



## Hope for the Hopeless- A Multidisciplinary (Perio-Endo-Prosthodontic) Management of Teeth- A Case Report

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

### **Article Information**

#### Editor(s):

(1) Armando Montesinos Flores, National Autonomous University of Mexico, Mexico.

#### Reviewers:

(1) Jayakumary Muttappallymyalil, Gulf Medical University, United Arab Emirates.

(2) Shavi Garg, SGT University, India.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/70441>

Case Study

**Received 24 April 2021**

**Accepted 29 June 2021**

**Published 01 July 2021**

### **ABSTRACT**

**Introduction:** Preservation of natural dentition is the primary goal of dentistry. Patients, today, not only value their teeth, but also express a desire to save their natural dentition in favour of extraction whenever possible. Hemisection is one of the alternative conservative treatment which aims to preserve the remaining healthy tooth structure and prevent numerous undesirable sequel. Apicoectomy and bone grafting are the stepping stones to achieve that goal.

**Aim:** To re-create healthy functional periodontium.

**Methodology:** A 54-year old patient got vertical fracture of tooth #36 involving the half of the mesial root. Simultaneously he had peri-apical lesion in tooth #35 along with Class II gingival recession and Grade III mobility #35, #36.

So it was decided to perform root canal treatment #35, #36 and to resect the fractured mesial root of #36, followed by placement of bone graft in the extraction socket. Apicoectomy was performed in #35. Surgical area was allowed to heal by minimizing the forces on the root for 8 weeks. After healing of the tissues, fixed bridge involving retained distal half of mandibular molar, second and first premolar with pontic is planned.

**Results:** Uneventful healing was seen in terms of periodontal consideration. Mobility of teeth #35 and distal half of #36 were reduced after 4weeks. 6 months later, crown & bridge was placed.

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**Conclusion:** This case highlights the interdisciplinary approach of molar hemisection, apicoectomy, bone regeneration with prosthetic rehabilitation as an innovative approach providing better results with minimum patient apprehension and long term stability.

*Keywords: Hemisection; apicoectomy; regeneration; bone grafts.*

## 1. INTRODUCTION

Periodontitis, a chronic multifactorial inflammatory disease associated with a dysbiotic plaque biofilm and characterized by progressive destruction of the tooth supporting apparatus [1]. An epidemiological survey has suggested that more than half of all adults are affected by periodontal disease to varying degrees [2–4], and a remarkable surge (25.4% increase) in the prevalence rates of periodontal disease was observed from 2005 to 2015 [2]. Periodontitis can consistently disrupt tooth investing tissues and lead to tooth loss if left untreated [3]. Modern day periodontics aims at maintaining the health of teeth and their supporting structures with the main goal of controlling the infection and regenerating the lost supporting structures by means of either mechanical recontouring or by grafting techniques such as barrier membranes, bone replacement grafts, growth factors, tissue engineering or by various combination of these above materials [4]. The basic dogma of tissue regeneration is to stimulate a cascade of healing events which, if coordinated, can result in the completion of integrated tissue formation and may prove to be a huge step-up in managing advanced periodontal disease and preventing tooth loss [5]. Hemisection and apicoectomy are various conservative treatment approaches which are performed to save the natural dentition [6]. Apicoectomy is the removal of 3–4 mm of the root end is common place and is usually required to eliminate anatomical irregularities and contaminated (biofilms, bacteria, and endotoxins) radicular hard tissues. This is done with a high-speed rotating bur and coolant, minimizing heat generation and preventing the development of root fractures [7].

## 2. CASE REPORT

A 54-year old male patient reported to the Department of Periodontology, Kothiwal Dental College and Research Centre 1 year back with difficulty in chewing food and feeling of a cracked tooth in his left mandibular posterior teeth region since last 3 months and gave a history of tobacco chewing since last 30 years. There was no relevant medical or dental history reported by

the patient. There were no contributory family and habit history. Periodontal examination revealed good oral hygiene with minimal plaque and calculus deposits.

On extra-oral examination, the face appeared bilaterally symmetrical, with competent lips and the lymph nodes were not palpable.

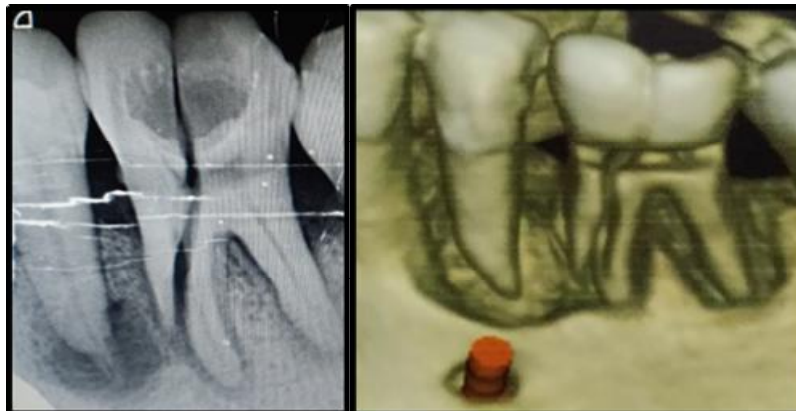
On intra-oral examination revealed a clinically healthy gingiva with recession #34- #36 Class I, Cairo F et al., [8]. Tooth status revealed abfraction with vertical crown root fracture #36 and both #35, #36 were non-vital (Fig. 1).



**Fig. 1. Intra-oral status of the patient**

Both intra-oral peri-apical radiograph (IOPAR) and CBCT (Fig. 2) revealed obliteration of buccal cortical plate #35, #36, vertical crown root fracture #36, close proximity of mental nerve (2.5 mm apical) with root apex #35, Periapical radiolucency with external root resorption #35.

The haematological investigation revealed that all the blood parameters were within the normal range. After complete clinical, radiological and haematological investigations and analysis the diagnosis was made as- Endo- Perio lesion with vertical fracture #36, Perio-Endo lesion with inflammatory external root resorption #35, Gingival recession #34, #35, #36.

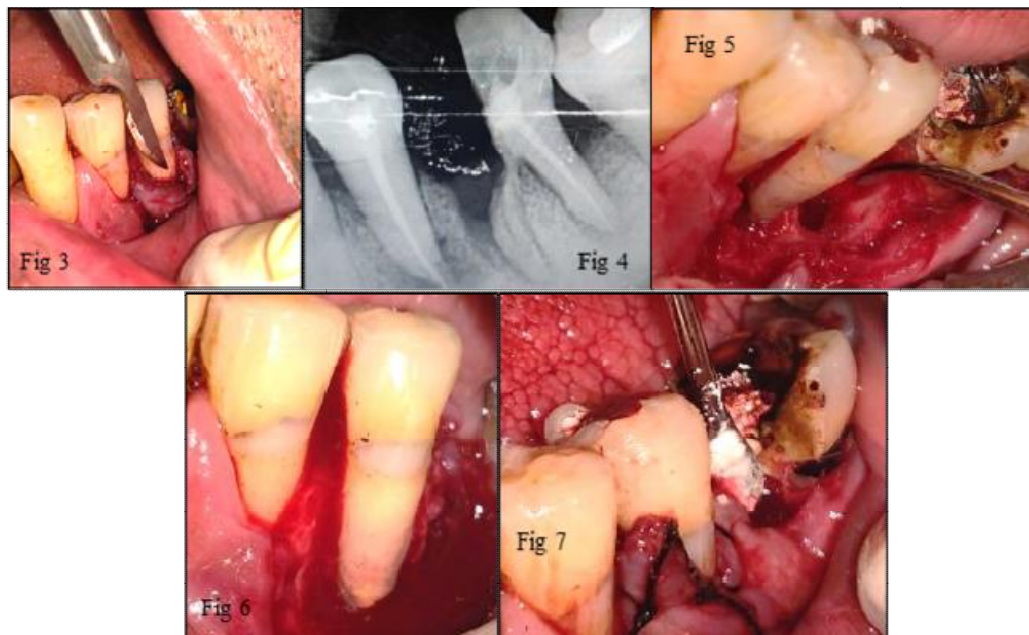


**Fig. 2. Radiographical evaluation**

### 2.1 Treatment Procedure

Informed consent was taken from the patient and after a successful phase I therapy comprising of thorough scaling and root planing, root canal treatment was done w.r.t #35 and distal root of #36. The surgical part comprised of- after achieving full anesthesia, crevicular incision followed by a releasing incision was given from distal of #34 to distal of #37 and a full thickness muco-periosteal flap was reflected (Fig. 3). The fractured tooth segment was then removed (Fig. 4) and the remaining of the mesial root of #36 which was embedded within the bone was removed with a cryer (Fig. 5). Apicoectomy was

performed where the apical 3mm of the root structure was removed #35 and the apex was sealed with a heated ball burnisher (Fig. 6). All the granulation tissues were removed and the root surfaces were thoroughly planed. Alloplastic bone graft (Hydroxyapatite) was packed #35 & mesial root socket #36 (Fig. 7) and the flap was coronally pulled and sutures were placed. Following surgery, the surgical site was covered with Periodontal Pak (Coe-Pak™, GC America INC., ALSIP, IL 60803 U.S.A). Post-surgery, mechanical oral hygiene maintenance was avoided for 1 week at the surgical site. Oral hygiene was maintained by using 0.2% Chlorhexidine mouthwash.



**Figs. 3-7. Treatment procedure performed**

Figs. 8, 9 and 10 depicts immediate, 1 month and 3 months post-operative radiological status of the surgical site. It was seen after 6 months that there was reduced mobility, bone formation and gradual elimination of the peri-apical pathology and thereafter prosthesis was placed from #34- #37 (Fig. 11).

### 3. DISCUSSION

The present clinical report demonstrates a conservative treatment approach to an endo-

perio problem by hemisection and a perio-endo problem by apicoectomy followed by prosthetic rehabilitation. Hemisection, an alternative conservative treatment which aims to preserve the remaining healthy tooth structure and prevent numerous undesirable sequelae including alveolar bone loss, tooth drifting, vertical dimension collapse, supra-eruption of opposing teeth and a decrease in chewing efficiency and if it is performed well, it not only satisfies the patients psychology and fear of extraction of teeth but also preserves the remaining alveolar



**Figs. 8-10. Post-operative radiological status**



**Fig. 11. After placement of prosthesis**

bone, as alveolar bone is a tooth dependant structure. It also maintains the proprioception of the periodontal ligament which is utmost required for maintaining a healthy stomatognathic system [9].

But before performing these procedures, case selection has to be done correctly and the restoration is of an acceptable design relative to the occlusal and periodontal needs of the patient as it was done in this case. Careful case selection and a proper treatment planning are influenced by many factors including tooth factors, strategic importance of the tooth, bone quality, soft tissue quality and quantity, accessibility to the area of operation, periodontal status around the remaining root, systemic status of the patient, clinician's expertise and most importantly the self-motivation and maintenance by the patient [10]. Along with the surgical procedures, prosthesis also plays an important role in the success of the treatment. Cuspal inclination was minimized and all sort of lateral occlusive forces was removed to minimize any chances of traumatic occlusion [11]. Currently, with the advent of new regenerative materials and techniques regeneration of the lost periodontal structures have become much more easy and predictable [12].

#### 4. CONCLUSION

Treatment decision should consider a risk to benefit ratio for every case selection. Ultimately, priority is to save the natural teeth whenever indicated. Hemisection as an alternative conservative treatment option to extraction, especially for teeth with advanced endo-perio lesions. The remaining tooth that a Periodontist can save is not taking away anything rather is a contribution to occlusion and preservation of periodontium.

#### CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

#### ETHICAL APPROVAL

It is not applicable.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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*Peer-review history:*  
*The peer review history for this paper can be accessed here:*  
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