

## Case Report

### Exploring Hemisection- A Case Report

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#### ABSTRACT

The furcation area, because of varied nature and pattern of periodontal destruction creates situations in which routine periodontal procedures are somewhat limited and special procedures are generally required. Hemi-section of the affected tooth helps preserve the tooth structure, alveolar bone and promote cost savings over other treatment options. This case report describes a simple procedure for hemisection in mandibular molar by vertical cut method and its subsequent restoration.

**Key words:** Furcation, Mandibular molar, Hemi-section.

#### INTRODUCTION

Progressive inflammatory disease of periodontium in molar region may cause attachment loss, sufficient enough to affect the bifurcation or trifurcation of these teeth. Although bacterial plaque is the primary etiologic factor in the development of furcation defects, local anatomical

factors may affect the rate of plaque deposition or complicate the routine performance of oral hygiene procedures. The diagnosis and management of mandibular teeth exhibiting furcation involvement always had been a challenge, especially when the furcation involvement has progressed to a Grade III furcation. Grade III furcation can be effectively treated by hemi-section or bicuspidization and root resection. Hemisection is most commonly done in mandibular molars. After removal or separation of root with its accompanying crown portion, the remaining tooth portion is restored with fixed prosthesis.<sup>[1]</sup>

#### CASE REPORT

A 30 years old male reported in the Department of Periodontics, with the chief complaint of pain and mobility of left mandibular first molar. On examination, the tooth was sensitive to percussion

and revealed grade-I mobility. A probing depth of 10 mm with pus discharge was found around the distal root of 36. On radiographic examination, severe vertical bone loss was evident surrounding the distal root and involving the furcation area. The alveolar bone support of mesial root appeared to be adequate. After clinical and radiographic examination the case was diagnosed as periodontal abscess with grade III furcation involvement in relation to 36.

### **Surgical procedure**

Phase-I therapy (non-surgical phase) was done and oral hygiene maintenance instructions were given. After phase-I therapy, endodontic therapy was completed.[1] Patient was reviewed after fifteen days, patient was maintaining excellent oral hygiene. On the day of surgery informed patient consent was been taken. Patient preparation was done with disinfection of extra

oral and intraoral site and rinsing the patient mouth with 0.2% chlorhexidine mouth wash for 2 minutes. Under local anaesthesia full thickness flap was reflected from first premolar to second molar. After reflection of the flap all granulation tissue was removed. A long shank tapered fissure carbide bur was used to make vertical cut toward the bifurcation area. A probe was passed through the cut to ensure the separation. The distal half was extracted and socket was irrigated adequately with sterile saline. The extraction site was irrigated and debrided. The flap was repositioned and sutured with 3/0 black silk sutures. Surgical site was covered with Coe-pack dressing. The occlusal table was minimized to redirect the forces along the long axis of the mesial root. Post-operative analgesics and antibiotics were prescribed. After 3 months of healing of the tissues, three unit fixed partial denture was given.



Fig.1 Pre-op clinical view showing 10mm of pocket depth



Fig. 2 Pre -op radiograph showing bone loss in relation to distal root and furcation



Fig. 3 Intraoperative view



Fig.4 After surgical resection



Fig. 5 Resected distal half of tooth



Fig. 6 Fixed partial denture after complete healing



Fig. 7 Post-operative IOPA

## DISCUSSION

Hemisection is the splitting of a two-rooted tooth into two separate portions. This process has been called bi-cuspidization or separation.<sup>[2]</sup> The terms “root amputation” and “hemi-section” are known collectively as “root resection”. It is useful alternative procedure to save those multirouted teeth which have been indicated for extraction. According to Newell *et al*, the advantage of the amputation, hemisection or bisection is the retention of some or the entire tooth.<sup>[3]</sup> However the disadvantage is that the remaining root or roots must undergo endodontic therapy and the crown must undergo restorative management. Before selecting a tooth for hemisection patient's oral hygiene index, caries index and medical status should be considered. The key for successful treatment is proper diagnosis of the furcation defects, and identification of local and anatomic factors. Park *J et al*<sup>[4]</sup> enumerates few factors which help in successful treatment planning and it's execution, these factors are: tooth anatomy, crown root ratio, severity of attachment loss, inter-arch and intra-arch occlusal relationship, root trunk length, root morphology, cervical enamel projections, health of a patient, costs and time factor, diagnostic and treatment planning and skills. Gianfranco Carnevale *et al*<sup>[5]</sup> also advised to consider some factors before root resection and root separation like: Root trunk length, root divergence, fusion between root cones, support and stability of remaining root. Buhler stated that hemisection should be considered before every molar extraction, because it provides a good, absolute and biological cost saving alternative with good long term success.<sup>[6]</sup> Carnevale *et al* in a 10-year

prospective controlled clinical trial, demonstrated a 93% survival rate of root resected furcation-involved tooth and a 99% survival rate of non-furcation-involved teeth.<sup>[7]</sup> Different treatment options are available for patient with different degree of furcation involvement like regeneration therapy, tunnel preparation etc.<sup>[8]</sup>

For this patient since there is Grade III involvement regenerative procedures were not possible. Implant therapy was considered but not chosen because of the economic factor. Instead Hemisection followed by a 3-unit fixed partial denture was selected as a final treatment. The distal root was resected because of the severity of infection and predictable poor prognosis of distal root half. The success of the tooth with hemisection depends on the supporting bone, the restorative treatment plan, and the oral hygiene maintenance by the patient.<sup>[9]</sup> Regular periodontal maintenance and sufficient coronal restoration of the root resected teeth are important precondition for long term survival.<sup>[10]</sup>

## CONCLUSION

Hemisection may be a suitable alternative to extraction and implant therapy and should be discussed with patients during consideration of treatment options. The prognosis for hemisection procedure depends on the proper case selection, adequate endodontic procedure & acceptable design of restoration. With new advances in diagnosis and treatment in the field of dentistry, teeth with hopeless prognosis can be saved and maintained with the help of interdisciplinary approach.

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