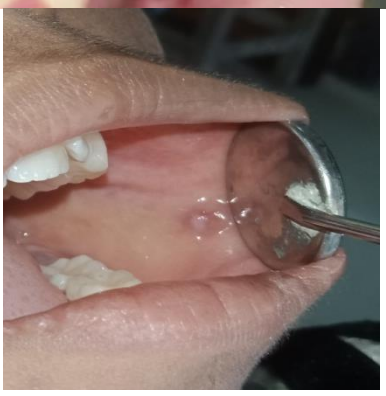


Fig.2.1-Pre-operative photograph
Fig.2.3- 1 Month follow up photograph

Case-3 Management of Eruption Cyst

The eruption cyst is a form of soft tissue benign cyst accompanying with an erupting primary or permanent teeth and appears shortly before the appearance of these teeth in the oral cavity.[5,6] An 8 year old male patient reported to the Department of Pediatric and Preventive Dentistry with the chief complaint of swelling on an upper anterior tooth, blueish discoloration, and missing tooth seen in the same region (Fig.3.1). On radiographic examination, we found the erupting and immature left central incisor and soft tissue hindering the path of eruption of maxillary left central incisor (Fig.3.2).

Treatment- So, we performed surgical excision of the eruption cyst by using scalpel and create a path for the eruption of maxillary left central incisor (Fig.3.3maxillary left central incisor is almost fully erupted (Fig.3.4).

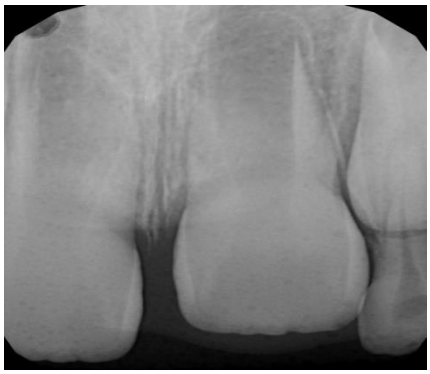


Fig.3.1-Pre-operative photograph
Fig.3.2-Pre-operative IOPA 21

Fig.3.3- Immediate photograph
Fig.3.4- 3 Months follow up photograph

Case-4 Management of Dentigerous Cyst

Dentigerous cyst is a type of odontogenic cysts and has a rate between 20% and 24% in all the jaw cysts.[8]These cysts form between the enamel epithelium and the enamel of the crown of the affected tooth, and the fluid accumulation occurs in the related area.[7-9]Dentigerous cyst always includes the crown of an un-erupted or impacted tooth, and it is commonly observed in the mandibular third molar region.[7-10]This cyst often shows no symptoms, and they are generally detected by a radiographic examination to find the reason for the delayed eruption. Different options were advised for the treatment of these cysts such as the elimination of the damage on the affected permanent tooth, enucleation of all pathological tissues with the removal of the involved tooth, or marsupialization.[6]

A 9 years old male patient reported to the Department of Pediatric and Preventive Dentistry with the chief complaint of swelling in the lower right back region of jaw since 4 days. On extraoral examination, facial asymmetry and swelling were seen on the right side of the mandibular jaw (Fig.4.1). On intraoral examination, painless swelling was measuring 2cm x 2 cm in dimension from primary canine to second primary molar also missing primary first molar(Fig.4.2). Grade III mobility and grade-I mobility were seen with primary canine and primary second molar respectively. On panoramic radiographic examination, uni-locular radiolucency was seen with primary canine to primary second molar (Fig.4.3). On intraoral radiographic examination, root resorption was seen with primary canine and primary second molar (Fig.4.4). On cytology examination macroscopically- A clear pale yellow colored fluid was seen and microscopically – Pus cells with few RBCs and cholesterol crystals are seen (Fig.4.5). The provisional diagnosis was a benign odontogenic cyst/tumor.

Treatment- Firstly, the extraction of primary canine and second primary molar done then marsupialization was performed. Then irrigation was performed by using betadine solution to the cystic cavity and patient discharge with prescribing analgesic and antibiotic medication. The patient recalled alternate days for dressing change. On 1 month follow up the resumed eruption of 2nd premolar (Fig.4.7).

Fig.4.1-Pre-operative photograph
Fig.4.2-Intra-oral photograph

Fig.4.3- Orthopentogram

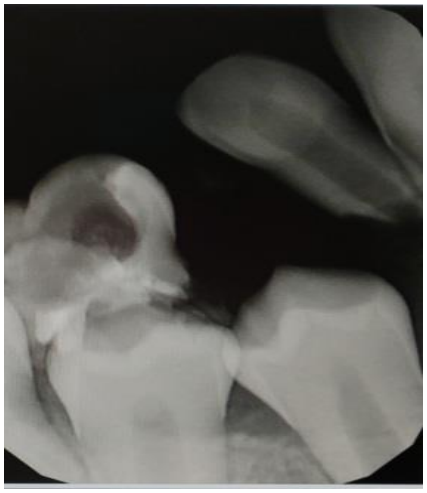


Fig.4.4-IOPA 83-85

Fig.4.5-Aspirational fluid

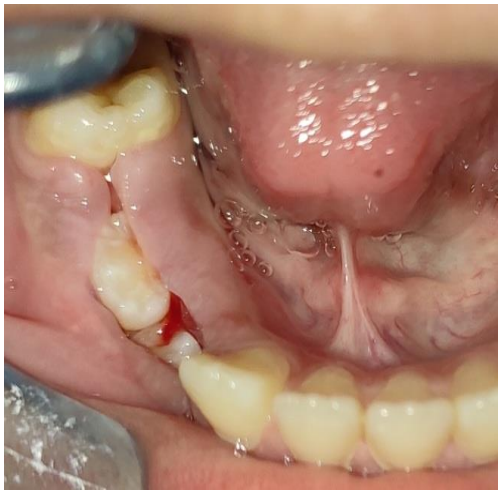


Fig.4.6-7 Days follows up photograph
Fig.4.7-30 Day follows up photograph

Case -5 Management of Odontogenic Keratocyst

The term odontogenic keratocyst (OKC) was first used by Philisen in 1956 and the histological criteria and features of OKC were first described by Pindborg and Hansen in 1963. The OKC occurs with a peak incidence in the second to third decade of life and is rare in children under 10 years old. The recurrence rate of OKC has been reported as 2.5% to 62.5%. Recurrence has been attributed to incomplete removal or the presence of epithelial remnants or satellite cysts in the osseous margin.[11]

An 8yr old female patient reported to the Department of Pediatric and Preventive Dentistry with the complaint of swelling in the lower right back region of the jaw. On Intraoral examination slight buccal

swelling was seen around the right primary first and second molar (Fig.5.1). On panoramic radiographic examination revealed that permeant teeth displaced and round radiolucency with well-defined sclerotic margins (Fig.5.2). The lesion displaced mandibular premolar and canine. On the cytological examination cholesterol crystal was seen in the aspirational fluid (Fig.5.3).

Treatment- We firstly extracted the mandibular primary first and second molar then the marsupialization was performed (Fig-5.3 & 5.4). Irrigation was performed by using betadine solution to cystic cavity patient discharge with prescribe analgesic and antibiotic medication and recall for the alternate day for dressing change for 2 months. On 2 months follow-up, 1st premolar tooth resumed eruption (Fig-5.5). On 6 months follow up the patient was asymptomatic with erupting premolar (Fig-5.6). On radiographic examination 6 months follow up period without recurrence of the cystic lesion (Fig-5.7).

Fig.5.1-Intra-oral photograph

Case-6 Enucleation of Complex Odontoma Followed By Intentional Reimplantation of Impacted Lateral Incisor

Odontoma is defined as odontogenic benign tumors containing all the various component tissues of the teeth which are usually detected during the first two decades of life. Two main types of odontoma are described: complex odontoma, an amorphous and disorderly pattern of calcified dental tissues, and compound odontoma, multiple miniature or rudimentary teeth.[12] Although unknown, the etiology of odontoma can often include local trauma or infection. In all cases of complex odontoma, surgical enucleation represents the best therapeutic option and the prognosis after treatment is very favorable, with very low recurrence's incidence.[12]

A 13-year-old female patient was reported to the Department of Pediatric and Preventive Dentistry with chief complaints of missing upper anterior teeth. On intraoral clinical examination missing maxillary left lateral incisor was seen (Fig-6.1). Panoramic radiographic examination we noted the radiopaque mass in the region with left lateral incisor and horizontally impacted maxillary left lateral incisor (Fig-6.2).
Treatment- Firstly we reflect flap and using round bur for bone cutting was performed. Enucleation procedure was performed for the excision of complex odontoma(Fig-6.3 & 6.4). We removed the impacted left lateral incisor atraumatically. Left lateral incisor tooth was replanted into the socket and then suture was placed (Fig-6.5 & 6.6). Splinting was done for stabilizing the tooth. The patient recalled after a 1-week suture was removed and then an intentional root canal therapy procedure was performed. After 3 months we performed post and core procedure and a tooth was restored with a metal-ceramic crown (Fig-6.7 & 6.8).

On 12 months follow up on a panoramic radiography examination was done (Fig-6.9).

Fig.6.1-Pre-operative photograph

Fig.6.2- Pre operative Orthopentogram

Fig.6.3-After exposure of odontoma
Fig.6.4- After enucleation of odontoma

Fig.6.5- Exposed impacted lateral incisor

Fig.6.6- Post op(Reimplantation of impacted lateral incisor)

Fig.6.7- Follow up after 3 months
Fig.6.8-Metal ceramic crown with 21

Fig.6.9-
Post op OPG after 12 month

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Pharmacologic behaviour Management

Dr.Suyash Joshi

Dept of Pediatric dentistry

Guided by: Dr Ritesh Kalaskar

Pharmacological behavior management for anxious, uncooperative and mentally challenged patients is done under conscious sedation and general anesthesia in our department.

Conscious sedation

In Conscious sedation the level of sedation must be such that the patient remains conscious, retains the protective reflexes, be able to understand and respond to verbal commands. This is comparatively safe method as compared to general anesthesia as verbal communication is maintained throughout the period of sedation. It reduces the dental fear and anxiety. Generally, conscious sedation is done with nitrous oxide by inhalation route. Inhalation route has rapid onset and short recovery period.

Selection criteria

- Patient should be cooperative with mild to moderate anxiety to enable them for accepting the sedation procedure.
- Patient should not have common cold, tonsillitis or nasal blockage.

Case Report

A 7 year old patient reported to our department with pain in left lower left back teeth region while having food. Patient was cooperative but had moderate anxiety. On examination, deep carious tooth in relation to 74 75 was seen which were tender on percussion. On radiographic examination dentinal caries approximating pulp was seen (Fig a). Diagnosis of chronic irreversible pulpitis was made and treatment under conscious sedation was planned.

Treatment: Informed consent from the patient's parent was taken. Under an Anesthetic care the treatment was performed. Pulpectomy of 74 85 was done followed by SSC placement in relation 74 75 to maintain the mesiodistal dimension of 74 75 (Fig b).

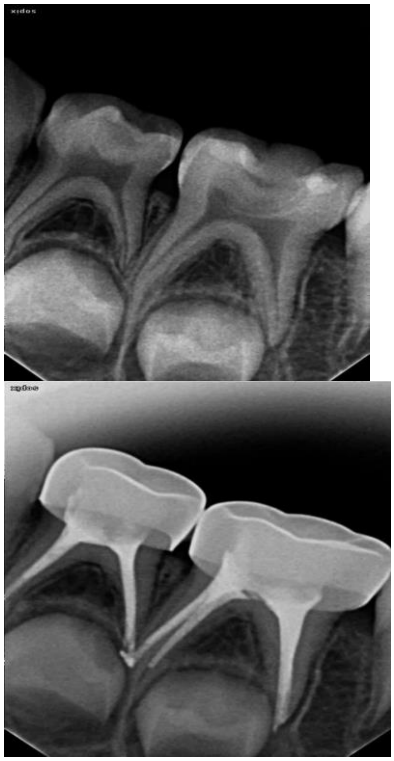

Fig. Pre-operative Fig. Post-operative

General anesthesia

General Anesthesia is a controlled states of unconsciousness in which protective reflexes is lost. General Anesthesia enables us to perform treatment of multiple teeth in one appointment without child having any negative dental experience, since child does not have any memory of the treatment procedure.

Case report

A 5 years old patient reported our department with decayed anterior and posterior teeth and pain in upper and lower back teeth region. On examination, grossly carious tooth in relation to 54 52 51 61 62 64 and deep caries in relation to 74 84 was seen. Diagnosis of severe childhood caries

was made and treatment under general anesthesia was planned.

Treatment: Informed consent from the patient's parent was taken. Under an Anesthetic care the treatment was performed. Pulpectomy of 52 62 64 74 84 was done followed by SSC placement in relation to 64 74 and extraction of 54 was done followed by band and loop space maintainer placement in relation to it. Composite restoration was given in relation to 52 51 61 62 and GIC restoration was given in relation to 84.

Fig. a) Pre op front view Fig. a) Pre op maxillary arch Fig. a) Pre op mandibular arch

Fig. a) Post op front view Fig. a) Post op maxillary arch Fig. a) Post op mandibular arch

CONCLUSION:

Endowing treatment to the children is quite a daunting task but at the same time one is rewarded with immense amount of satisfaction after treatment completion. We have been trying our level best to properly treat any case that is being reported in our department. In this article, we have attempted to highlight the cases that are being reported in our department, which encompass the holistic approach in pediatric dentistry.

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