



### Case Report

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## Split and Salvage- A case of vertically fractured mandibular molar

Kunnel Apoorva<sup>1</sup>, Chigurupati Swetha<sup>2</sup>, Surya Prasanna Jammula<sup>3</sup>, Umrana Faizuddin<sup>4</sup>

<sup>1</sup> Post Graduate Student, Department of Periodontics, Panineeya Mahavidyalaya Institute of Dental Sciences, Hyderabad-500060, Telangana, India

<sup>2</sup> Post Graduate Student, Department of Conservative Dentistry and Endodontics, Panineeya Mahavidyalaya Institute of Dental Sciences, Hyderabad-500060, Telangana, India

<sup>3</sup> Professor, Department of Periodontics, Panineeya Mahavidyalaya Institute of Dental Sciences, Hyderabad-500060, Telangana, India

<sup>4</sup> Professor, Department of Conservative Dentistry and Endodontics, Panineeya Mahavidyalaya Institute of Dental Sciences, Hyderabad-500060, Telangana, India

### Abstract

Endodontically treated teeth which are left unrestored prosthetically are more susceptible to fractures. Such teeth are usually given a poor prognosis and indicated for extraction. But in conditions where the tooth is periodontally sound, various resective procedures are attempted at saving the tooth and retaining it. Bicuspidization is one such procedure which essentially bisects the tooth into 2 parts. In the present case, a molar with a vertical fracture line involving the furcation was managed by bicuspidization and subsequently rehabilitated.

**Keywords:** Vertical Fracture, Mandibular Molar, Bicuspidization.

### INTRODUCTION

Vertical tooth fractures can develop with or without prosthetic rehabilitation in endodontically treated teeth. These fractures cause inflammation in the furcation region and reduce prognosis of the involved tooth. Usually extraction may be indicated for such teeth associated with periodontal disease. But in cases where there is intact inter-dental bone, resective procedures such as bicuspidization aim to manage and retain the teeth in the dental arch.

Bicuspidization is a resective surgical procedure where a single molar is split into two halves through the crown and root and then restored as two individual teeth. This is especially indicated when there is bone loss involving the inter-radicular furcation area with intact mesial and distal bone.

The aim of the present case was to treat a mandibular molar with an incomplete vertical root fracture by means of bicuspidization.

### CASE REPORT

A 27-year old female patient was referred from the Department of Endodontics with the chief complaint of pain and swelling in the lower left back tooth region. The patient gave a history of root canal treatment about a year ago for which she had failed to get a prosthesis. On clinical examination, a sessile swelling in the mid-buccal region of the marginal gingiva was noticed with no mobility or recession of 36 (Figure 1). A 6-mm pocket was noted in the mid-buccal region and the tooth was also tender on percussion. On radiographic examination, a fracture line involving the furcation region was seen. Bony support was intact and adequate around both the roots.

The patient was advised prophylactic antibiotics and analgesics. Amoxicillin 500 mg was prescribed 3 times a day and Aceclofenac was given twice daily for 3 days. A hemogram was advised and after establishing they were in normal limits, a treatment plan was formulated to perform bicuspidization on the tooth followed by rehabilitation.

Under local anesthesia, a crevicular incision was given from the distal aspect of 35 to the mesial aspect

### \*Corresponding author:

Dr. Kunnel Apoorva

Post Graduate Student,  
Department of Periodontics,  
Panineeya Mahavidyalaya  
Institute of Dental Sciences,  
Hyderabad-500060, Telangana,  
India

Email:

apoorvakunnel@gmail.com

of 37 and a full-thickness flap was elevated buccally and lingually. A straight fissure bur was used to make a cut extending through the furcation. The tooth was separated into 2 halves (Figure 2). Any residual restoration and sharp prominences were smoothed out. Occlusal reduction was done to prevent unnecessary load on the individual roots. Pre-operative and post-operative radiographs were taken to confirm the complete separation of the tooth (Figure 3). A periodontal dressing was given.

Patient was recalled after 10 days for crown preparation. Individual all metal crowns were given on the mesial and distal half (Figure 4). The patient reported with no complaints at 1 month follow-up.



Figure 1: Pre operative clinical view



Figure 2: Bicuspidization of the tooth



Figure 3: Pre and post-operative RVG



Figure 4: Prosthesis irt 36

## DISCUSSION

The mandibular molars are the pioneer teeth to erupt into the oral cavity. They play a key role in the development of occlusion and the arch form. Early loss due to any reason can lead to a disharmony in the occlusion, arch shortening, tilting of the adjacent teeth etc. So, various therapeutic measures come into play to ensure maintenance of these teeth. The treatment protocol may involve a combination of periodontic, restorative and endodontic so that the teeth maybe retained in whole or a part of it.

Root resective procedures are one such kind which aim to conserve as much tooth structure as possible without extraction. Bicuspidization is one of them which essentially divides a tooth into 2 parts and makes it feasible for maintenance.

Farschian and Kaiser <sup>[1]</sup> stated that the success of this procedure depends on:

- Stability and adequate bone around individual roots.
- Absence of severe root fluting.
- Adequate separation of the roots, so that an acceptable embrasure can be created for maintenance of oral hygiene.

Arabaci T *et al* in 2012 <sup>[2]</sup> saved an iatrogenically perforated mandibular molar with Grade II furcation and Grade I mobility by splitting the tooth and subsequent rehabilitation. Mantri V *et al* in 2013 <sup>[3]</sup> shared 3 cases where the involved molars were treated by various resective procedures like hemisection and bicuspidization. They stated that the success is satisfactory as long as proper maintenance and follow up is performed. Ratnaditya A *et al* 2015 <sup>[4]</sup> treated an 11 year old with a periodontally involved deeply carious mandibular molar. The tooth was cut into two halves and later restored using semi-permanent stainless steel crowns. Abu Hussein M *et al* in 2015 <sup>[5]</sup> reported the successful outcome of a Grade III furcation involved mandibular molar by bicuspidization. The patient was followed up till 24 months and radiographic evaluation showed no further bone loss.

Ramesh A *et al* in 2015 <sup>[6]</sup> shared a case on salvaging a mandibular molar with Class III furcation involvement and bone loss until apical third of root using bicuspidization. At the end of 18 months, the tooth was healthy with no functional or biological complications. Noorudeen AM *et al* in 2015 <sup>[7]</sup> conservatively treated a molar by cutting it into 2 halves and rehabilitating them as individual parts. The case was followed up every 6 months for a period of 2 years and showed no further complication. Sharma A *et al* in 2016 <sup>[8]</sup> managed a molar with furcation bone loss in a 24 year old patient with endodontic treatment followed by splitting the tooth. At 1 month follow-up, healing was satisfactory and the 2 separated sections were restored with Porcelain Fused to Metal (PFM) crowns. Anup V *et al* in 2016 <sup>[9]</sup> treated a molar with furcation involvement and insufficient crown length by bicuspidization followed by glass fibre post and core build-up. Temporary acrylic crowns were given which were later replaced by porcelain veneered double metal crowns.

Sachdeva S *et al* in 2017 <sup>[10]</sup> treated a lower molar with bone loss involving the mesial root and inter radicular area. The tooth was bisected and the area grafted using bone graft and covered by Platelet Rich Fibrin (PRF) membrane. The tooth was restored using stainless steel crowns and remained without any complications at the end of 24 months. Gufran K *et al* 2018 <sup>[11]</sup> managed furcal perforation of right mandibular left molar by halving the tooth followed by bone grafting. PFM crowns were given at 6 weeks and the patient was followed up till 6 months. Kumar R *et al* in 2019 <sup>[12]</sup> saved a molar with bone loss in the furcation region by splitting the tooth into individual bicuspid. Metal crowns were given and proper plaque control was advised. Nidyasari F

*et al* in 2021<sup>[13]</sup> treated a chronic peri-apical abscess in a molar with secondary periodontal involvement by means of bisection. This is considered as suitable alternative treatment to extraction for multi-rooted teeth with Class II furcation involvement. Sandjoko MT *et al* in 2021<sup>[14]</sup> managed a necrotic mandibular second molar with subsequent periodontal infection. The tooth was split into mesial and distal halves and rehabilitated using fiber posts and PFM crowns. In the present case, the tooth had a vertical fracture line involving the furcation area and naturally bisecting the tooth. As there was intact mesial and distal bone on either side, a decision was made to split the tooth and retain it in the dentition by prosthetically rehabilitating it.

## CONCLUSION

Bicuspidization of a vertically fractured tooth helps to retain periodontally healthy teeth in dentition and prevents unnecessary extraction procedures. The future of treatment lies in an effective multi-disciplinary approach which emphasizes on saving what is present and minimizing the removal of tooth.

## Conflict of interest

The authors declare that there is no conflict of interest.

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