



Bicuspidization –restoration of split molar – a case report

KEYWORDS

Bicuspidization, furcation defect, hemisection

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ABSTRACT Restorative treatment planning is often confounded when periodontal attachment loss, caries or tooth fracture involves the furcation area of molars. Advances in dentistry, as well as the increased desire of patients to maintain their dentition, have led to treatment of teeth that once would have been separated. In order to carry out this present day mandate, periodontally diseased teeth with severe bone loss at furcation area may well be retained by separation of their roots. This article discusses a case of bicuspidization of left mandibular first molar with subsequent restoration of tooth.

Introduction

The treatment, management and long-term retention of mandibular molar teeth exhibiting furcation invasions, always have been a challenge to the discerning general dentist or dental specialist. [1] Through bicuspidization a single molar tooth can be converted into two bicuspid. If both the roots are to be retained, there should be a considerable spread between them for restorative procedures to be successful. [2, 3]

Indications for bicuspidization are following:

1. Root fracture Severe bone loss affecting one or more roots untreatable with regenerative procedures
2. Class II or III furcation invasions or involvements
3. Inability to successfully treat and fill a canal
4. Severe root proximity inadequate for a proper embrasure space
5. Root trunk fracture or decay with invasion of the biological width

Contraindications include:

1. Poor oral hygiene
2. Fused roots
3. Unfavourable tissue architecture
4. Retained roots endodontically untreatable

Case report

A 23 years old male patient visited with chief complaint of pain in lower left back tooth region since ten days. On examination a large carious lesion was observed in 36 with pain on percussion. [Fig.1] Intraoral periapical radiograph of the tooth showed a large carious lesion involving large portion of crown, extending up to furcation area. Periapical area showed radiolucent area around both mesial and distal roots extending up to apical third of roots. [Fig.2] Root canal treatment and subsequent bicuspidization was planned in this case. Accordingly access cavity was prepared and the working canal length was determined and the canals were biomechanically prepared using step back technique. Lateral condensation technique was followed in the mesial and the distal canal for obturation. [Fig.3]

A long shank straight fissure diamond point was used to make vertical cut toward the bifurcation area. Single molar is now separated in two crowns. [Fig 4] The furcation area was trimmed to ensure that no residual debris were present that could cause further periodontal irritation. Curettage of the furcation area was done, which became accessible on separation. Damaged tooth structure was reconstructed with

silver amalgam core [Fig. 5a. and 5b.] The occlusal table was minimized to redirect the forces along the long axis of each root and two separate crowns were placed on mesial & distal half of the tooth. [Fig.6] Case was followed up postoperatively.

Discussion

Earlier the cases of furcal caries and large perforations were considered untreatable. If there is a severe bone loss involving either of the surfaces of the root, another approach called hemisection can be used. [1, 4] Farshchian and Kaiser have reported the success of a molar bisection with subsequent bicuspidization. [5] They stated that the success of bicuspidization depends on three factors

1. Stability and adequacy of 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.

Root separation or resection has been used successfully to retain teeth with furcation involvement. However, there are few disadvantages associated with it. As with any surgical procedure, it can cause pain and anxiety. [6, 7] Root surfaces that are reshaped by grinding in the furcation or at the site of hemisection are more susceptible to caries often a favourable result may be negated by decay after treatment. Failure of endodontic therapy due to any reason will cause failure of the procedure. [8, 9] In addition, when the tooth has lost part of its root support, it will require a restoration to permit it to function independently or to serve as an abutment for a splint or bridge.

In our case bicuspidization was performed to avoid extraction of tooth. Subsequent follow up showed a good bone healing response. This suggested that the procedure, occlusal adjustments made and the angulation of the root was perfect to aid in the recovery of the tooth. 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.

Conclusion-

Bicuspidization is a procedure which represents a form of

conservative dentistry which aims to retain as much of the original tooth structure as possible. 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.

Disclosures –

The grants, patent licensing arrangements, consultancies, stock or other equity ownership, advisory board memberships or payments were not related for conducting and publicizing this case.

Conflict of interest –

The authors declared that this case has no personal and financial relationship with any corporate affiliations or any other organizations.



Fig.1 Preoperative intraoral photograph



Fig.2 IOPA depicting carious lesion with furcation involvement



Fig.3 IOPA showing obturation of two root canals



Fig.4 Photograph showing division of molar into two separated crowns



Fig.5 Post operative view with core build up on separate crowns



Fig.5 Post operative view with core build up on separate crowns



Fig. 6 Photograph showing the two separate crown restored with metal ceramic crown

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