



**Case Report**

**Management of endodontically challenged and periodontally compromised tooth- a restorative approach**

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**ABSTRACT**

Long term retention of mandibular molars with Grade III furcation is a challenging clinical scenario but with an interdisciplinary approach of Periodontics, Endodontics and Prosthodontics promising results can be achieved. Bicuspidization is a surgical procedure performed to separate the mesial and distal roots of molars with its crown portion, where both segments are then retained individually. This procedure will maintain the dentition with a hopeless periodontal prognosis. While considering treatment options, Bicuspidization may be a suitable alternative to extraction and implant and should be discussed with patients priorly.

**Keywords:** Bicuspidization, Furcation, Obturation, Curettage, Crowns.

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## Introduction

Advancements in dental science and patient higher expectations, have led to a more conservative treatment approach to save teeth when periodontal disease affects the furcation area. Tunneling treatments, hemi section and Bicuspidization, as well as open flap debridement, are used to treat abnormalities in mandibular molars. Bicuspidization is a surgical procedure carried out exclusively on the mandibular molars, where the mesial and distal roots are separated with their respective crown portion. This separation eliminates the existence of a furcation and facilitates an effective oral hygiene practice<sup>[1]</sup>.

This technique helps in maintaining the dentition even with poor periodontal prognosis. The success factors of Bicuspidization were in accordance with the condition of the tooth and its supporting tissue.

The present case report describes a conservative technique for periodontally compromised and badly mutilated tooth.

## Case Report

A 40 year old female patient came to our dental office with the chief complaint of pain in left lower back tooth region since 3 weeks. On examination 36 revealed a fractured restoration (Fig.1) and Patient gave a history of an incomplete root canal treatment which was initiated 6 months back. On probing the area, there was 7mm deep periodontal pocket in the buccal aspect around the furcation area (Fig.1). The intra oral periapical radiographs (IOPA) confirmed Class III furcation involvement (Glickman's classification) with evident bone loss in the furcation area (Fig.2). The mesial and distal roots had sufficient bone support.

## Treatment plan

### **Phase 1: Continuation of Root canal treatment in 36 followed by Post and core.**

Accordingly access cavity was modified and the working length was determined and the canals were biomechanically prepared using Protaper rotary files till F2. Intra canal medicament was placed (Fig 2) and reviewed after 4 weeks. Single cone Obturation was done in both mesial and the distal canal (Fig 3). Post space preparation was done Mesio buccal and distal canals and Fiber posts were luted using Dual cure resin cement (Fig 4). Under proper matricing, Bulk fill Composite resin was used for core build up (Fig 5).

### **Phase 2: Bicuspidization, Curettage and restoration of tooth with PFM crowns.**

Under local anesthesia, vertical cut method was used to separate the crown of 36. A long shank straight fissure diamond bur was used to make vertical cut towards the bifurcation area. Single molar is now separated into two crowns (Fig 6) and the crown preparation was also completed (Fig 7). The furcation area was trimmed, so that no residual debris was present that could cause further periodontal irritation. As a conservative management, Curettage of the furcation area was done (Fig 8) without raising the flap since interdental area became accessible on separation. Systemic antibiotics and analgesics were prescribed and post operative instructions were given.

After 10 days patient was recalled and review was done. Subsequently Proximal and occlusal restoration was done in 37. Impression of prepared crowns in 36 was recorded and temporization done. After one week, two separate PFM crowns were cemented on mesial and distal half of the tooth (Fig 9).

Patient was asked to report after 6 months for review.

## **Discussion**

The mandibular molars are first teeth to erupt in oral cavity and therefore are having high caries susceptibility index, which actually necessitates cautious implementations of oral hygiene measures. Any deprivation in the maintenance may lead to serious problem like furcation involvement <sup>[2]</sup>.

Diagnosis and treatment of furcation involvement is a challenge. Management of molars with furcation involvement represents one of the major problems in clinical periodontology. Both prognosis and choice of therapy depend on the degree of furcation involvement. Root surfaces facing the furcation area of mandibular molars are concave, resulting in a wider Mesiodistal osseous chamber than either the buccal or lingual furcation opening <sup>[6]</sup>.

Farshchian and Kaiser were the first to depict the successful implementation of Bicuspidization or molar bisection procedures in the management of severe furcation involvements. They stated that the success of Bicuspidization depends on three factors: 1. Stability of, and adequate bone support for, the individual tooth sections 2. Absence of severe root fluting of the distal aspect of the mesial root or mesial aspect of the distal root 3. Adequate separation of the mesial and distal roots, to enable the creation of an acceptable embrasure for effective oral hygiene <sup>[3]</sup>.

The clinician splits the mandibular molar vertically through the furcation, without removing either half, leaving two separate roots that then are treated as bicuspid. The prognosis for Bicuspidization is the same as for routine endodontic procedures provided that case selection has been performed correctly and the restoration is of an acceptable design relative to the occlusal and periodontal needs of the patient as it was in this case. However, there are few disadvantages associated with Bicuspidization. As with any surgical procedure, it can cause pain and anxiety. An endodontic therapy failure can also cause the failure of this procedure if the tooth is not relieved from lateral excursive forces or proper marginal adaptation is not there, the restoration may lead to periodontal destruction <sup>[4,5]</sup>.

## **Conclusion**

The prognosis of the tooth with Bicuspidization depends on the supporting bone, the restorative treatment plan, and the oral hygiene of the patient. With improvement in the dental procedures and materials in both Periodontics and Endodontics leading to more sophisticated therapy, teeth at marginal prognosis has provided the opportunity for patients to maintain a functional dentition for life time.

## **Authors' contribution**

Rajasekaran Meenakshisundaram: Root canal procedure

Ramya Arun, Swarna Alamelu: Bicuspidization, curetteage, restoration of tooth, Data Analysis, manuscript drafting

Deepavalli A, Shreemogana – Literature search, Manuscript writing

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## **Conflict of interest**

The authors have nothing to disclose or any conflicts of interest.

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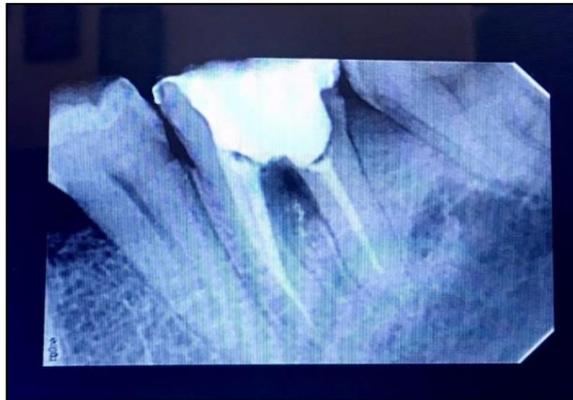
## Figures



**Figure 1.** Fractured restoration with 36



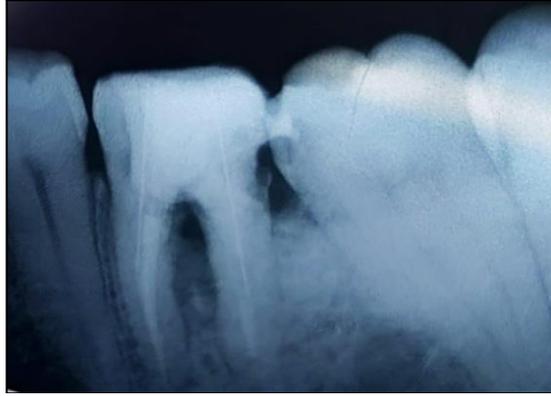
**Figure 2.** Class III furcation involvement (Glickman's classification) with evident bone loss in the furcation area



**Figure 3.** Single cone Obturation in both mesial and the distal canal



**Figure 4.** Fiber posts luted using Dual cure resin cement



**Figure 5.** Core build up with Bulk fill Composite resin



**Figure 6.** Single molar is separated into two crowns



**Figure 7.** Crown preparation



**Figure 8.** Curettage of the furcation area



**Figure 9.** After one week, two Cemented PFM crowns on mesial and distal half of the tooth



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