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RESEARCH ARTICLE

BICUSPIDIZATION-TWINNING A MOLAR TOOTH

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Abstract

Restoration of teeth is often confounded by caries, periodontal attachment loss or fracture, especially when it presents itself in the furcation area of multirooted teeth. Since such circumstances warrant a multidisciplinary approach, it imposes a special challenge on the dentist to conserve the affected teeth. Although regenerative therapy is the norm in such periodontally affected cases, usually the defects are not conducive for regeneration to be carried out. According to the present mandate, bicuspidization can be epitomized as a conservative form of resective surgery wherein the affected tooth is split into two halves along with the root portion. In this case report, class III furcation involvement of the right mandibular molar with advanced bone loss until the apical third of the root, was successfully treated by bicuspidization. The resultant 18 months follow up shows a restored tooth which is fully functional and without any biologic complications.

INTRODUCTION

Therapeutic decision making and successful treatment of furcation-involved molars poses a formidable challenge to dentists. There is a wide array of treatment options for furcation management ranging from non surgical therapy to resective and regenerative measures. Farrar introduced root resection procedures, which has been used to treat Class II and Class III furcation-involved molars [1]. Bicuspidization/bisection is the separation of mesial and distal roots of mandibular molars along with the crown portion, where both segments are then retained individually. Through this procedure, furcation-involved molars can be converted into non-furcated single-rooted teeth, thereby providing a favorable environment for oral hygiene for patients.

A systematic review carried out by Needleman in 2010 showed that the survival rate of molars treated non-surgically was >90% (follow up 5-9 years), whereas surgical resective procedures showed 62-100% (follow-up 5-13 years), and GTR 83.3-100% (follow up 5-12 years) [2]. Good long term survival rate of upto 100% can be obtained even with resective surgery, but case selection plays a crucial factor due to the highly complex and technique

sensitive nature of resective procedures. We present a case of class III furcation involved mandibular molar (horizontal bone loss >5mm) successfully treated by bicuspidization with a follow up of 18 months.

CASE REPORT:

A 28 year old male patient presented with pain in his right lower back teeth region for over 2 weeks (Figure 1). There was persistent pain following endodontic treatment. Anamnesis revealed that the patient was systemically healthy. IOPA revealed Glickman's class III furcation involvement in relation to right mandibular molar (46) with a horizontal component of greater than 5mm. Bicuspidization was planned since the divergence of roots and the pattern of bone loss was more conducive for resective surgery. Oral prophylaxis was performed and oral hygiene instructions with an emphasis on periodontal maintenance were elaborated to the patient. After administration of 2% lignocaine (1:1,00,000 adrenaline), full thickness mucoperiosteal flap was raised in relation to 46. Complete debridement was carried out and the bony defect was visualized. Since the defect was not conducive for regeneration, diamond burs in high speed hand-piece was utilized to section the tooth (Figure 2). Care was taken to section the tooth into two equal halves till the radicular portion (Figure 3). Osseous surgery was done in order to obtain a positive architecture. The flap was approximated and direct loop sutures were placed. Occlusal reduction was carried out and temporary acrylic crowns were placed (Figure 4). After 3 months, the patient was recalled and assessed for pain and mobility. Since there were no complications, the two halves were restored using metal crowns (Figure 5). Periodic recalls and constant motivation to follow the oral hygiene instructions were performed. At 18 months follow up, a fully functional prosthesis with stable bone levels were observed.

DISCUSSION:

In the current literature, bicuspidization falls under the category of root separation procedure wherein the root complex is sectioned with maintenance of the roots. Newell [3] describes the importance of clinical skill in the correct execution of root resection and separation techniques. Since bicuspidization is highly complex, great care has to be taken in case selection. Murphy [4] has given certain criteria which have to be taken into consideration while selecting a case for root separation. He emphasizes that the furcation involvement should be class II/III with moderate vertical attachment loss and well displayed divergence of roots. He has also reported that the root trunk should be short to moderate, with interproximal and furcal bone levels at the same height. In our case, afore mentioned criteria were fulfilled, following which bicuspidization was performed. Carnevale[5] describes the procedure that stresses on pre-operative endodontics and separation of the root during the first tooth preparation and temporization phase. As observed by Carnevale, a 3 month waiting period was observed before the placement of the final crowns.

Since the restoration of teeth forms a major component in this technique, Di Febo[6] et al suggested a 'combined preparation' to modify the emergence profile. The procedure had the objective of creating convex surfaces that are more conducive for oral hygiene procedures. It also employs the final preparation of the tooth to be 'knife-edged' margin. The same guidelines were followed in our case wherein a knife-edged margin was inculcated into the tooth preparation and the root convexity was achieved. According to the authors [7-9], flat surfaces obtained with 'combined preparation' allow for easy plaque control and better maintenance of periodontal health.

Thus a combined interdisciplinary approach can be performed in order to salvage a functionally important tooth such as the mandibular molar.

Figure 1: Grade III furcation in 46- clinical detection using Nabers probe

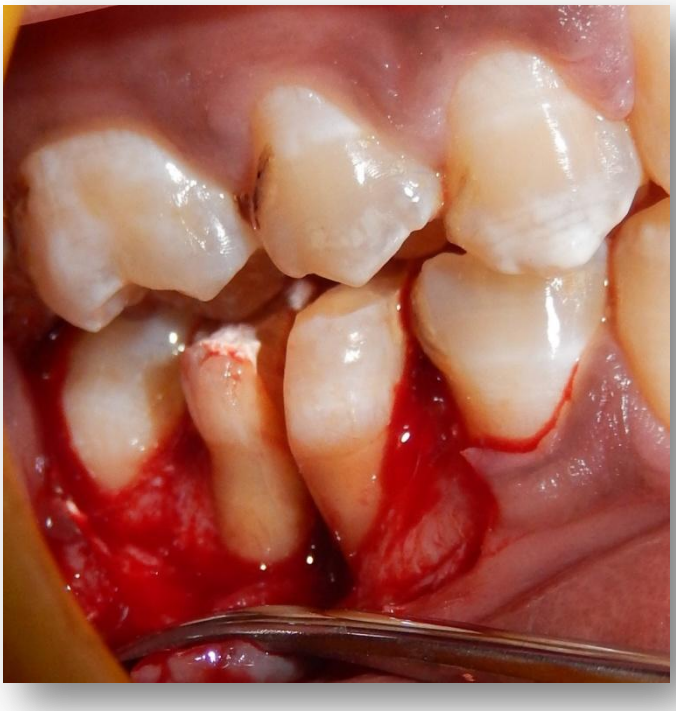

Figure 2: Sectioning of the mandibular molar using high speed aerotor

Figure 3: IOPA reveals sectioned coronal and corresponding radicular halves of 46

Figure 4: Temporization of the split tooth using acrylic crowns

Figure 5: Final metal restorations on the twinned mandibular molar

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REFERENCES:
1. Farrar JN. Radical and heroic treatment of alveolar abscess by amputation of roots of teeth. Dental Cosmos 1884;26:79.

2. Needleman I. How long do multirooted teeth with furcation involvement survive with treatment?

Evid Based Dent. 2010;11(2):38-9.

3. Newell DH. The role of the prosthodontist in restoring root-resected molars: a study of 70 molar root resections. J Prosthet Dent 1991: 65: 7–15.

4. Murphy KG. The role of guided tissue regeneration in the
treatment of furcation defects. In preparation.

5. Carnevale G, Pontoriero R, Hurzeler M. Management of furcation involvement.
Periodontol 2000 1995: 9: 69–89.

6. Di Febo G, Carnevale G, Sterrantino SF. Treatment of case of advanced peridontitis: clinical procedures utilizing the ‘‘combined prepartion’’ technique.
Int J Periodontics Restorative Dent 1985: 1: 52–63.

7. Carnevale G, Pontoriero R, Hurzeler M. Management of furcation involvement.
Periodontol 2000 1995: 9: 69–89.

8. Chen, SY, Wang H-L, Glickman GN. The influence of endodontic treatment upon periodontal wound healing.
J Clin Periodontol 1997: 24: 449–456.

9. Donald HL, Jeansonne BG, Gardiner DM, Sarkar NK. In- fluence of dential adhesives and a prefabricated post on fracture resistance of silver amalgam cores.
J Prosthet Dent 1997: 77: 17–22