

BICUSPIDIZATION – A CONSERVATIVE APPROACH FOR GRADE III FURCATION INVOLVED MANDIBULAR MOLAR: A CASE REPORT

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ABSTRACT

With increasing approach and acceptance towards preserving the natural dentition, the conservative treatment options are considered primary to teeth extractions and replacements. Bicuspidization is a surgical procedure of splitting mandibular molars into two portions – mesial and distal with their crown and root structures. It is usually carried out in cases of root fractures, failed endodontic treatments and grade III furcation involvement where oral hygiene maintenance is difficult, thus to prevent further bone loss and ultimately tooth loss.

Keywords: Bicuspidization, Grade III furcation involvement, Mandibular molar treatment.

INTRODUCTION

CASE REPORT

A 38-year-old female patient reported to the department of periodontology and oral implantology with a chief complaint of cracked crown and discomfort with respect to lower left back tooth region since a month. Patient gave a dental history of root canal treatment with respect to the concerned teeth about 2 years ago followed by prosthetic treatment. Patient was apparently alright until a month ago when she bit on a hard substance accidentally which lead to cracked crown and discomfort in the lower left back tooth region on chewing.

Patient also gave a past dental history of root canal treatment followed by metal prosthesis with respect to two others in lower right and left back tooth region about 2 years ago.

Patient's medical and family history was non-contributory.

On clinical examination, plaque and calculus was present. Probing depths were in the range of 2-3 mm with respect to all the teeth except for 6 mm probing depth with 36 around the furcation area. Metal crown was seen with respect to 35 and 46. Tooth coloured restoration was present with respect to 36.36 was sensitive to percussion.

According to Glickman (1953), Grade III furcation involvement was present with 36 when examined with Nabers Probe. (Fig.1) Bleeding on probing was observed in the same area.

On radiographic examination, radio-opaque filling material was observed in each root with restoration extending till the furcation area. Vertical bone loss was evident at the furcation area. (Fig. 2) The bony support of both roots was completely intact. Periapical radiolucency was observed with each root.

As the major bulk of the tooth was restored and there was little support of the natural crown structure, the prognosis of the tooth was compromised. The patient was informed about the same and consent was taken regarding the procedure.

In order to avoid extraction and preserve the tooth, the procedure of Bicuspidization was suggested to the patient, which she agreed upon. Surgical procedure was planned with bicuspidization technique. Under local anaesthesia, full thickness flap was reflected with the crevicular incision extending from the distal surface of the mandibular 2nd premolar to the midfacial surface of the mandibular 2nd molar. After the flap elevation, the area was curetted thoroughly using Gracey's No. curette. Povidone-Iodine irrigation was carried out following the curettage. The vertical cut method was used to separate the crown. (Fig. 3) A long shank tapered fissure carbide bur in contra angled hand piece with adequate irrigation was used to make vertical cut toward the bifurcation area. All faces of the mesial and distal roots were instrumented and the spurs were smoothed with aerotor. Post-surgical radiograph was taken to confirm the procedure. (Fig. 4) After the irrigation with saline solution, the flap was repositioned and sutured with 3/0 silk sutures. (Fig. 5) Post op instructions like to avoid chewing from the surgical side, to absolutely not bite on hard substances were given.

Patient was recalled after a week for suture removal.

Patient was re-evaluated clinically and radiographically after 4 weeks and 12 weeks for bone support, mobility, gingival health and oral hygiene.

At 3 months, adequate bone support, no mobility and adequate gingival health observed with 36. Endodontic treatment - Post and Core of the 2 cuspids was carried out followed by 2 separate metal prosthesis.

DISCUSSION

Park have suggested that hemi-section of molars with questionable prognosis can maintain the teeth without detectable bone loss for a long-term period, provided that the patient has optimal oral hygiene. Bicuspidisation which is a surgical procedure carried out exclusively on the mandibular molars, where the mesial and distal roots are separated with their respective crown portions. This

surgical separation eliminates the existence of a furcation and makes it easy for the patient to use an interdental brush for hygiene maintenance.⁴ The mandibular molar is vertically split into 2 halves through the furcation, without removing either half, leaving two separate roots that then are treated as bicuspid.

Farshchian and Kaiser⁵ have reported the success of a molar bisection depending 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.

Various indications for the Bicuspidization procedure are root fracture, grade III furcation involvement, failed Endodontic treatment, etc.⁶ In this case report, Grade III furcation involvement which suspected due to the improper endodontic treatment causing ledge formation towards the furcation area leading to bone loss. All this lead to reduced oral hygiene maintenance and further loss of periodontal support. Also, as the teeth were already root canal treated, Bicuspidization was a most viable option for the patient.

With adequate maintenance and follow visits, the prognosis of the tooth can be improved and the natural dentition can be restored for longer duration.

CONCLUSION

Bicuspidization is, therefore, a more conservative approach in mandibular molars with grade III furcation involvement but have adequate bone support around each root. It helps avoid procedures like tooth extraction and implant placement, thus has better patient acceptance and compliance. The procedure aids in better maintenance of oral hygiene by ease in the use of interdental aids by the patient. Bicuspidization helps in prolonging the life of the natural dentition in health and function when adhered to the proper periodontic, endodontic and prosthodontic treatment protocols followed by optimum oral hygiene maintenance by the patient.

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LEGENDS:



Figure 1: Clinical Examination: Nabers Probe indicating Grade III furcation involvement in 36



Figure 2: Radiographic Examination: Radiolucency seen in the furcation area of root canal treated 36.



Figure 3: Bicuspidization of 36 into mesial and distal structures.



Figure 4: Post-surgical radiographic evaluation of bicuspidization of 36.



Figure 5: Flap closure and 3-0 silk sutures placed between the two separated tooth structures.