

# Premolarisation of Mandibular Molar - “Two are better than One”: - A Case Report

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### **Abstract**

Bicuspidisation or Premolarisation is a surgical technique of sectioning the mandibular molar roots with their respective crown portions followed by rehabilitation with fixed prosthesis in the individual segments. This not only eliminates the furcation involvement but also facilitates effective oral hygiene maintenance. The present case report demonstrates the successful management of left mandibular first molar with furcation involved by endodontic treatment and bicuspidisation followed with subsequent prosthodontic rehabilitation. It gives a better alternative to salvage a periodontally compromised tooth rather than opting for extraction.

**Keywords:** Bicuspidisation; furcation defects; hemisection; mandibular molar.

## INTRODUCTION

The treatment and long-term retention of mandibular molar teeth involving furcation has always been challenging to clinician. The treatment may involve combining Restorative dentistry, Endodontic and Periodontics, so that the teeth are retained in whole or in part. [1]

The furcation is an area of anatomic morphology that may be difficult or impossible to debride by routine instrumentation. [2,3] Routine home care methods might not keep the furcation area free of plaque. [4]

The progress of inflammatory periodontal disease, if untreated, results in attachment loss sufficient enough to affect the furcation of the multi-rooted teeth. Thus, tooth resection procedures are used to preserve as much tooth structure rather than sacrificing the whole tooth. [5]

The term root resection signifies the excision and removal of any segment of the tooth or a root with or without its accompanying crown portion. Various resection procedures described are: root amputation, hemi-section, and bisection/bicuspidation.[6]

Bicuspidization is a surgical procedure carried out on the mandibular molars. It can be defined as the process of splitting of a two rooted tooth into two separate portions. The procedure is most likely to be performed on mandibular molars with buccal and lingual class II and class III furcation involvements and converting them into two premolars. Diagnosing furcation defects is of paramount importance to execute an effective treatment strategy. In Grade III furcation, the Nabers probe passes through and through the furcation from the buccal to the lingual side, but the furcation is not clinically visible. Endodontic therapy is performed initially, and during the open flap debridement procedure, the bicuspidation is done. The tooth is restored with a post endodontic restoration, keeping in mind that the restoration allows for optimal plaque control in the space between the separated roots.[7]

Weine [8] listed the following indications for tooth resection.

#### **Periodontal indications**

- Severe vertical bone loss involving only one root of multi-rooted teeth.
- Through and through furcation destruction.

- Unfavorable proximity of roots of adjacent teeth, preventing adequate hygiene maintenance in proximal areas.
- Severe root exposure due to dehiscence.

#### **Endodontic and Restorative indications**

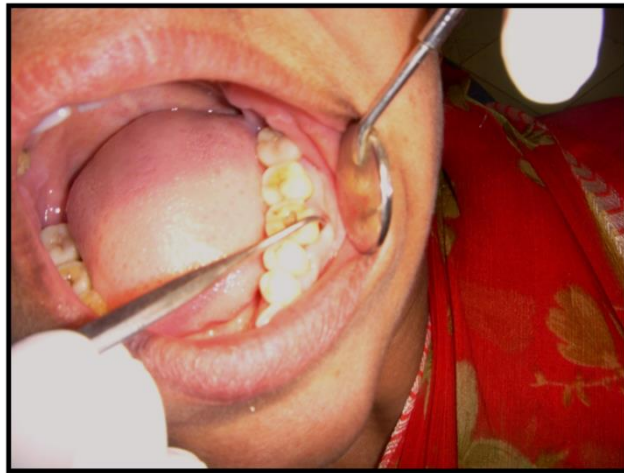
- Prosthetic failure of abutments within a splint: If a single or multirooted tooth is periodontally involved within a fixed bridge, instead of removing the entire bridge, remaining abutment support is sufficient, the root of the involved tooth is extracted.
- Endodontic failure: Hemi section is useful in cases in which there is perforation through the floor of the pulp chamber, or pulp canal of one of the roots of an endodontically involved tooth which cannot be instrumented.
- Vertical fracture of one root: The prognosis of vertical fracture is hopeless. If vertical fracture traverses one root while the other roots are unaffected, the offending root may be amputated.
- Severe destructive process: this may occur as a result of furcation or sub-gingival caries, traumatic injury, and large root perforation during endodontic therapy.

#### **Contraindications**

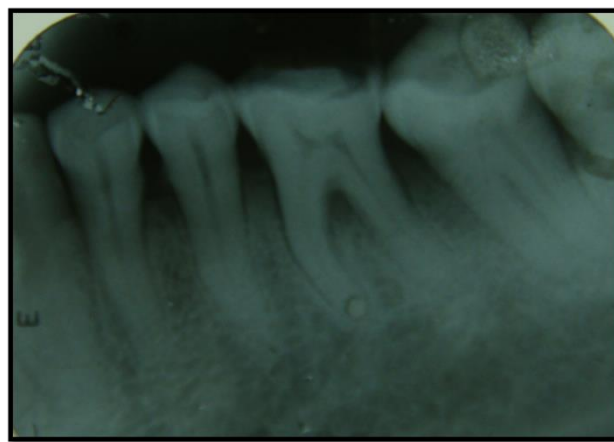
1. Strong adjacent teeth available for bridge abutments as alternatives to hemi section.
2. Inoperable canals in root to be retained.
3. Root fusion-making separation impossible.

#### **CASE REPORT**

A 42 year old woman reported to the Dental outdoor with intermittent pain on the lower left side of the mouth. On examination, the tooth was sensitive to percussion. A probing depth of 7mm was found. On radiographic examination, bone loss was present in the furcation on mesial and distal surface of the tooth. An apical lesion was visible on the mesial root. (Figure 1a,b)



**Figure.1a Preoperative intraoral image**



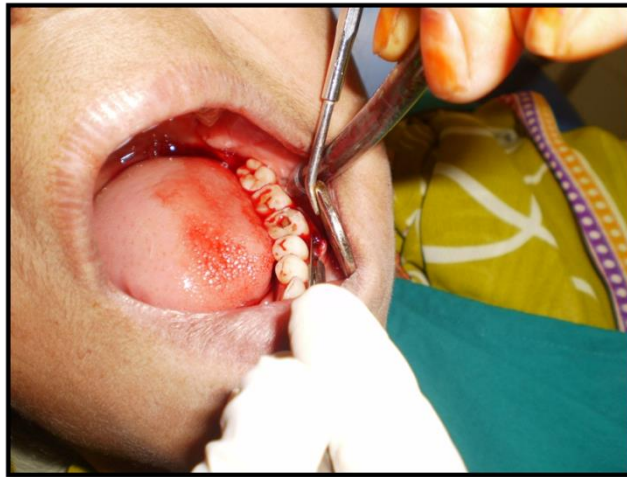
**Figure 1b. Radiograph showing radiolucency in the furcation area**

The patient was repeatedly requesting for tooth extraction. After properly explaining about the importance of retaining tooth and treatment options like tunneling, bicuspidisation with open flap debridement, patient was convinced for the bicuspidisation followed with prosthodontic rehabilitation. In order to save the tooth, root canal was done using the step back technique and canals were obturated with lateral condensation method. (Figure 2)



**Figure.2 Endodontic treatment done**

Under local anesthesia a full thickness flap was reflected with crevicular incision extending from distal surface of the left mandibular 2<sup>nd</sup> premolar to the of the left mandibular 2<sup>nd</sup> molar (figure. 3)



**Figure.3 Crevicular incision given with full thickness flap reflection**

A long shank tapered fissure carbide bur was used to make vertical cut to separate the crown. All faces of the mesial and distal roots were smoothed with an air-rotor. The flap was repositioned and sutured with 3/0 silk sutures.(Figure4. a,b)



**Figure 4a. Intraoperative picture showing the bisected halves**



**Figure 4b. Flap repositioned and sutures given.**

One week after surgery the sutures were removed and patient was sent to the Department of Prosthodontics for crown preparation on the newly made premolars. On examining after six months, there was uneventful healing with good maintenance.

## DISCUSSION

The management of deep pocket in posterior teeth with furcation involvement, most often poses a challenge. Nonsurgical management alone is less likely to eliminate the plaque and plaque retentive factors completely due to inadequate accessibility and the anatomically complex furcation area.[9] Various surgical procedures proposed for the treatment of furcation involved tooth are tunnelling, hemisection, bicuspidisation, root resection, etc. The appropriate selection of treatment procedure largely depends on amount of bone loss, angulation and position of tooth in the arch, length, divergence and curvature of roots and feasibility of endodontic management, and patients oral hygiene maintenance .

Bicuspidiatzion or root separation is the splitting of a two rooted tooth into two separate portions. The process is mostly performed on mandibular molars with buccal and lingual Class II and Class III furcation involvements. After sectioning of the teeth, both the roots were retained. In the present case report, this decision was based on the extent and pattern of bone loss, root trunk and root length, ability to eliminate the osseous defect and endodontic and restorative considerations.

In this case, radiographic and clinical parameters were satisfactory; hence, bicuspidisation technique seemed to be the most suitable option. The mandibular molar was vertically sectioned through the furcation, retaining both halves which were then treated as bicuspids. This separation tends to successfully reduce / eliminate plaque retentive (i.e.furcation) area, facilitate effective oral hygiene maintenance and prevent further attachment loss. During the treatment, occlusal contacts were repositioned in a more favorable position. Lateral forces were reduced by decreasing the cuspal inclines and eliminating the non-working contacts.

Similar studies by Dalvi et al.showed a successful result after bicuspidisation followed with bone graft and platelet rich fibrin membrane and subsequent prosthetic treatment. [10]Farshchian and Kaiser have reported the success of a molar bisection with subsequent bicuspidisation.

Its success depends on: i) Stability/adequate bone support of individual tooth sections; ii) Absence of severe root flutings; iii) Adequate separation of the roots, to create an acceptable embrasure for effective oral hygiene.[11]

The advantage of root resection is retention of some or the entire tooth.[12] It may be performed on endodontically treated teeth or vital teeth.[13] However, the failure of endodontic therapy can eventually cause failure of the procedure. Hence, to avoid subsequent unfavourable event, it is advisable to have endodontic therapy completed before resection. In our present case too endodontic treatment was performed prior to the bicuspidization.

Buhler observed 32% failure rate in root resection cases and the main etiology being endodontic pathology, root fracture and not the periodontal complications.[14] In this case, six months follow up showed a good prognosis with healthy periodontal status and absence of mobility. Hence, with appropriate case selection, root canal treatment followed by bicuspidisation can be a good, absolute and biological cost saving option with good chances of success.

## CONCLUSION

With recent advancements in dentistry, bicuspidisation has received good acceptance as a conservative and reliable dental treatment. Hence, it may be an apt alternative to extraction and should be well discussed with the patients during consideration of treatment option.

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