

# LINK



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# Future of restorative dentistry

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**“Yesterday's treatments were about need, Tomorrow's will be about desire to live fast and stay young.”**

Due to busy routines of everyday life, patients want their procedures to be done in more speedy and sophisticated way than it was earlier. Recent technologies along with internet facilities have made everything quite easy for day to day life, making it quite simpler in advance way. People nowadays prefer spending more money in doing things rather than wasting their precious time.

As it is said by Sir Benjamin Franklin **“Time is money.”**

With need of something more convenient, accurate and time saving, in 1971 Dr Francois Duret has given idea of CAD CAM technology in dental field. Earlier it was being used in many industries such as Automotive, Fashion designing, Jewellery designing, Aerospace, Medical device, Defense, Consumer products etc

Most general questions asked by everyone is

**WHAT IS CAD CAM? AND WHY WE NEED IT?**

CAD CAM is an acronym for computer aided design / computer aided manufacturing or (milling)..

Traditional methods for production of indirect restorations usually include impression making, die or model making and final manufacture Inaccuracies can occur at any stage and if introduced early on, may have

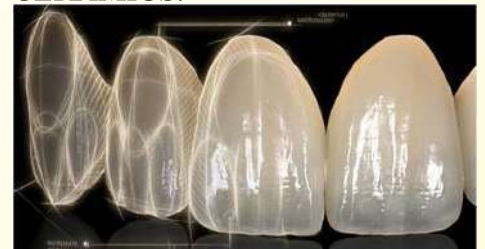
an exaggerated effect on the final restoration. Cost can be high, in terms of clinical and laboratory time and expertise. The cost of producing remake restorations must be borne either by the dentist or the laboratory. Exrtra chair side time and visits are unwelcome to the patient, who may find them inconvenient and stressful.



One visit treatment for indirect restorations has been made possible by technological development which enables digitalization and replication of the complex topography of the tooth surface using computer aided design/ computer aided manufacturing (CAD CAM).



Another reason for introducing CAD CAM in dental industry is CERAMICS.



Routine use of ceramic in restorative dentistry is a recent phenomenon. Dental ceramics are the most natural

appearing replacement material for missing tooth substance available in a range of shades and translucencies to achieve life like results. however , the mechanical properties and physical properties and the manufacturing techniques of so called conventional dental ceramic have revealed certain short comings i.e. excessive brittleness , crack propagation , low tensile strength , fracture of the restoration , wear of antagonists and sintering shrinkage and neither was pore free.



For overcoming these drawbacks restoration were needed to be produced by machining blocks of pore free industrial quality ceramics



- GENERAL RULES FOR USING CAD CAM ,
- Ø A digitalization tool/scanner that transforms geometry into digital data that can be processed by the computer
  - Ø Software that processes data and, depending on the application, produces a data set for the product to be fabricated.
  - Ø A production technology that transforms the data set into the desired product.

n 3D-SURFACE DIGITIZING OR SCANNING METHODS (with Description of

**System which we have in Department of Prosthodontics Crown and Bridges in Government Dental College and Hospital , Nagpur)**

The scanning device converts the shape of the prepared teeth into three dimensional (3-D) units of information (voxels). The computer translates this information into a 3-D map (point cloud). The operator designs a restoration shape using the computer which generates a tool path, which is used by the milling device to create the shape from a restorative material.

**Direct (at the tooth/in office method)**

n This system can scan the tooth preparation intraorally and by selecting appropriate materials, the dentist can fabricate the restorations and seat it within a single appointment.

The intraoral scanner present in our college is **CS 3500 (CARESTREAM )** which has , high-angulations scanning of up to 45 degrees and to a depth from -2 to +13mm. and completes both arches scanning within 3 minutes according to manufacturers.



a) INTRAORAL SCANNER (CS 3500 CARESTREAM b,c ) STEREO LITHOGRAPHIC FILE (for easy transfer of image in any cad cam system)

**INDIRECT METHODS ( EXTRA ORAL SCANNERS/LAB SCANNERS)**

Here scanning of conventional impressions, cast, study models, and articulated models can be done precisely and model present in our college is **Ceramill Map 400 SCANNING OF DENTAL CAST**

WITH MAP 400 EXTRAORAL SCANNER This has DNA speed scanning which reduces scan time by 50%.



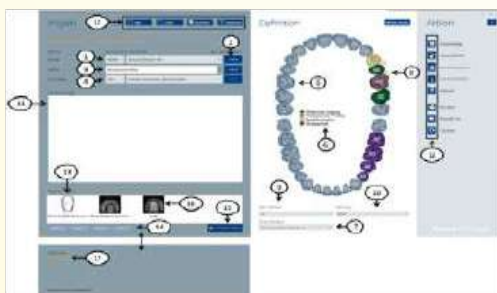
SCANNING OF DENTAL CAST WITH MAP 400 EXTRAORAL SCANNER

### CAD ( DESIGN)

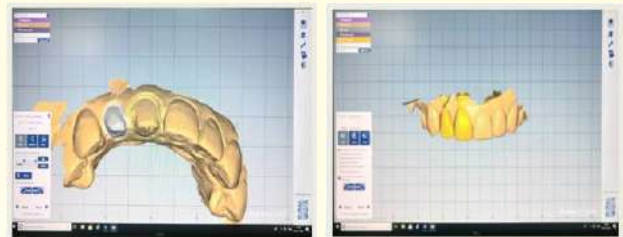
The **Ceramill Mind** CAD design software and all available extensions is available in our college. Indication for using it , Anatomically reduce crown and bridges. Inlays, onlays , veneers , complete denture prosthesis,full mouth rehabilitation cases, cast partial prosthesis and implant prosthesis etc.

### CERAMILL WIZARD (soft ware for designing)

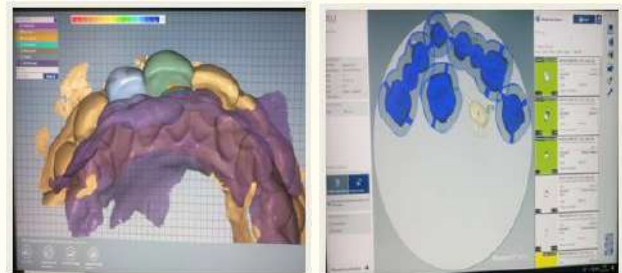
It gives anatomic user guidance through design process and guides accurately and efficiently through entire design process and also show tools available to optimize the Design outcome. It can also copy or mirror teeth to produce uniform tooth shape / structure in jaw telescopic crown and attachments.



Designing system starts with selection of teeth in progress along with required data



a) Establishing crown margins in impression and auto correcting it b) Designing of prosthesis



a) Checking occlusion with antagonist teeth along with material thickness for required prosthesis b) nesting (positioning) of prosthesis in zirconia block

### 5 AXIS WET AND DRY MACHINING ( CERAMILL MOTION 2.)

Maximum number of materials and indications is associated with it. It has intelligent machine concept with high performance, super high frequency spindle for maximum speed with highest precision. Intelligent design guarantees optimum protection of all electronic components in wet operation.



Ceramill motion 2

Early positioning and aligning of framework in blank. Easy changing of position, size and alignment of connector .Speedy calculation of milling path.



Final milled block

### SUMMARY

Today as in era of Nicholas Dubois De Chemant, most advances are derived from collaborations with the ceramics engineering community. Notable recent progress includes; the advent of predictable ceramic materials and techniques for esthetic complete crowns, partial coverage and laminate veneer restorations; improved metal ceramic esthetics with the advent of opalescent porcelains and framework modification. Introduction of CAD/CAM and machining as a route to fabrication of restorations, improved understanding of the clinical response of all-ceramic prosthesis and of the material factors that influence clinical longevity.

**Once a new technology rolls over you, if you are not part of the steamroller, you become part of the road".**  
-Stewart Brand

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## Pre- ortho periodontic procedures : review of cases

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### Introduction :

Orthodontic-periodontic interactions are mutually beneficial. The combined approach can greatly enhance the periodontal health and dentofacial aesthetics in many situations. The main aim of periodontal therapy is to restore and maintain the health and integrity of the attachment apparatus of teeth.<sup>[1]</sup> Orthodontic treatment aims at providing acceptable functional occlusion and aesthetic occlusion with appropriate tooth movements. These movements are strongly related to the interactions of teeth with their supportive periodontal tissues.<sup>[2]</sup> Orthodontic treatment can be justified as a part of periodontal therapy if it is used to reduce plaque accumulation, correct abnormal gingival and osseous forms, improve aesthetics, and facilitate prosthetic replacement.<sup>[3]</sup>

Some periodontal cases require orthodontic treatment as an adjunct while in other cases orthodontic treatment require periodontal intervention as an adjunct.

Orthodontic proclination of the incisors have a greater risk of recession and loss of attachment, especially in areas with minimal gingiva and bone support. To maintain adequate width of the attached gingiva in these conditions, mucogingival surgery may be advised during the course of orthodontic treatment.

High frenal attachment is considered

to be one of the causes for midline diastema. The abnormal frenum prevents mesial migration of the central incisor and the aberrant fiber increases the relapse tendency after orthodontic space closure. Surgical removal of the frenum is usually advised in these situations and it should be performed after the completion of orthodontic treatment unless the frenum prevents space closure or become painful or traumatized.

Forced eruption of an impacted tooth is a common orthodontic treatment procedure. Proper exposure of the impacted tooth and preservation of the keratinized tissue are important to avoid loss of attachment after orthodontic treatment. Apically or laterally positioned pedicle graft is usually advised in this situation<sup>[4]</sup>

Circumferential supracrestal fiberotomy is usually advised to reduce the relapse tendency which occurs after the orthodontic tooth movement. . Fiberotomy is usually performed toward the end of the active orthodontic therapy, i.e., a few weeks before the removal of the orthodontic appliance.<sup>[5]</sup>

Crown lengthening is usually performed in teeth with shorter clinical crown to facilitate proper placement of orthodontic appliance. Crown lengthening is usually performed by gingivectomy or an apically repositioned flap in combination with gingivectomy

prior to orthodontic bonding procedures.<sup>[6]</sup>

Preorthodontic osseous surgery is mainly indicated for crater, hemiseptal defect, three-wall defect, and furcation lesion. This enhances the patient's ability to maintain these interproximal areas during orthodontic treatment.

Alveolar ridge augmentation and placement of implants for orthodontic retention are other adjunctive procedures performed to achieve orthodontic treatment goals

The gingival margin level of the six maxillary anterior teeth plays an important role in the aesthetic appearance of the crowns.<sup>[3]</sup> Discrepancies in the gingival margin level may be due to ectopic eruption of the tooth or due to altered position of the gingiva. A combined orthodontic-periodontic interdisciplinary approach is usually preferred to correct these abnormalities.

#### Corticotomy assisted orthodontic

Corticotomy-assisted orthodontics has been employed in various forms to accelerate orthodontic treatment. Rapid tooth movement associated with corticotomy was first introduced by Henry Krole in 1959.<sup>[7]</sup>

The biology behind corticotomy-assisted orthodontics is the regional acceleratory phenomenon (RAP).

The areas around the cuts are associated with intensified bone response, i.e., increased osteoblastic-osteoclastic activity and increased level of inflammatory mediators, which accelerate the bone turnover and facilitate rapid orthodontic tooth movement

Corticotomy-assisted orthodontics has several advantages such as this procedure reduces the treatment time and facilitates expansion of the dental arch and produces less root resorption rate compared to normal tooth movement due to decreased resistance from the cortical bone.<sup>[8]</sup>

#### Periodontically accelerated orthodontics

It is a revised corticotomy-facilitated technique, which involves a full-thickness labial and lingual flap elevation accompanied by selective surgical scarring of the labial and lingual cortical bones (corticotomy) followed by placement of the graft

material, surgical closure, and orthodontic force application.

#### Piezocision assisted orthodontics

Piezosurgery assisted orthodontics is a new minimally invasive surgical procedure introduced by Dibart *et al.* in 2009. In this technique microincision is performed on the buccal gingiva that allows the piezoelectric knife to give osseous cuts to the buccal cortical plates and initiate RAP. This procedure provides rapid tooth movement without an extensive traumatic surgical approach.<sup>[9]</sup>

So here are few cases referred from orthodontics which were referred for various periodontal procedures.

#### CASE 1

18 yr / F patient was referred from the dept of orthodontics for the removal of high frenal attachment that was hindering the orthodontic tooth movement.

O/E- papillary penetrating type highfrenal attachment was seen.

Treatment – Scalpel Frenectomy was performed for the patient.



a) Pre operative photograph b) Frenectomy done c) Follow up 7 days

#### CASE 2

16/ F patient was referred from orthodontics for the proper positioning of the brackets.

O/E- patient had short clinical crown height with no bone loss.

Diagnosis – Altered passive tooth eruption

Treatment- since there was adequate width of

attached gingiva, gingivectomy was performed for the patient as a method of crown lengthening procedure.



**CASE 3**

25/ F patient was referred from orthodontics for the clinical exposure of impacted teeth. O/E- clinically missing 21, 22, 23 Treatment – surgical exposure of the crown with simultaneous placement of the brackets was carried out for the patient.



a) Preoperative photograph b) Surgical exposure of the crown c) brackets placed on the crown

**CASE 4**

29 /F was referred from the department of orthodontic for carrying out periodontally accelerated tooth movement. Viewing the clinical findings, decision to go for piezocision for periodontally accelerated tooth movement was made. This procedure is used to treat mild to moderate crowding with the advantage of short treatment

time.

The steps involve-

- Flap elevation
- Decortication
- Grafting
- Flap closure
- Force application



a) Preoperative View b) Flap Elevation c) Piezocision being performed

**CONCLUSION**

Periodontal health is essential for any form of dental treatment, especially for orthodontic treatment. The orthodontic treatment has two ways of action on the periodontal tissues; it provides some degree of protection to the periodontium and keeps the gingiva, the bone, and the periodontal ligament in a healthy status but on the other hand, it produces negative effects on the periodontium, mainly gingivitis, gingival recessions, and bone dehiscences, etc. In the recent years, because of the increased number of adults seeking orthodontic treatment, orthodontists frequently face patients with periodontal disease. The combined orthodontic-periodontic interdisciplinary approach could be effective in these situations.

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## Insight and Management of Periodontal Endodontic Lesion: A Case Series

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### Abstract

Endodontic periodontal lesions are the common lesions encountered in day to day practice which are difficult to diagnose and requires a comprehensive treatment planning thereafter. Before the diagnosis is made understanding the etiology for the same becomes important.

This very understanding of the etiology helps us to classify the type of endodontic periodontal lesion and subsequently aids us in the treatment planning. Depending on type of endo perio involvement, treatment to be undertaken whether non surgical or surgical is decided.

**Keywords** – endo periodontic lesions, diagnosis, etiology, treatment plan

### Introduction

Dental pulp and periodontal tissues are closely related that are ectomesenchymal in origin.<sup>[1]</sup> The pulp originates from dental papilla while the periodontal ligament from the dental follicle and the two are separated by herwigs epithelial root sheath. The relationship between periodontal and pulpal disease was first described by Simring and Goldberg in 1964.<sup>[2]</sup> There is general agreement today that the vast majority of pulpal and periodontal lesions are a result of bacterial infection.

Under which conditions and especially in which direction spread

of the disease occurs in the pulpo-periodontal continuum remains a matter of controversy. There are two forms of possible pathways for bacteria and their products connecting the two tissues: anatomical and non-physiological.<sup>[3]</sup> Anatomical pathways-The major connections between periodontal and pulpal tissues are the apical foramina and accessory canals. Third possible route for bacteria and their products, the dentinal tubules.

Non-physiological pathways – These include iatrogenic root perforations, vertical root fractures

There are numerous factors contributing to the endo perio lesions. Primarily these are of bacterial origin from calculus and caries. Foreign bodies may also elicit such lesions like amalgam restorations and root canal filling materials. Apart from these there are several contributing factors such as malocclusion, open contacts, missed canal, trauma, root malformation etc.<sup>[4]</sup>

These endo perio lesions according to simon et al<sup>[5]</sup> may be classified as 1) primary endo lesions 2) primary endo with secondary perio lesions 3) primary perio lesions 4) primary perio with secondary endo lesions 5) combined lesions

The management of these may vary from root canal treatment to periodontal therapy or combination of both.

So here in this case report attempt is

made to get insight into the etiology followed by management of the endo perio lesion.

### Case report 1

36 year old female patient reported to the Department of Periodontology, Government Dental College and Hospital Nagpur with the complaint of pus discharge and slight mobility in upper front teeth region of the jaw since 4 months.

O/E- Patient had a good oral hygiene. Suppuration was seen with respect to left maxillary canine which had grade I mobility. There was no tenderness on percussion. Probing pocket depth of 12 mm was present on mesial, distal and buccal aspect of left maxillary canine (FIG 1). Intra oral periapical radiograph showed radiolucency extending from bone crest to apex around the tooth (FIG 2). But the crux was the presence of open contacts distal to the canine which was the primary etiology in the development of the lesion. This was probably due to unreplaced 26 and 36 which were extracted long ago due to caries (FIG 1). Vitality testing showed that the tooth was non vital. Intraoral periapical radiograph showed radiolucency extending from the bone crest to the apex confirming the presence of endo perio lesion.

### Case management :

Since the tooth was nonvital patient was referred for Root canal treatment. After 3 months of root canal treatment there was slight reduction in the radiolucency surrounding the root (FIG 3.) but suppuration existed. So it was decided to intervene surgically for debridement followed by periodontal regeneration.

### Surgical technique :

A full thickness mucoperiosteal flap was reflected from lateral incisor to first premolar. Vertical releasing incision was given to gain access to the root apex. After complete debridement, to our surprise a huge circumferential defect was seen in relation to left maxillary canine. Demineralised freeze dried bone allograft graft was placed at the site followed by the placement of the collagen membrane (FIG 4). Flap was repositioned and interrupted sutures were placed followed by periodontal dressing. The patient was given

plaque control instructions that included use of 0.12% Chlorhexidine rinse twice daily and to avoid tooth brushing in the operated site.

### Post surgical follow up :

Patient was recalled after 10 days for suture removal. Patient was kept on regular follow up since 9 months (FIG 5). Suppuration has subsided. The tooth has come to normal physiologic mobility. Patient was sent to department of prosthodontics for replacement of missing teeth.



Fig 1: Diagnostic probing pocket depth and missing maxillary and mandibular left first molar

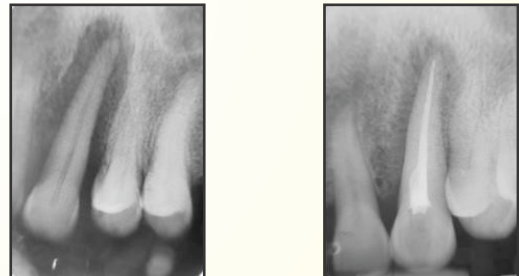
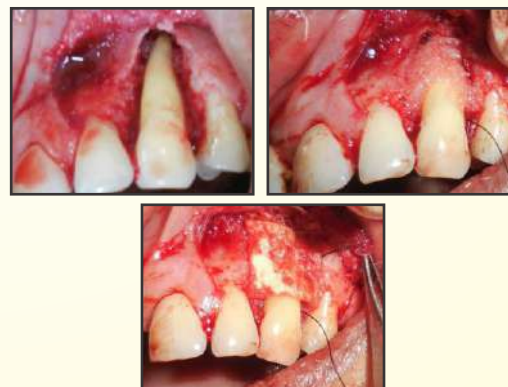


Fig 2: diagnostic IOPA

Fig 3: Post RCT IOPA



4a- Circumferential defect around the maxillary canine

4b- Defect filled with DFDBA

#### 4c- Collagen membrane placed for GTR



Fig 5: Post 6 months IOPA

Fig 6: Post 6 months clinical photograph

#### Case report 2

26/M pt. Came with complaint of pain in lower left back teeth region.

O/E- Patient had a good oral hygiene. Suppuration was seen with respect to left mandibular first molar which had grade III furcation involvement. There was tenderness on percussion. Probing pocket depth of 12 mm was present on distal and buccal aspect of left mandibular first molar. Intra oral periapical radiograph showed radiolucency extending from bone crest to apex around the tooth. Vitality testing showed that the teeth was non vital. Intraoral periapical radiograph showed radiolucency extending from the bone crest to the apex confirming the presence of endo perio lesion.

#### Case management :

Since the tooth was nonvital patient was referred for Root canal treatment. After 3 months of root canal treatment there was slight reduction in the radiolucency surrounding the root but suppuration existed. So it was decided to intervene surgically for debridement followed by hemisection.

#### Surgical technique :

A full thickness mucoperiosteal flap was reflected from. Vertical releasing incision was given to gain access to the root apex. After complete debridement, followed by hemisection done and distal part of tooth was removed. Flap was repositioned and interrupted sutures were placed followed by periodontal dressing. The patient was given plaque control instructions that included use of 0.12% Chlorhexidine rinse twice daily and to avoid tooth brushing in the operated site.

#### Post surgical follow up :

Suture removal was done after 7 days. Patient was kept on regular follow up since 9 months. Patient was sent to department of prosthodontics for crown prosthesis.



Fig 1: Diagnostic probing showing furcation involvement mandibular left first molar

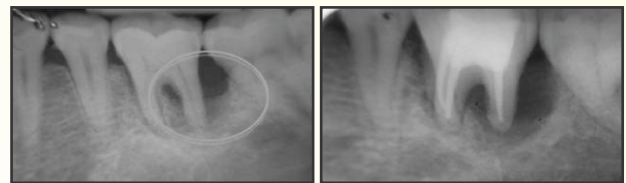


Fig 2: Diagnostic IOPA Fig 3: Post rct IOPA



Fig 4: Hemisection followed by sutures in placed fig 5: post 6 months clinical photograph with crown prosthesis.

#### Case report 3

42/F pt. Came with complaint of pus discharge in upper left back teeth region.

O/E Patient had a good oral hygiene. Pus discharge was seen with respect to left maxillary first molar. There was tenderness on percussion. Probing pocket depth of 10 mm was present on distal and buccal aspect of maxillary first molar and grade II furcation distal 26. Sinus tract was seen with buccal aspect 26.

#### Case management :

Since the tooth was nonvital patient was referred for Root canal treatment. After 3 months of root canal treatment there was slight reduction in the periodontal pocket but furcation involvement existed. So it was decided to intervene surgically

for debridement followed by distal root resection.

**Surgical technique :**

A full thickness mucoperiosteal flap was reflected from. Vertical releasing incision was given to gain access to the root apex. After complete debridement, distal root resection done . Flap was repositioned and interrupted sutures were placed followed by periodontal dressing. The patient was given plaque control instructions that included use of 0.12% Chlorhexidine rinse twice daily and to avoid tooth brushing in the operated site.

**Post surgical follow up :**

Patient was recalled after 7 days for suture removal. Patient was kept on regular follow up since 6months. Patient was sent to department of prosthodontics for crown prosthesis.



Fig: 1 pre-operative intra-oral photograph



Fig:2 Full thickness flap raised

Fig:3 Resected root



Fig:4 Sutures given

**Discussion**

The endo-perio lesions present challenges to clinicians as far as diagnosis and prognosis of the involved teeth are concerned. Correct diagnosis is essential prerequisite to determine the treatment and long-term prognosis. The first step for proper diagnosis is the vitality tests. Although the vitality test cannot provide the histological

status of the dental pulp, their ability to register pulp vitality is quite satisfied. The ability of vitality tests to detect non-sensitive reaction represented a necrotic pulp was reported as 89% with the cold test and 88% with the electrical test.<sup>[6]</sup>

If the rest of the dentition is periodontally healthy and any root cracks and fractures has been ruled out, healing of the periodontal tissues can be expected after endodontic treatment. Therefore, further treatment requirements should always considered followed by an observation period of at least 3 months

Proper endodontic treatment is a key factor for treatment success. Poor endodontic treatment allows canal re-infection and in this way, leads to the treatment failure.<sup>[7]</sup>

The bony lesion in this case had endodontic and periodontal lesions and was first treated with endodontic therapy. Treatment results were evaluated after 3 months and then periodontal treatment was considered. This sequence of treatment allows sufficient time for initial tissue healing and better assessment of the periodontal condition. This case series demonstrates that proper diagnosis, followed by identification of etiological factors and utilizing the different treatment modalities like guided tissue regeneration technique combined with osseous grafting, hemisection and root resection restores the health and function of a tooth with severe attachment loss caused by an endo-perio lesion. So the treatment plan is not completed with the regenerative periodontal therapy or other treatment modality but also requires prosthetic intervention as well. Thus we can say that management of endo periodontic lesion requires a comprehensive interdisciplinary treatment approach.

**Conclusion :**

A perio-endo lesion can have a varied pathogenesis which ranges from quite simple to relatively complex one. Having enough knowledge of these disease processes is essential in coming to the correct diagnosis. It is important to remember that the recognition of pulp vitality is essential for a differential diagnosis and for the selection of primary measures for treatment of inflammatory lesions in the marginal and apical

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# Pre-prosthetic periodontics – A case series

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## Abstract

The interdisciplinary approach has been a trend for a comprehensive dental treatment. Within modern dentistry, periodontics and prosthodontics share an intimate and inseparable relationship in multiple aspects, including treatment plan, procedures execution, outcome achievement and maintenance. By controlling inflammation and preparing sites for proper prosthetic prostheses, periodontists no doubt can provide a solid foundation for successful prosthetic outcomes. On the other hand, prosthodontists could construct proper restorative margin, shapes and contacts that benefit the harmony of periodontium and prosthesis. This article was aimed at addressing the key relationship between prosthodontics and periodontics by presenting some cases.

**Key words:** parafunctional habit, crown lengthening procedure, free gingival graft, socket preservation, ridge augmentation

## Introduction

Comprehensive dental therapy is founded on team works. Of all disciplines within modern dentistry, periodontics and prosthodontics have the strongest and the most intimate connections. For prosthodontics, periodontal health plays an important role on the longevity of restorations. On the other hand, defective prostheses may contribute to progression of periodontal diseases.

To achieve successful treatment outcomes, periodontists and prosthodontist should cooperate in treatment plan, performance and maintenance. This article attempted to address the key relationship between periodontics and prosthodontics. Interaction between periodontal health and prosthetic factors were discussed through cases.

## Case I -

### Parafunctional habit

40 year female came with complaint of severe sensitivity and morning facial muscle pain. On history patient revealed that she had night bruxism habit. Here bruxism (parafunctional habit) was not due to any specific identifiable cause. Parafunctional habit can injured periodontium of the teeth and may induce tooth mobility also. But for the present case tooth mobility was no appreciable. To relieve pain and sensitivity and to maintain vertical dimension, occlusal bite guard (soft splint) was planned. (Fig. 1)

Bruxism is responsible for occlusal tooth wear but can neither induce nor aggravate gingivitis or periodontitis. Bruxism induces jiggling forces, which cause a clinical tooth hypermobility, radiologically seen as a widened periodontal space. Although there is no direct causal relation between bruxism bone loss.<sup>1</sup> Despite the scarce quantity and quality of the literature that prevents sound conclusions on the causal link between bruxism and the periodontal problems, it seems reasonable to

suggest that bruxism can not cause periodontal damage per se.<sup>2</sup>



Pre –op clinical photograph



Post-op clinical photograph



Fig.1

### Case II

#### Crown lengthening procedure

55 year male patient came with complaint of difficulty in chewing. Patient had severe attrition due to improper brushing and tooth powder use. Patients also gave history of hyperacidity since last many years. All the etiological factors acted together and lead severe attrition and abrasion. Mandibular teeth totally ware off with loss of vertical dimension. Full mouth crown lengthening was planned and followed by fix partial denture fabrication. (Fig. 2)

Crown lengthening is one of the most common surgical procedures in periodontal practice. Its indications include subgingival caries, crown or root fractures, altered passive eruption, cervical root resorption and short clinical abutment, and its aim is to re-establish the biologic width in a more apical position. While the procedure in posterior areas of the dentition has been thoroughly investigated, crown lengthening performed for esthetic

reasons in the anterior areas is still a matter of debate.<sup>3</sup>



Fig2

### Case III

#### Attached gingiva augmentation

40 year male patient came with complaint of food lodgement and suppuration in lower front teeth region. Patient had implant w.r.t. 32 & 42. On examination inadequate keratinized gingiva was found around implant. So due to food lodgement and difficulty in oral hygiene maintenance periimplantitis had started around implant. So to increase width of attached gingiva free gingival grafting was done around implant. (Fig. 3)

Adequate quality and quantity of soft tissue plays an integral part in the esthetic and functional outcome of dental implants. Adequate band of attached tissue decreases the incidence of mucositis and improves hygiene around implants. Soft tissue grafting is the only way to improve quality of the tissue around implant. Soft tissue grafting can be achieved at various stages of implant therapy. Epithelial connective tissue grafts are commonly used to increase the band of attached tissue. Subepithelial connective tissue grafts are great for increasing soft tissue thickness and improving the gingival biotype.<sup>4</sup>



**Case IV**

**Socket preservation**

After extraction alveolar resorption takes place which sometime leaves ridge difficult for tooth replacement. To prevent this ridge resorption socket preservation procedure is carried out. 35 year male patient came with complaint of suppuration in upper front teeth. On examination right maxillary central incisor was found vertically fractured which was treated endodontically some year back. On CBCT examination buccal alveolar plate was found severely destructed. So for the present condition socket preservation was planned with tooth extraction followed by implant placement after 6 month. (Fig. 4)

In the esthetic zone, in the case of tooth extraction, the clinician is often confronted with a challenge regarding the optimal decision-making process for providing a solution using dental implants. This is because, after tooth extraction, alveolar bone loss and structural and compositional changes of the covering soft tissues, as well as morphological alterations, can be expected. To combat all the soft and hard tissue alteration soft preservation is the best way for this condition.<sup>5</sup>



Fig 4

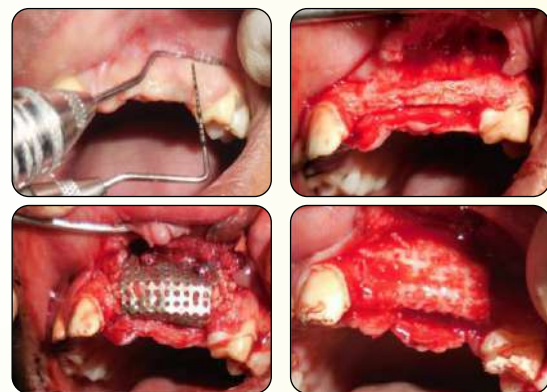
**Case V**

**Ridge aumentation**

22 year female patient came with complaint of missing teeth in upper front teeth region due to

accidental trauma 7 year ago. On examination maxillary left central incisor, lateral ncisor and canine were found missing. Alveolar ridge was deficient in the same region. Horizontal ridge augmentation was planned to augment the alveolar ridge followed by implant placement. (Fig. 5)

Alveolar ridge resorption is inevitable procedure which follows the tooth exfoliation or extraction. An adequate bone volume for complete circumferential coverage of the implants is very important for obtaining a long-term success of oral implants. To avoid these problems various membranes and biomaterials were used, but soft tissue pressure could cause a membrane collapse toward the defect. The ridge augmentation with titanium mesh shaped by adapting it to a bone defect will prevent soft tissue collapse and desired volume of bone augmentation is expectable with it.<sup>6</sup>



**Conclusion**

The relationship between prosthodontics and periodontics is intimate and inseparable. Robust supporting periodontal/peri-implant tissues provide solid foundations for predictable prosthetic therapy. In addition, regaining stable periodontal conditions should rely on establishment of proper contact types, occlusal scheme and quality prosthesis. Frequent and efficient communications are essential between periodontists and prosthodontists through the entire treatment procedures, including plan, treatment procedures and maintenance, since both specialty share a common goal: to create pleasing esthetic with a harmonious stomatognathic system.



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# Cranioplasty

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## Introduction

Cranioplasty is a surgical repair of defect or deformity of skull. Cranioplasty is one of the oldest known surgical procedures, with archaeological evidence of ancient Incans using gold to reconstruct trephination holes around 3000 BC. The earliest written account of Cranioplasty dates from 1505 when Ibrahim bin Abdullah, an Ottoman-era military surgeon, advocated the use of a cranial xenograft from a goat or dog. In 1561, in *Observationes Anatomicae*, the Italian Fallopius described cranioplasty with a gold Plate.

## Indication for Cranioplasty

- Congenital defect
- Post tumour resection
- Post infection
- Infected bone flap
- Post decompressive craniectomy
- Post trauma
- Growing fracture
- Post operation deformity

## Materials use for Cranioplasty

- Autograft
- Allograft
- Biomaterials
- Most commonly Titanium is used as :
  - Titanium is low density metal that allows it to have minimum x ray attenuation and it does not

produce artifact on CT or MRI

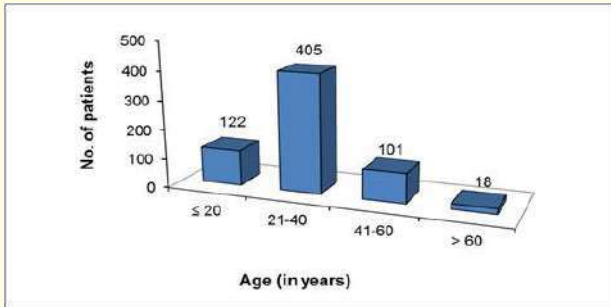
- Titanium is biocompatible material as it forms titanium oxide layer which is highly resistant to corrosion and even this layer is damaged it reforms within milliseconds.
- No reports of titanium allergy, toxicity and tumorigenesis

## Types of Cranioplasty

- Immediate Cranioplasty (1-3 month after Decompressive Craniotomy)
- Late Cranioplasty (3-6 months after Decompressive Craniotomy)
- No significant difference in complications among both Cranioplasty except hydrocephalus which occur more in early Cranioplasty.

## Age Distribution Of Patients

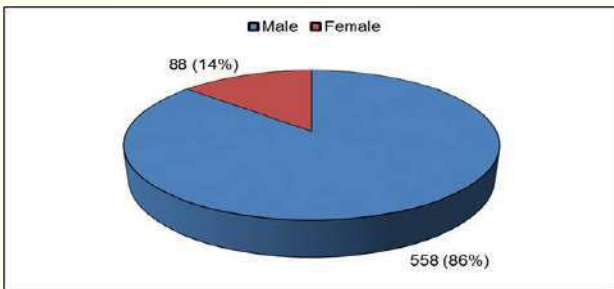
Age (in years)	No. (n=646)	%
≤ 20	122	18.89
21-40	405	62.69
41-60	101	15.63
> 60	18	2.79



This table suggestive of incidence of Craniomaxillofacial trauma is high in age range of 21–40 years.

### Gender Distribution Of Patients

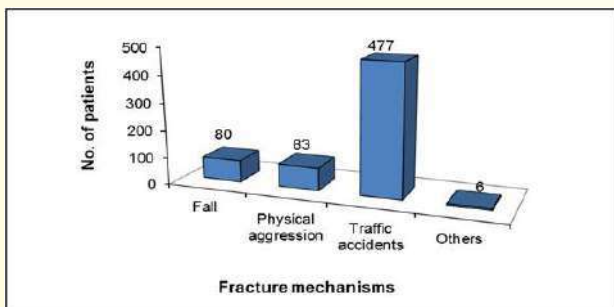
Gender	No. (n=646)	%
Male	558	86.38
Female	88	13.62



This table suggestive of incidence of Craniomaxillofacial trauma is high in Male patient.

### Frequency Distribution According To Fracture Mechanisms

Fracture mechanism	No. (n=646)	%
Fall	80	12.38
Physical aggression	83	12.85
Traffic accidents	477	73.84
Others	6	0.93



This table suggestive of major etiological factor for Craniomaxillofacial trauma is Traffic Accidents.

### Associated Facial Fracture

Type of fracture	No. (n=656)	%
Zygomatico maxillary Complex fracture	196	30.43
Nasoethmoid complex fracture	9	1.40
Frontal sinus fracture	12	1.8
Lefort I/Lefort II/Lefort III	45	6.99
Mandibular fracture	166	25.78
ZMC+Mandible	50	7.76
LefortI+Mandible	12	1.86
LefortII+Mandible	12	1.86
LefortIII+Mandible	10	1.55
Dentoalveolar #	26	4.04
Soft Tissue Injury	109	16.93
ZMC+Nasal #	9	1.40

This table suggestive of incidence of frontal bone fracture is 1.8 % among all craniomaxillofacial fracture.

### Case 1

- Name- DevanandWanjari
- Age- 35 yrs/Male
- Diagnosis- Fracture lefort III, Frontal bone
- Treatment- Open Reduction and Internal Fixation under GA ( Immediate Cranioplasty with reconstruction using Titanium Mesh)
- Date of operation- 4/2/2017

### Pre Op Photographs

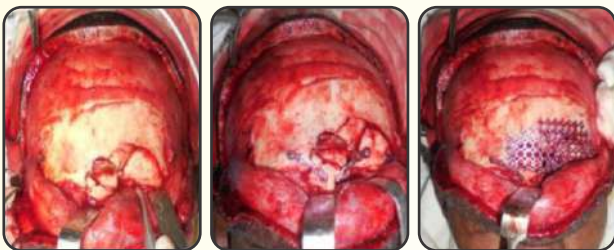


Pre Op photograph showing depressed Frontal region.

### Pre Op Radiographs



### Bicoronal Incision



Bicoronal incision taken. Full thickness Flap elevated. Fracture site exposed. Titanium mesh adapted and fixed over depressed frontal bone fracture.

### Closure



### Post Op



### Post Op 3 D CT Scan



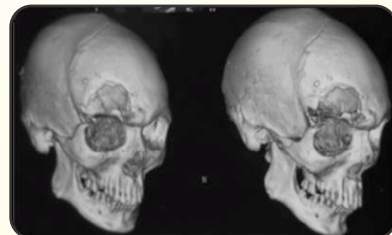
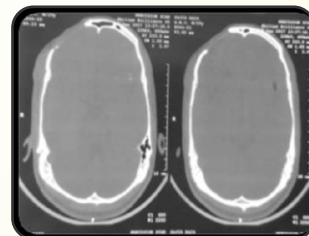
### 2<sup>nd</sup> Case

- Name- Sajid Beg
- Age- 27yrs/Male
- Diagnosis- Post traumatic right frontal bone defect
- Treatment- Delayed Cranioplasty with reconstruction using Titanium Mesh
- Date of operation- 29.3.17

### Pre Op Photographs



### Pre Op CT Scan



3 D CT showing Craniotomy performed over right Frontal region.

### Sterolithographic Model



Sterolithographic model prepared and cut from middle & mirror image created for better contour of right side Frontal bone defect. Titanium mesh adapted over mirror image.

### Hemicoronal Incision



### Adaptation Of Titanium Mesh Over Sterilised STL Model



### Fixation Of The Adapted Titanium Mesh Over The Bony Defect



### Antibiotic Application



(Ceftriaxone antibiotic powder applied after reconstruction by Titanium Mesh to avoid infection)

### Closure



### Post Op



### Post Op Radiograph



### Conclusion

Cranioplasty technique should produce excellent aesthetics, the ability to withstand direct trauma without failure, have minimal effects on the patient in terms of morbidity, and be stable in the long term.

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# Buccal fat pad use in Oral submucous fibrosis

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## Introduction

Oral submucous fibrosis (OSMF) is a peculiar, progressive, incidious, irreversible, chronic, crippling disease of the oral cavity, characterized by fibrotic change and severe burning sensation with restricted opening of the mouth. It largely affects people of south East Asia and immigrant populations from this area in other parts of the world.

The management of oral submucous fibrosis can be dealt with two broad categories: medical and surgical. The medical management includes multiphase injections of hyaluronidase, hydrocortisone, placental extract, triamcinolone plus vitamin, and iron supplements. Intralesional steroids are probably satisfactory only in cases with minimal impairment of mouth opening.

Different surgical procedures described in the literature claim different success rates. The use of buccal fat pad as a grafting source is relatively recent. The buccal fat pad is a supple and lobulated mass, easily accessible, and mobilized.

This article presents two cases with proven oral submucous fibrosis, with mouth opening less than 1 mm, involving the buccal mucosa were treated surgically in the Department of Oral and Maxillofacial Surgery, Government Dental College and Hospital,

Nagpur. Buccal fat pad was used as an interpositioning material to cover the raw areas in the oral cavity after incision and release of fibrous bands. All the patients had marked trismus.

## Case 1

A 33 year old female patient, resident of Nagpur, reported to the Department of Oral and Maxillofacial Surgery, Nagpur with chief complaint of Reduced mouth opening since 6 months. Patient had habit of chewing betel nut since childhood 2-3 Betel nuts/day.

On examination there was nil interincisal mouth opening & restriction to all excursive movements of mandible. Past medical & dental history was not significant.

Diagnosis of this patient is Oral Submucous Fibrosis : Group IV A (K h a n n a and A n d r a d e classification). Treatment planned for this patient was bilateral fibrotomy with buccal fat pad reconstruction.

The surgery was performed under general anesthesia with fiberoptic nasal intubation. Incision was placed along the occlusal plane with the surgical knife on the buccal mucosa away from Stenson's duct orifice. The incision was placed posteriorly to the retromolar area and at the anterior most point to the corner of the mouth. The fibrous bands were detected by digital

palpation. Using fingers dissection made and fibrous bands were released. The wounds created were further freed by manipulation till no restrictions were felt. The mouth was then forced to open with the mouth gag to an acceptable range of approximately 30 mm. The coronoid process was approached from the wounds created. The coronoid process was exposed by subperiosteal dissection. Using bur the coronoid process was osteotomised and coronoidotomy was performed. The mouth was opened and the intraoperative opening was measured between upper and lower incisors of about 44 mm. A small amount of the lesions were excised and sent for biopsy. Extractions of all the third molars was done.

The buccal fat pad was approached on the posterior superior margin of the created buccal defect, that is, posterior to the zygomatic buttress. After blunt dissection, through the sub mucosa the buccal fat pad was mobilised gently until a significant amount was obtained to cover the defect without tension. This was done by using small artery forceps and gently letting out the buccal fat pad to the raw area. Buccal fat pad was used as a graft material to cover the areas. The buccal fat pad was secured in place by horizontal mattress sutures or simple interrupted sutures with 3/0 Vicryl. The same procedure was performed on the other side. The buccal fat pad covered the buccal defects posteriorly to the retromolar area and anteriorly to the corners of the mouth.



**Case 2**

A 33 year old male patient, resident of Madhya Pradesh, reported to the Department of Oral and Maxillo-facial Surgery, Nagpur with chief complaint of Reduced mouth opening since 5 years. Patient had habit of tobacco chewing since last 15 years 2 packet /day. On examination there was nil interincisal mouth opening restriction to all excursive movements of mandible. Past medical & dental history was not significant.

Diagnosis of this patient is Oral Submucous Fibrosis : Group IV A (Khanna and Andrade classification). Treatment planned for this patient was bilateral fibrotomy with buccal fat pad reconstruction. Same surgical procedure was performed as described above.





Post operative mouth opening

Both patients received prophylactic antibiotics. The regime was Amoxicillin 1 gm IV before intubation. Ryle's tube was kept for feeding. Both the patients had liquid diet postoperatively for at least 1 week. The patients were instructed to use 10mL of chlorhexidine mouth rinse at 8 hourly. Mouth opening exercises were started postoperatively after 36 hours using Fergusson's mouth gag or wooden spatulas carried out at 15–20 times thrice daily for at least 6 months for all patients. The patients were instructed to stop the deleterious habits strictly. The patients were called for follow-up every month.

### **Discussion**

Oral submucous fibrosis as an insidious chronic disease affecting any part of the oral cavity, although occasionally preceded by and/or associated with vesicle formation, is always associated with juxtaepithelial inflammatory reaction followed by fibroelastic changes.

Evidence from studies suggest that areca nut use among oral submucous fibrosis cases and a defined dose dependent relationship between areca nut and the causation of the disease exist. Daily use appears to be more important than the duration of the habit. Both frequency and duration of chewing were important for the development of oral submucous fibrosis. The commercially freeze-dried products such as pan masala, Guthka, and mawa (areca and lime) have high concentrations of areca nut per chew and cause oral submucous fibrosis more rapidly than self-prepared conventional betel quid which contains smaller amounts of areca nut.

The medical management has been extensively reported in the review literature with low-grade evidence to support recommendations for the nonsurgical management of oral submucous fibrosis.

The surgical procedures primarily aimed at

the surgical elimination of fibrotic bands. The buccal fat pad is a supple and lobulated mass, easily accessible, and mobilized. Anatomically, the buccal fat pad is described as consisting of a central body and 4 extensions buccal, pterygoid, pterygopalatine, superficial, and deep temporal. The main body is situated deeply along the posterior maxilla and upper fibers of the buccinator. The buccal extension lies superficially within the cheek and is mainly responsible for cheek fullness. The buccal extension and main body together constitute 55% to 70% of total weight. The blood supply of the buccal fat pad comes from 3 sources: maxillary artery (buccal and temporal branches), superficial temporal artery, and transverse facial artery. It is often encountered accidentally during maxillary orthognathic operations and there have been reports in children of spontaneous or traumatic herniation of buccal fat pad. The easy mobilisation of the buccal fat pad and its excellent blood supply and minimal donor site morbidity makes it an ideal flap. The main advantages of buccal fat pad are ease of harvesting, simplicity, versatility, low rate of complications, as well as quick surgical technique. The operation can be performed in one incision, affecting neither appearance nor function of the area. It has been used as pedicled graft in facial augmentation procedures, for the repair of persistent oroantral fistulas after dental extractions and in the reconstruction of small and medium size maxillary defects after resection of a tumor.

The buccal fat pad by virtue of its anatomic position and excellent blood supply, the ease with which it can be accessed and mobilized, without any donor site morbidity, proved to be a logical, convenient, and reliable interpositioning material. The procedure considering the anatomic proximity of the donor and recipient site is not a lengthy one. The graft can be approached through the same buccal incision which was used to release the fibrotic bands. Should it fail, the consequences are not serious, as other options are open. The volume of buccal fat pad was found to be adequate, and it maintained its position as an interpositioning material postoperatively. Postoperative healing



was uneventful with no evidence of infection in both the cases.

### Conclusion

The use of buccal fat pad has proved effective in treatment of OSMF in patients with 0 mm mouth opening. The mouth opening achieved intraoperatively should be maintained by continuation of rigorous mouth opening exercise post-operatively

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# Secondary cleft nose Rhinoplasty

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## Introduction

Cleft lip and palate is most common congenital anomaly affecting the human being. In the world 1:800 babies are today born with this anomaly. The nose forms a prominent part of the face. Ironically, a masterly executed cleft lip repair directs the beholders' eyes from the deformed lip to the deformed nose. Also nose plays an important role in all social interactions because of its central location on the face. Rhinoplasty is an art and science to correct various deformities of nose, in addition to which function can also be improved. Rhinoplasty can be performed to meet aesthetic goals or for reconstructive purposes to correct birth defects or breathing problems. The aesthetic effects are significant with an impact on influence of the psychological status of the patient

The cleft-lip nasal deformity presents a formidable challenge in rhinoplasty. The 3 main factors contributing to this deformity are congenital anatomic deficiency or aberrancy, surgical scarring from previous reconstructive attempts, and changes related to growth. Early surgical correction of nasal deformities improves psychosocial development and removes the stigma of an abnormal appearance and multidisciplinary approach is the key for the complete rehabilitation of cleft patients

## BACKGROUND/HISTORY

Ancient Indian surgeon Sushruta (600 BC in Sushruta Samhita) described the first attempt of repair of mutilated nose. The first attempted cleft lip-nasal repair is purported to have taken place around 400 AD by a Chinese physician. Early in the history of cleft nasal repair the functional and cosmetic results varied widely from excellent to very poor. Many expressed concern about the proper growth and development of the nose with primary or early surgical intervention and deferred correction until adolescence or early adulthood.

## UNILATERAL CLEFT NASAL DEFORMITY

The unilateral deformity results from tissue deficiency of the cleft lip, deficiency in the bony premaxilla, and abnormal muscle pull on the nasal structures.

### Clinical features:

- The base of the columella is deviated toward the noncleft side.
- The cartilaginous septum is convex on the cleft side, which produces airway obstruction.
- The tip of the nose and the septum is deviated to the noncleft side.
- On the cleft side, the angle between medial and lateral crura is excessively obtuse, which results in depressed dome.
- The cartilage on the cleft side

may be smaller and thinner than the normal side.

- The cleft-side nostril may have a web close to the pyriform aperture.
- The nostril on the cleft side may be smaller or larger than the noncleft side.
- The cleft side ala buckles inward.
- The base of the ala is caudally displaced on the cleft side.
- The ala-facial angle is flattened.
- The nasal floor on the cleft side may be wide or narrow.

#### Features of bilateral cleft nasal deformity

- Medial crura are displaced laterally with bases partially submerged in the prolabium
- Alar domes are laterally displaced, and the angle between medial and lateral crura is obtuse, which results in broad and bifid tip
- The lateral crura are displaced downward, which causes hooding of the nostril.
- Alar cartilage may protrude in the vestibule
- Alar bases are displaced laterally, which causes bilateral flattening of alar-facial angle and wide nostril floor.
- Nasolabial fistulas may be present
- The position of cartilaginous septum depends on the asymmetry of the cleft deformity

#### INDICATIONS FOR RHINOPLASTY

- A nose that is too large or too small compared to other facial features.
- A wide nose.
- A hump on the bridge of the nose.
- A bulbous tip.
- A tip that is enlarged, droops, or protrudes.
- A crooked or off-centre nose.
- Excessively flared or pinched nostrils.
- An asymmetrical or irregularly shaped nose due to injury.
- A defect that causes difficulty breathing.

#### Goals of the surgery

- Achieve normal speech,
  - Acceptable aesthetic facial appearance,
  - Unobstructed nasal passages,
  - Absence of psychological pathology related to body dysmorphism.
  - Selection of proper technique
  - Focus on minimizing soft tissue scarring
- #### Step–Ladder Principle
- Ugly nose can be made better nose
  - Normal nose can be made pretty nose
  - Ugly nose cannot be made pretty nose

#### The principles of correction of the cleft lip nasal deformity as follows:

- ž More severe the deformity, the earlier and more radical the secondary procedure
- ž Correction of the nasal deformity is designed to improve form and function and to alleviate psychological stress
- ž Correction of nasal deformities includes the skeletal base, the septum, the tip, and the alae
- ž Bone grafting and cartilage augmentation may be indicated
- ž Definitive rhinoplasty is performed when the patient is 14 years of age or older
- ž Severe asymmetry of the skeletal base is a contraindication to definitive rhinoplasty

#### Step by step procedure for secondary rhinoplasty

(1) incisions, (2) elevation of the soft tissue envelope, (3) confirmation of preoperative diagnosis and reassessment of grafting requirements, (4) septoplasty (5) establishment of desired tip projection and reconstruction of the nasal tip complex, (6) dorsal modification and osteotomies, (7) final tip cartilage positioning and shaping, (8) wound closure, and (9) application of splints and dressings.

The open or external approach is usually preferred as this approach allows superior visualization for diagnosing deformities and better exposure for suturing structural grafts. In addition the open approach provides excellent access to the caudal septum. The lower lateral cartilage can be exposed and released from the lateral attachments and repositioned to redefine the dome and tip defining points and to increase

the anteroposterior projection of the nose. A columellar strut graft is often useful in providing additional structural support to the tip and facilitating lengthening and projection of the nasal tip. The columella is oriented obliquely and foreshortened on the cleft side, with its footplate displaced and tethered inferiorly, whereas the base is deviated to the non cleft side. Repositioning the lower lateral cartilage can be sufficient to restore the columella, although more severe cases require local flaps for correction. Septal deviation is inherent to cleft lip-nasal deformities and contributes greatly to the overall distorted external appearance of the nose in addition to creating functional nasal obstruction. Correction of septal deviation is paramount to alleviating nasal obstruction in patients with a cleft nose. Some controversy exists about the optimal timing of septal surgery. Early septal surgery disrupts natural septal development, whereas others feel that delaying treatment disrupts normal maxillary growth.

**CASE 1** Problem List

18 Year female patient reported to department of oral and maxillofacial surgery with complaint of poor appearance of nose patient gives the h/o cleft lip & palate since birth & underwent surgery of cleft lip in infancy and cleft palate at age of 5 yrs. She also complains of malalignment of teeth.



**Problem List :**

Deviation of the nose towards rt side

Columellar deviation  
short collumella

Alar Flare of lt nostril with nostril mismatch

Bulbous nasal tip

**Addressing the case :**

- Open tip rhinoplasty for skelitinisation of the dome and lateral crura
- Harvesting of the auricular cartilage graft for reconstruction of hypoplastic cartilage of cleft side

Bolster stitch as external splint and merocell pack for internal splinting



**Post op**



**Case 2**

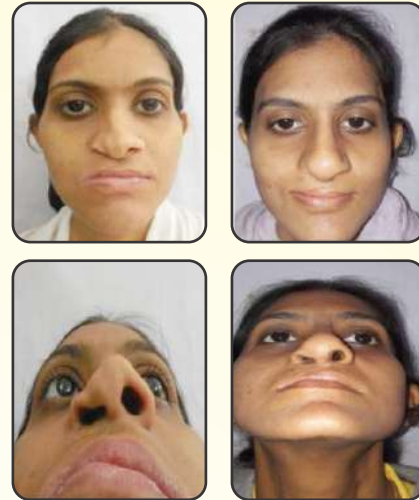
26 yr old female pt reported to dept of oral and maxillofacial surgery with chief complaint of poor facial appearance since childhood pt is k/c/o cleft lip and palate for which she was operated at the age of 1.5 year for lip repair and again at the age of 2 years for palate repair she

was operated against the age of 14yrs for cleft palate repair, she also gives history of distractors placement bilaterally 10 years back in upper jaw which were removed 4 months later after the placement.



**Problem list :**

- Deviation of the nose towards lt side
- Collumellar deviation
- short collumella
- Alar Flare of rt nostril with nostril mismatch
- Depressed dome



**Addressing the case**

- Open tip rhinoplasty for skelitinisation of the dome and lateral crura
- Harvesting of the auricular cartilage graft for reconstruction of hypoplastic cartilage of cleft side
- Using silicon implant as strut graft
- Bolster stitch as external splint and merocell pack for internal splinting

**Case 3**

17 Year female patient reported to department of oral and maxillofacial surgery with complaint of deformed nose patient gives the h/o cleft lip & palate since birth & under went surgery of cleft lip at the age of 5 months and cleft palate at age of 1year .



**Problem list :**

- Deviation of the nose towards rt side
- Collumellar deviation
- short collumella
- Depressed dome on rt side

Alar Flare of Lt nostril with nostril mismatch

**Addressing the case :**

- Open tip rhinoplasty for skeletonisation of the dome and lateral crura
- septoplasty and septal cartilage harvest, for reconstruction of hypo plastic cartilage of cleft side
- Bolster stitch as external splint and nasal pack for internal splinting



**Case 4**

26 Year female patient reported to department of oral and maxillofacial surgery with complaint of presence of external device in her jaw since 6

months and deformed nose since birthPt. is an operated cae of cleft lip and palae at age of 2 years, also operated for maxillary deficiency using distraction osteogenesis bilaterally 6 months back.



**Problem list :**

- Deviation of the nose towards rt side
- Collumellar deviation
- short collumella
- Alar Flare of Lt nostril with nostril mismatch
- Depressed dome

**Addressing the case :**

- Open tip rhinoplasty for skeletonisation of the dome and lateral crura



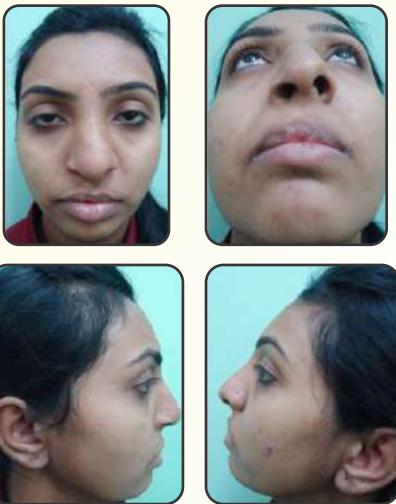
**Post op**





**Case-5**

22 Year female patient reported to department of oral and maxillofacial surgery with complaint of deformed nose since birth Pt. is an operated case of cleft lip at age of 6 months and palate at age of 18 months.

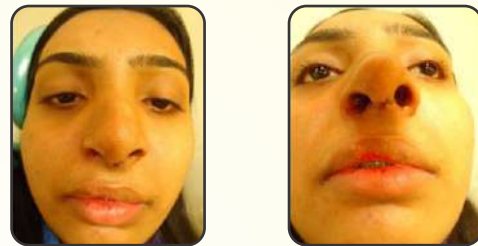
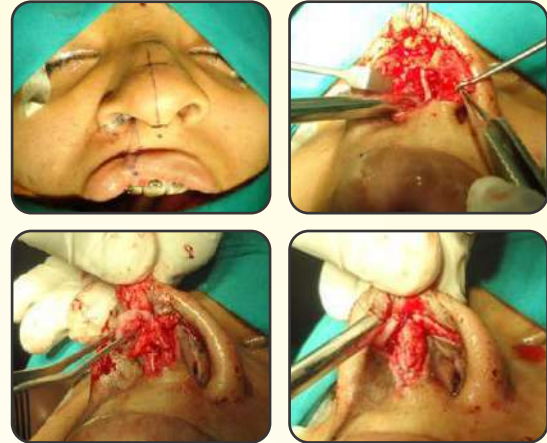


**Problem list :**

- Deviation of the nose towards left side
- Collumellar deviation
- short collumella
- Alar Flare of rt nostril with nostril mismatch
- Depressed dome

**Addressing the case :**

- Diamond shaped wedge resection on right side
- Open tip rhinoplasty for skeletonisation of the dome and lateral crura
- Reduction of bulbous tip by removal of fibro fatty tissue
- Harvesting of the septal cartilage graft for reconstruction of hypo plastic cartilage of cleft side
- Bolster stitch as external splint and nasal pack for internal splinting



**Post op**



**Results:**

Total 5 patients including all female patients with mean age at the time of surgery was 22yrs ( range 17-26yrs had undergone secondary cleft rhinoplasty ,in 2 patients chonchal cartilage graft was used to augment the hypoplastic alar cartilage, in 1 patient silicon spreader graft along with patients chonchal cartilage graft was used& in in 2 patients septal cartilage graft was used to augment the hypoplastic alar cartilage.All the patients were extremely satisfied with their post op facial appearance.

## Discussion

The cleft nasal deformity seen in patients with unilateral and bilateral cleft lip presents a formidable challenge for the cleft and craniofacial surgeon. The underlying anatomic deformities combined with scarring from previous procedures make secondary cleft rhinoplasty a difficult procedure for even the most experienced surgeons. Numerous techniques for secondary cleft rhinoplasty have been described in the literature over the past several decades, yet the lack of wide adoption of any given technique highlights the great variability seen with this problem.

Regardless, the fundamental goals of achieving nasal symmetry with definition of the nasal base and tip, correction of nasal airway obstruction, and repair of nasal scarring or webbing have driven the progressive evolution of techniques developed to correct various aspects of the cleft nasal deformity. Despite the number of techniques that have been published, very few studies have looked specifically at outcomes in secondary cleft rhinoplasty, and further work is needed in this area.

## Open vs. Closed Approach

The open or external approach is usually preferred as this approach allows superior visualization for diagnosing deformities and better exposure for suturing structural grafts. In addition the open approach provides excellent access to the caudal septum, which is usually significantly deviated and poorly supported. In all our patients we used either a stair step or an inverted notched-V incision with flying bird extension incision to approach the nasal cartilage. In the bilateral deformity, a midline V-to-Y or forked flaps can create additional columellar soft tissue necessary to increase projection. It permits mobilization and repositioning of unscarred key elements of the nasal tip under direct vision

## TIMING OF THE SURGERY

The controversy existed about timing of corrective surgery for cleft nose deformity in case of earlier repair the procedures that produce excellent results in early years of life may not retain their earlier promise as the face grows and

matures.

Peet and Paterson and others recommended delayed nasal repair. They suggested that altering the cartilages would complicate future corrective surgery, and altering nasal cartilages may complicate future nasal surgery. Secondary cleft rhinoplasty allows completion of orthodontic correction of the skeletal base to allow as much growth and development of the lower lateral cartilages as possible and thus to have a stronger, more stable support for the reconstructed nasal tip, it also allows bone grafting of the hypoplastic maxillary segment on the cleft side, which when performed in patients aged eight to nine years results in a more symmetric alar base.

## Conclusion

Secondary rhinoplasty is best performed after the patient reaches bony maturity and maxillary deficiencies have been treated appropriately with orthodontic and orthognathic procedures. An open approach provides the best exposure to the nasal tip, and provides an unobstructed view of the middle vault and bony dorsum. Autologous cartilage grafts, harvested from the septum or ear are often necessary to provide structural support and to restore acceptable contours. Harvested cartilage is used to project the nasal tip, support the external nasal valves, and reconstruct the internal nasal valves.

Ralph Millard said: "Know the normal, find it and place it in normal position, throw away nothing until it is proved useless, borrow from an area of excess to correct an area of need only when it can be afforded, do not get shackled in routine but look at each case individually



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# Management of secondary defects of cleft lip and palate

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## Introduction

Secondary cleft deformities are common problems encountered by the cleft lip and/or palate patients. The initial or primary repair of cleft lip and palate is usually completed during the first year of life. The secondary corrective surgical procedures range from scar revision, oronasal fistulae repairs, alveolar clefts, correction of nasal deformities, velopharyngeal incompetence to speech therapies and even procedures to move and stabilize the upper and lower jaws. The timing and sequence of surgical correction of secondary deformities do not have a single particular protocol, instead they vary according to the type and severity of the problem and highly depend upon patient and their growth. Indications of these surgeries are the functional and aesthetic malformations that affect the patient's quality of life and cause negative psychosocial burden. According to Ralph Miller, "Know the normal, find it and place it in normal position, throw away nothing until it is proved useless, borrow from an area of need only when it can be afforded, do not get shackled in routine but look at each case individually."

Thus, an aggressive surgical plan focused mainly on the deformities that can objectively achieve functional and aesthetical improvement are individualized for each patient and resultant patient outcome is measured in terms of

surgical effectiveness and patients satisfaction.

## MATERIALS AND METHODS

Total 3 cases of the secondary cleft deformities reporting to the department of oral and maxillofacial surgery at Government Dental College and hospital were included in this study. The mean age of the patients ranging from 21 to 28 years who underwent secondary cleft surgeries for various reasons. The patients had undergone the primary correction of the cleft lip & palate at the age of one year and have not received any further treatment. Diagnosis of the deformity was made by means of clinical, radiological and cephalometric assessment (orthopantomogram, lateral and frontal cephalometric X-rays). Surgical procedures included the alveolar bone grafting, correction of the jaw deformity, closure of the palatal fistula, rhinoplasty procedure and redo of the lip for improvement of the face aesthetics. Thus presenting a case series of few cases among many that have been successfully treated in our department.

## CASE 1

A 24 Years old female with Hypoplastic maxilla secondary to cleft lip and cleft palate reported to the department of oral and maxillofacial surgery with chief complaint of poor aesthetics, bulbous deformed nose. She was an operated case of cleft lip and palate. On examination, she presented with

concave facial profile, malocclusion i.e. Anterior cross bite, constricted maxillary arch. Two stage procedure was done. In stage 1, Distraction osteogenesis was done and the second stage consisted of distraction removal, septo-rhinoplasty where ear cartilage was harvested and inset into the deficient septal cartilage. The patient has excellent aesthetics after 1 year of follow up. Pictures as shown.

Figure 1:

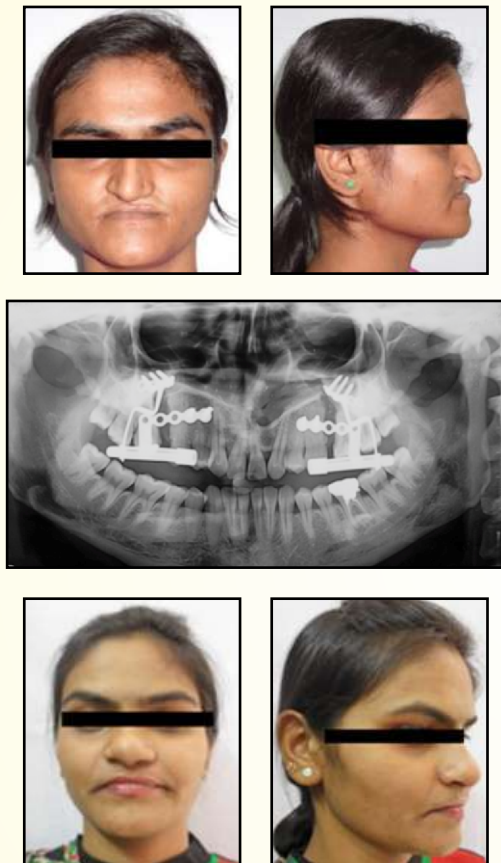


Figure 1: A shows preop frontal profile, B – Preop lateral profile, C – OPG showing bilateral maxillary alveolar distractors in place, D post operative frontal view and E – Post operative lateral profile of the patient.

### CASE 2

A 26 year old female with skeletal class iii secondary to cleft lip and palate repair presented to the department with secondary residual deformities i.e. deformed nose, alveolar cleft, hypoplastic maxilla with high arched palate resulting in anterior cross bite. Alveolar Maxillary distraction was planned in stage 1

surgical procedure which was followed by Mandibular setback using bilateral sagittal split ramus osteotomy and pyriform rim augmentation. After 6 months, Stage 3 was planned where septal rhinoplasty using auricular cartilage and Dorsal Augmentation with Eurosilicon Implant was performed. Patient Is happy with her esthetics and still under the follow up and no new complaints or complications have been reported till date. Figures2

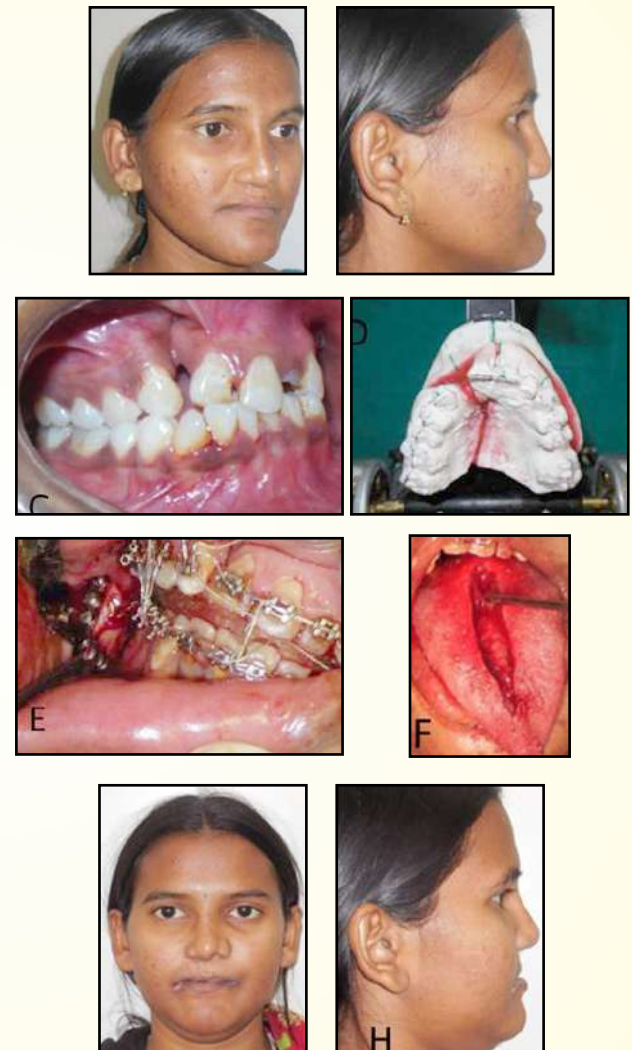


Figure 2: A – preoperative frontal photograph, B showing the malocclusion and right alveolar cleft, C- OPG showing bilateral maxillary distractors in place, D – Harvesting of the auricular graft, E – Inset of the graft and dorsal augmentation using silicon graft, F – Postoperative frontal view of the patient.

**CASE 3**

A 25 year old female with hypoplastic maxilla reported to the department of oral and maxillofacial surgery with chief complaint of poor esthetics and a bucket list of problems including a concave profile with cleft alveolus on right side, resulting malocclusion and severely rotated maxillary segments. Her treatment plan was presurgical orthodontic alignment of the upper and lower arches to correct the dental malocclusion followed by asymmetric Bilateral sagittal split osteotomy in which differential setback of the ramus was performed along with reduction genioplasty and glossectomy in order to reduce the size of the tongue.

A female patient who was rejected for marriage proposals many times is now a happy mother of two kids. No relapse of the orthognathic procedures has been noted.

**DISCUSSION**

The secondary deformities can be as a result of the sequelae of congenital cleft lip and/or palate or consequence of failure of the primary corrective procedure. They represent one of the most challenging reconstructive procedures as the normal anatomy is already altered, muscles are hypoplastic, the position of vital structures are altered, surgical scarring from the previous operations and the patient is already under psychological stigmata. The final result of secondary deformity not only depends on the extent of the inborn defect, the development of the affected area, individual healing ability, and the therapeutic method used, but also on additional factors such as the patient's cooperation and the subjective perception of his or her deformity.

We conclude that combination of various secondary surgical procedures done simultaneously or separately can help the patients boost up confidence and result in more acceptance in the society with a better quality of life. We determine that these dramatic positive outcomes for the correction of these deformities can easily be tolerated and accepted by all our patients. This is infact more encouraging for the management of new patients in the future.



Figure 3: A and B showing pre-operative lateral views of the patient, C – preoperative malocclusion, D – Mock surgery for differential lefort osteotomy, E – Asymmetric Bilateral Sagittal Split ramus osteotomy, F – Glossectomy, G – post-operative frontal view, H – Post-operative lateral profile view.



# Non Surgical Retreatment

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Nonsurgical endodontics is a therapy with a high success rate. Unfortunately, some cases present with endodontic failures. Nonsurgical retreatment is generally the preferred treatment for failing root canal therapy. It is most effective in cases when the etiology can be addressed through an orthograde approach. Teeth with poor obturation, missed canal space, and coronal leakage should be retreated nonsurgically first.

## Contents

1. Management of perforations
2. Management of instrument separation
3. Management of missed canals

## Case I :

### Management of perforation



Perforations can occur pathologically as a result of resorption and caries or iatrogenically during root canal treatment.

Such perforations might compromise the treatment outcome and persist as a significant complication if not repaired.

Classification: BY **Fuss & Trope**

**Coronal perforation** –coronal to the level of crestal bone and epithelial attachment with minimal damage to the supporting tissues and easy

access, Good Prognosis.

**Crestal perforation** –at the level of the epithelial attachment into the crestal bone, Questionable Prognosis.

**Apical perforation** –apical to the crestal bone and the epithelial attachment, **Good Prognosis.**

- Perforation acts as an open channel encouraging bacterial entry either from root canal or periodontal tissues or both eliciting inflammatory response that results in fistulae including bone resorptive processes may follow.
- When perforation occurs laterally or in furcation area there might be over growth of gingival epithelium towards the perforation site worsening prognosis of the tooth .
- **TSESIS I, FUSS Z. Diagnosis and treatment of accidental root perforations. [9]Endodontic Topics. 2006;13:95–107.**
- Various materials used for perforation repair include
  - 1. Indium foil
  - 2. Amalgam
  - 3. Plaster of Paris
  - 4. Zinc Oxide Eugenol
  - 5. Super EBA
  - 6. IRM (Intermediate Restorative Material)
  - 7. Gutta Percha
  - 8. Cavit
  - 9. Glass Ionomer Cement
  - 10. Metal-Modified Glass

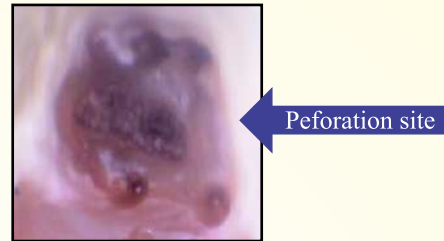
**Ionomer Cement**

- 11. Composite
- 12. Dentin chips
- 13. Decalcified Freezed Dried Bone
- 14. Calcium Phosphate Cement
- 15. Tricalcium Phosphate Cement
- 16. Hydroxyapatite
- 17. Calcium hydroxide
- 18. Portland Cement
- 19. MTA
- 20. Biodentine
- 21. Endosequence

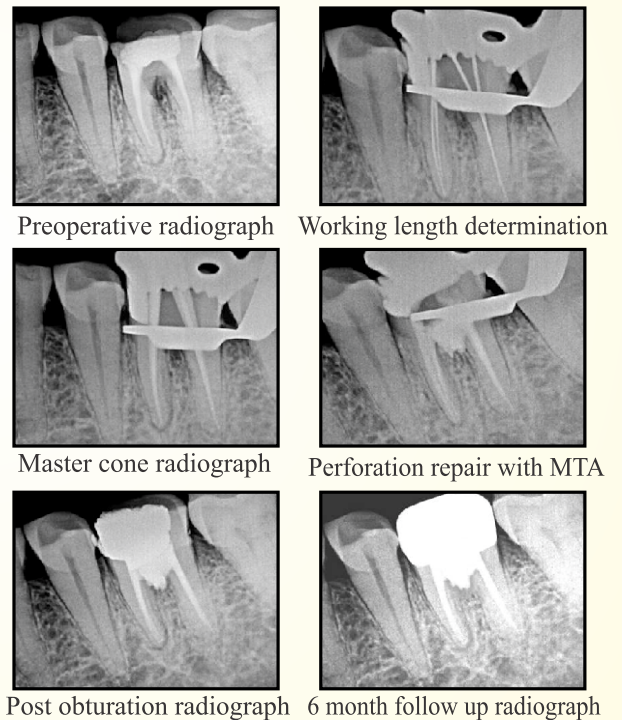
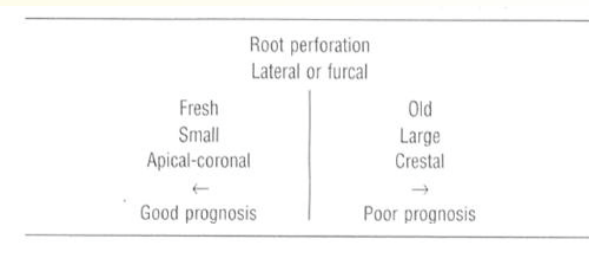
22. New Endodontic Cement.

periapical radiograph of 36 showing radioopaque material in coronal part suggestive of temporary filling material. Radiolucency extending beneath radioopaque material involving pulp chamber and extending beyond pulpal floor suggestive of iatrogenic furcal perforation With 36.

Final diagnosis- Iatrogenic perforation with 36  
Treatment plan- Perforation repair with biocompatible material MTA/Biodentine.



**Intraoral clinical photograph**



**Case II :  
Management of instrument separation**



**Case history**

Name of the patient- Mrs. Saroj chauhan  
Age – 42 yrs  
Sex- female  
Address- Manewada Nagpur  
Chief complaint- Pain with lower left back region of jaw since 4 days  
HOPI- patient was apparently alright 10 days back. Then she experienced pain with lower left back region of jaw and sensitivity to hot. Then patient visited private clinic in nagpur and pain increased after treatment done by the dentist . Then patient came to GDCH,Nagpur for the same.

Diagnosis- chronic apical periodontitis with 36  
Radiographic interpretation- Intra oral

- When a file fractures during root canal treatment there are several treatment options available to the clinician.

WHAT ARE THE OPTIONS?

- LEAVE FRACTURED INSTRUMENT IN SITU
  - REMOVE FRACTURED INSTRUMENT
  - BYPASS FRACTURED INSTRUMENT
- HOW SUCCESSFUL ARE CLINICIANS AT REMOVING INSTRUMENTS AND WHAT INFLUENCES THAT SUCCESS?

- Location, length, type and material of fractured instrument
- Tooth/canal involved
- Clinician's skill and available armamentarium

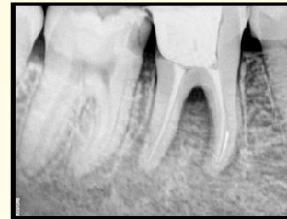
Table 1 Summary of the devices and techniques which have been advocated in the literature to remove fractured instruments. All of the mechanisms in the table are effective only in the straight section of the root canal

Device category	Method	Manufacturer	Reference(s)	Mechanism of action
Ultrasonics	Ultrasonic tips	Various manufacturers	Ruddle, 2004 <sup>12</sup> Ward et al, 2003 <sup>8</sup> Suter et al, 2005 <sup>17</sup> Fu et al, 2011 <sup>46</sup>	Creation of a 'staging platform' around the head of the fractured file. File removed by agitation/unwinding.
Microtube devices	Masserani kit	Mikro-Mega, Besançon, France	Nagai et al, 1986 <sup>23</sup>	A range of trephine and extractor (various sizes) designed to grip the head of the fractured file.
	Cancellier kit	SybronEndo, CA, USA	Spriggs et al, 1990 <sup>8</sup>	A range of tubes which engage the head of the file with the aid of a cyanoacrylate adhesive. Requires initial creation of a staging platform with ultrasonic files.
	Endo Extractor	Brasseler, GA, USA	Gettleman et al, 1991 <sup>45</sup>	A range of trephines and drills that accommodate the head of the instrument.
	Meitrac system	Hager and Meisinger, Neuss, Germany	Ruddle, 2004 <sup>12</sup>	A range of trephines and extractors, available as three kits. The instrument must initially be freed coronally by creation of a 'staging platform'
	Instrument Removal System (IRS)	Dentsply Maillefer, Ballaigues, Switzerland	Ruddle, 2002 <sup>22</sup>	A device in two sizes designed to grip the head of the file. Requires creation of an ultrasonic staging platform in the first instance.
Pliers/forceps	Steiglitz forceps	Various manufacturers	Hülsmann, 1993 <sup>38</sup>	Specialised forceps which grip the head of the fractured instrument, only effective if the fractured instrument is in the coronal aspect of the canal.
Other	Canal finder system	Endo Technic, CA, USA	Hülsmann, 1994 <sup>38</sup>	Automated reciprocating device which bypasses or removes the instrument.

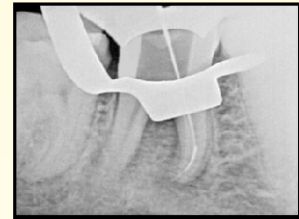
CASE HISTORY

CASE 2 A

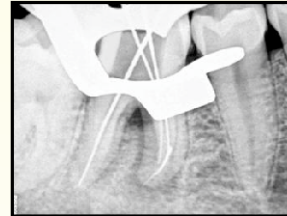
Name of the patient - pooja khare  
 Age – 28 yrs  
 Sex- female  
 Chief complaint- pain with lower right posterior region of jaw  
 Diagnosis- chronic apical periodontitis  
 Treatment plan-Instrument removal / Bypass followed by Re Root canal treatment with 46



Preoperative radiograph



Instrument bypass



Working length determination



Post obturation radiograph



1 month follow up radiograph



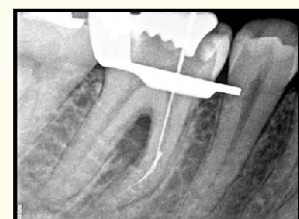
6 months follow up radiograph

CASE 2B

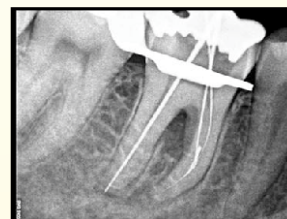
Name of the patient- Sankalp  
 Age – 28 yrs  
 Sex- male  
 Chief complaint- pain with lower right posterior region of jaw  
 Diagnosis- chronic apical periodontitis  
 Treatment plan-Instrument removal / Bypass followed by Re Root canal treatment with 46



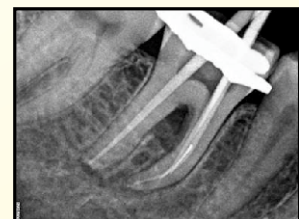
Preoperative radiograph



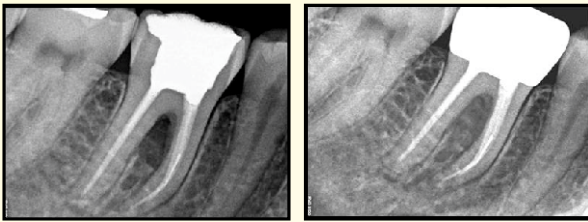
Instrument bypass



Working length determination



Master cone radiograph

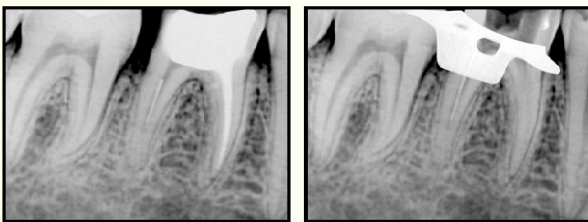


Post obturation radiograph 6 months follow up radiograph

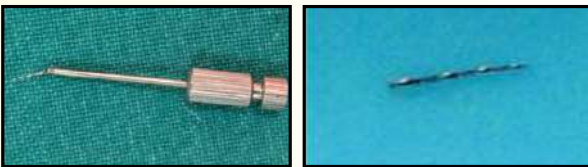
**CASE 2 C INSTRUMENT RETRIEVAL**

**CASE HISTORY**

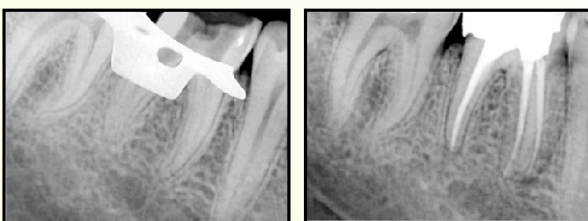
Name of the patient- mithila  
 Age – 24 yrs  
 Sex- female  
 Chief complaint- pain with lower right posterior region of jaw  
 Diagnosis- chronic apical periodontitis  
 Treatment plan- Re- Root canal treatment with instrument retrieval 46



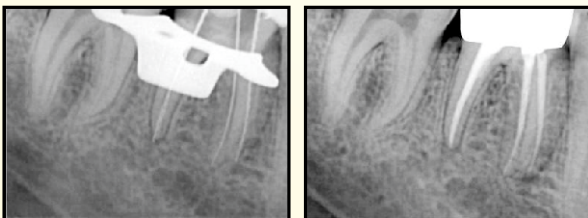
Preoperative radiograph After gutta-percha removal



Masseran kit Retrieved instrument



Instrument retrieval Working length determination



Post obturation radiograph 6 months follow up

**Case III -**

**Management of missed canals**

The aim of clinical study was to identify the incidence of additional or missed canal systems in molar retreatment cases in a private practice setting.

For the maxillary first molars, **93% of all missed canal were identified in the mesiobuccal root.**

In the mandibular second molars, **29% of missed canals were identified in the distal and 71% were identified in the mesial root.**

In the mandibular first molars, **86% of missed canals were identified in the distal and 14% were identified in the mesial root.**

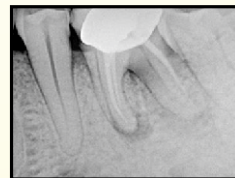
**David E. Witherspoon Missed Canal Systems are the Most Likely Basis for Endodontic Retreatment of Molars Texas Dental Journal February 2013**

**Methods to locate missed canals**

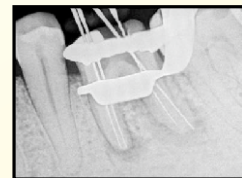
- Modifying the access cavity
- Radiographic techniques to assist locating the canals
  - Conventional radiography
  - Cone-beam computed tomography
- Ultrasonic devices
- Microscopes
- Transillumination
- Other methods-
  - 1% methylene blue dye
  - sodium hypochlorite champagne bubble test

**CASE HISTORY**

Name of the patient- manoj  
 Age – 32 yrs  
 Sex- male  
 Chief complaint- pain with lower left posterior region of jaw  
 Diagnosis- chronic apical periodontitis  
 Treatment plan- Re- Root canal treatment with 36



Preoperative radiograph



Working length determination



Postobturation radiograph



6 months follow up





# Retreatment due to obturation defects/failures

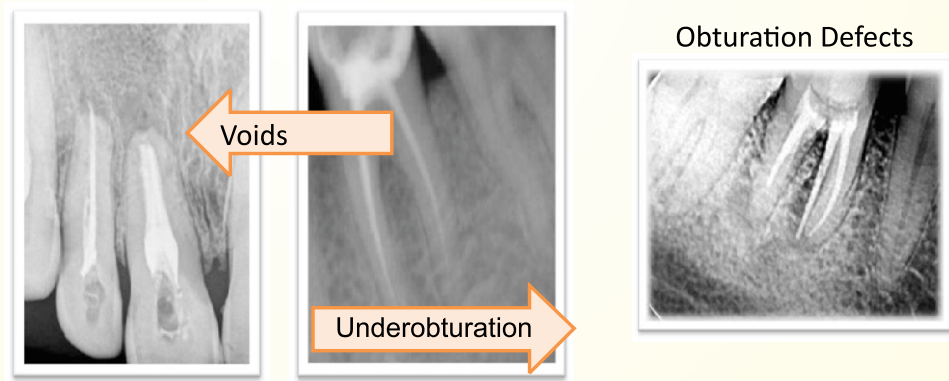
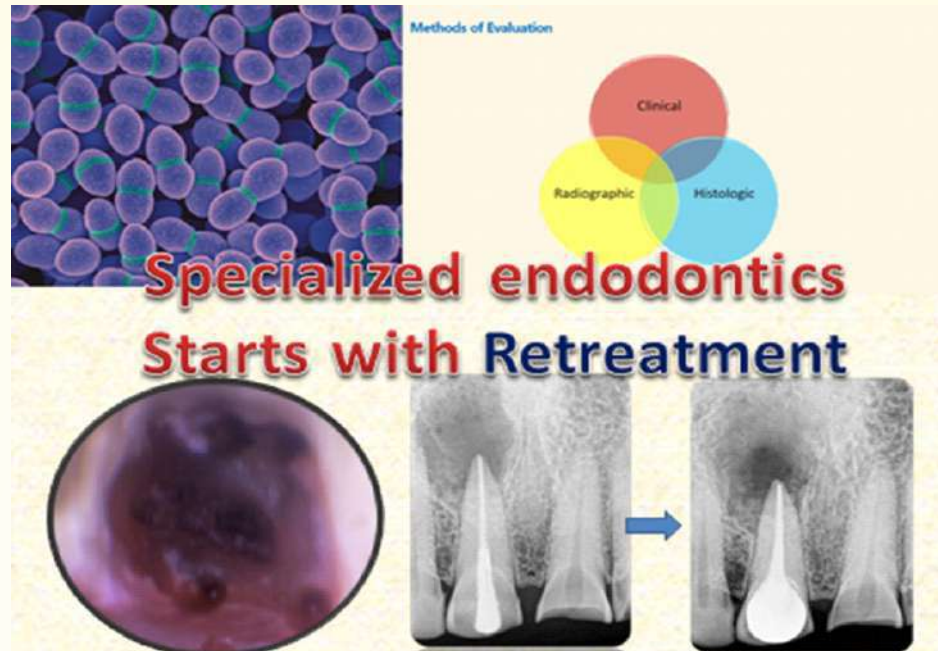
Dr. Deepti Sawatkar<sup>1</sup>, Dr.M.M.Warhadpande<sup>2</sup>

Post Graduate Student<sup>1</sup>,

Professor  
& Head of Department<sup>2</sup>

Department of  
Conservative Dentistry  
& Endodontics,

Government Dental  
College & Hospital,  
Nagpur



## **Case I :Inadequate obturation**

NAME: Abc

AGE/SEX: 23/F

CHIEF COMPLAINT: Pain with  
lower left back tooth region since 1  
month

ON CLINICAL EXAMINATION:

- Dislodged restoration with 34 & 35
- Pain On Percussion Positively

With 34 & 35

➤ H/O RCT 1 yr back  
ON RADIOGRAPHIC  
EXAMINATION:

- Internal Resorption with 34
- Inadequate Obturation with 34  
and 35



Preoperative IOPAR



After GP Removal



Working length IOPAR



Obturation done with MTA



Post obturation



6 months follow up

**Case II : Inadequate obturation**

NAME: Abc

AGE/SEX: 26/F

CHIEF COMPLAINT: Pain in lower right back tooth region since 2 months

ON CLINICAL EXAMINATION:

- Restoration seen with 47
- H/O RCT 6 months back
- Pain On percussion with 47

ON RADIOGRAPHIC EXAMINATION:

- Inadequate obturation 47



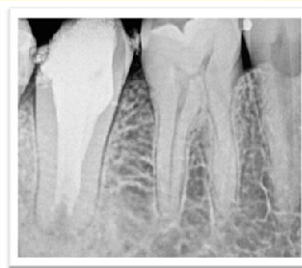
Preoperative IOPA



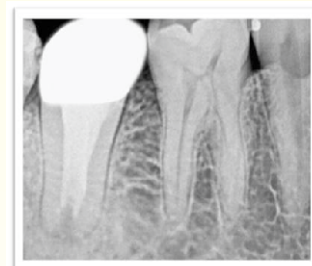
After GP removal



Working length



Post Obturation



6 months follow up

**Case III : Overobturation causing external root resorption**

NAME: Abc

AGE/SEX: 26/F

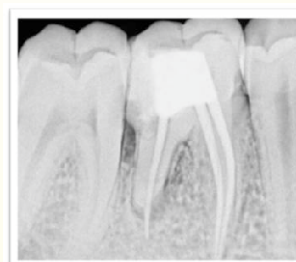
CHIEF COMPLAINT: Pain in lower right back tooth region since 2 months

ON CLINICAL EXAMINATION:

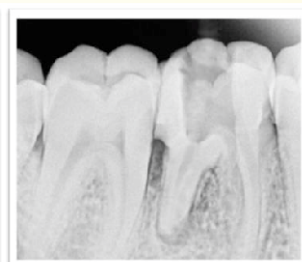
- Restoration seen with 47
- H/O RCT 6 months back
- Pain On percussion with 47

ON RADIOGRAPHIC EXAMINATION:

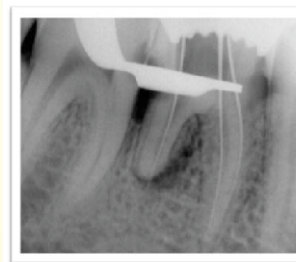
- Inadequate obturation 47



Preoperative IOPA



After GP removal



Working length



Post Obturation



6 months follow up

**Case IV : Nonsurgical management of large periapical lesion**

NAME: Abc

AGE/SEX: 32/F

CHIEF COMPLAINT:

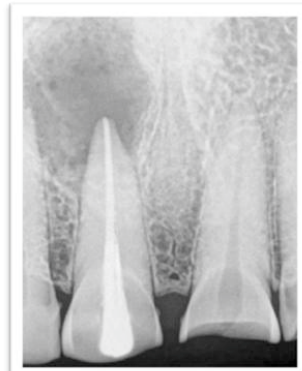
Pain and recurrent swelling with upper right front region of jaw since 6 months

ON CLINICAL EXAMINATION:

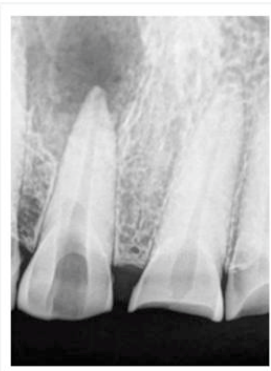
- Pain with 11
- Pus discharge with 11
- H/O RCT 4 years back

ON RADIOGRAPHIC EXAMINATION:

Large Periapical Radiolucency With 11



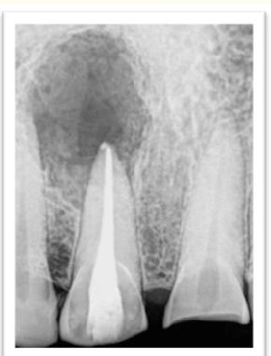
Preoperative IOPA



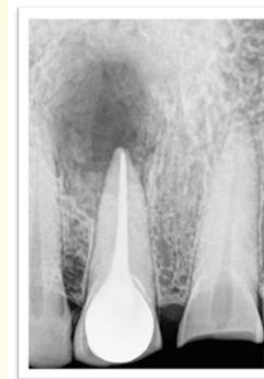
After GP removal



Working length



Post Obturation



6 months follow up



12 months follow up

**Case V : Non-surgical management of large periapical lesion**

NAME: Abc

AGE/SEX: 27/F

CHIEF COMPLAINT:

Pain and swelling with lower right back tooth region since 5 months

ON CLINICAL EXAMINATION:

- Swelling with 46
- Pain on percussion with 46
- H/O RCT 8 months back

ON RADIOGRAPHIC EXAMINATION:

- Periapical radiolucency with distal root with 46

Missed canal with 46 and inadequate obturation with 46



Preoperative IOPA



After GP removal



Working length



Post Obturation

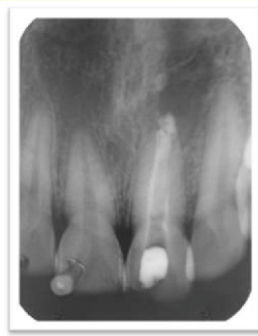


6 months follow up

**Some cases :**



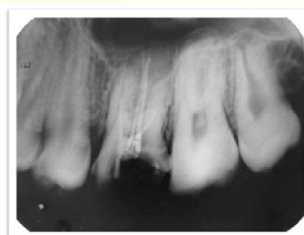
Preoperative IOPA



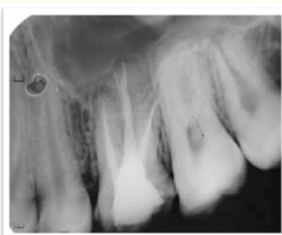
MTA Apical Plug



Obturation



Preoperative IOPAR



Postoperative IOPAR

**Table 2: Percentagewise distribution of Factors responsible for endodontic treatment failure.**


Factors for endodontic failure	Percentage(%)
Pain	34%
Underfilled obturation	31%
Missed canal	18%
Overfilling	12%
Fractured or Dislodged restoration.	5%

- “Factors Responsible for Root Canal Treatment Failure in the Permanent Dentition of the Patients Reported to Government Dental College and Hospital, Nagpur”

Complains	Percentage (%)
Toothache/Pain	66
Difficulty in Mastication	43
Swelling	24
Sinus tract/ Pus Discharge	12
Pain in adjacent soft tissue	5
Others	12

**Reasons for Failure**

Reasons	Percentages
>Underfilled obturation	60.6%
>Legde /Zipping	47.3%
>Instrument Separation	35.3%
>Fractured or dislodged restoration	30%
>Missed canal	25.3%
>Perforation	23.3%
>Recurrent Caries	20.6%
>Increased Size of Periapical lesion	18%
>Overfilled	12.6%
>Tooth Fracture	5.3%

  
**Knowledge, Attitude & Practice Of**  
**Dentist towards Repeat Root Canal Treatment :A Cross sectional study**  
 1) Miss Vaishnavi S. Shewatkar  
 2) Dr. Jyoti Wankhade  
 3) Dr. Marjusha Warhadpande

## CONCLUSION

- Non surgical root canal therapy has become a routine procedure in modern dentistry.
- Recent technical and scientific advances in Endodontics have resulted in the retention of millions of teeth that would otherwise be lost.
- The reasons for treatment failure can be multivalent.
- Correct diagnosis of failure is very important for deciding the retreatment option.
- Nonsurgical retreatment should be the first treatment choice, except when a canal cannot be completely negotiated because of an apical or coronal obstruction or a re-treatment attempt has already failed.
- The correct treatment choice can be made with the correct equipment available and the proper skills, adequate knowledge about armamentarium and experience.
- Technologic advancements in dentistry and specifically Endodontics have vastly improved the quality of care rendered to patients.
- These advancements allow clinicians to gain insight into the retreatment of failing root canals.
- Each case should be approached as a unique set of considerations that must be reviewed and interpreted prior to selecting a treatment method.
- Non surgical retreatment should be the preferred choice, since it seems to provide the most benefit with lowest risk.
- Non surgical treatment is usually less invasive than surgery and has a less traumatic postoperative course.
- Post treatment disease does not preclude saving the involved tooth.
- In fact, the vast majority of these teeth can be returned to health and long term function by current retreatment procedures.

In most instances, the retreatment option provides the greatest advantage to the patient, since there is no replacement that functions as well as a natural tooth.

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- Cohen AS, Brown DC: Orofacial pain and Emergencies: endodontic diagnosis and management. In Cohen S, Burns RC: pathways of pulp ed 8, St Louis, 2002, Mosby, p 31
- American Association of Endodontics: Guide to Clinical endodontics, Chicago, 2004, American Association of Endodontics.

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