

Root Resection – A Dark Horse in Management Offurcation Involved Maxillary Molar- A Case Report

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Abstract: Furcation involvement is the occurrence of periodontal disease involving the bifurcations or the trifurcations of the multirooted teeth. The survival rates are usually poor for advanced furcation involvement cases. Various treatment options both non surgical and surgical are available for furcation involvement. The routine regenerative and resective procedures along with the conventional flap therapy were targeting the alveolar bone around the teeth for managing furcation cases. Recent approaches have focused on treating the diseased tooth along with the alveolar bone for effective management of furcation involvement cases. The procedures that come under this category include hemisection and root resection. Root resection is the procedure that is usually carried out on upper molars where a root is amputated for treating the periodontal and the periapical infection. This is usually done following endodontic therapy. In this case report root resection was performed in an upper molar with furcation involvement following endodontic therapy and the clinical and radiographic outcome 6 months after treatment was evaluated.

Keywords: root resection ,hemisection , furcation

I. Introduction

Furcation involvement is characterized by the periodontal disease invading the furcation regions of the multi rooted teeth. The treatment modalities that are available are scaling and root planning in the non surgical category and the surgical management includes osteoplasty or ostectomy, odontoplasty, bicuspidization, root resection and hemisectionetc. Furcation involvement can be classified into four classes according to Glickman (1953). Class I shows suprabony incipient lesion with no radiographic changes. Class II invasion shows cul-de-sac and a definite horizontal bone loss with may or may not visible radiographic changes. Class III furcation shows a through and through invasion of the furcation area with soft tissue covering and radiograph shows bone loss. Class IV furcation also shows through and through invasion, clinically visible due to soft tissue recession, radiographs shows bone loss. It has been observed that among periodontally compromised teeth, it is the maxillary molars that are more likely to be lost or extracted because when there is inter radicular loss of attachment there is an enhanced risk of additional attachment loss that results in a poor prognosis

Root resection is the process by which one or more of the roots of a tooth are removed at the level of furcation while leaving the crown and the remaining roots in function. This procedure was first used by Farrar for treating class II and class III furcationcases.Hemisection is the procedure that is carried out in cases of mandibular molars that usually have 2 roots.

Case selection is a critical step for achieving the desired result in furcation involvement. In order to have a good prognosis pre treatment evaluation of the case clinically and radiographically is mandatory. The decision as to which root needs to be resected is arrived based on the root that is affected, the supporting tissue around the tooth, the root anatomy and curvature etc. .Minsk And Poisonsuggested that root resection is a valuable conservative procedure in cases of tooth with questionable prognosis and associated problems such as nerve landmarks or sinus floor present in close approximation to the tooth where other therapeutic procedures may not be permissible.

Indications for Root resection

1. Teeth that cannot be maintained in a conservative manner and resection provides the best long term prognosis.
2. Terminal molars which has a stable antagonist.
3. Abutment tooth
4. Periodontal problems due to root proximity
5. Grade II and III Furcation involvement causing plaque accumulation with radiographic indication of a root affected with the defect.

6. Horizontal root fractures and dehiscence of alveolar bone along with gingival recession exposing one root where it is difficult to treat conservatively, root resection is indicated with predictable short term and long term results
7. Aesthetic considerations where mucogingival surgeries cannot be performed

Contraindications for Root resection⁹

1. Inadequate periodontal support
2. Excessive mobility
3. Unfavourable position of the tooth and the root form
4. Medically compromised patients.

The prognosis of the root resection procedure for furcation involvement has been contradictory. Some authors have reported a more than 90% survival rate and on the other hand some have reported 30% failure rate. The functional success in root resection therapy has been found to be good and comparable to implant therapy by different studies.

II. Case Report

A 33 year old male visited the outpatient department of Periodontics, Sri Venkateshwara Dental College, Chennai with the complaint of pain in the right upper back tooth region. On clinical examination in relation to 16 there was a periodontal pocket with furcation involvement and pus discharge was seen. The tooth had Grade II mobility but there was no decay seen. The tooth was tender on percussion. The gingival around the tooth showed recession and exhibited bleeding on probing. There was a small swelling in the alveolar mucosa between 16 and 17. The overlying mucosa of the swelling was red and shiny [Figure 1]. The patient had tenderness and enlargement of the submandibular lymph node on the right side. The medical history, surgical history and the drug history of the patient was taken and no relevant past medical history revealed. Intraoral periapical radiographs were taken of the region and the presence of furcation defect with loss of lamina dura and vertical defect of alveolar bone upto the middle third was seen in the mesial aspect of the tooth. There was a periapical radiolucency of size 0.5cm in diameter was seen in relation to the mesial root of 16. The case was diagnosed as endo-perio lesion and the treatment plan that was suggested was the endodontic management of the tooth followed by the mesial root resection and bone graft placement.

Root canal treatment of the tooth was performed and the apical seal was achieved [Figure 2]. The length of the root, the remaining alveolar bone, the strength of the existing tooth structure was clinically and radiographically studied and then the surgical procedure was performed. Under local anaesthesia (lidocaine 2% with 1:80,000 epinephrine), an intra-sulcular incision was made around the 16 tooth and a vertical relieving incision placed in between 15 and 16. The flap was elevated and the mesial root was exposed. High speed rotary motor with adequate irrigation was used to amputate the mesial root. The surrounding bone around the next teeth was preserved to prevent bone resorption. Post resection the region was thoroughly curetted, then the bone graft (Ossify) placed. The flap was repositioned properly and sutured. A periodontal pack was placed to prevent the apical movement of the flap [Figure 3]. Antibiotics and analgesics were prescribed and oral hygiene maintenance instructions and post surgical instructions were given. The patient was reviewed first after one month and the clinical stability of the tooth was observed. The tooth was adequately stabilized and was maintained throughout the observation period of 6 months. After six months radiographic evaluation and clinical evaluation of the surgical site was done. There was resolution of the infection with improved stability of the tooth which showed that the condition was successfully managed. To further protect the tooth crown preparation was performed and metal ceramic crown was placed [Figure 4].

III. Discussion

Furcation defects presents as a complex problem in the treatment of periodontal disease, due to its complex and irregular anatomy. The anatomical characteristics such as the size of the furcation entrance, the presence of root concavities and the uneven surface of the roof of the furcation all these put together cause great difficulty in instrumentation of the inter-radicular area. Root resection is the procedure done in cases of grade II or III furcation involvement when the conservative procedures have either failed or cannot be done. This is a highly technical procedure so cases selection is a critical step and complete evaluation is necessary. In case of periodontally diseased molars root resection has been found to be a viable option. In this case the patient primarily had a periodontal disease which was secondarily affecting the root of the teeth. Careful evaluation of the radiographs revealed the presence of a furcation defect, bone loss and a periapical radiolucency. The remaining structures were found to be normal. The root resection therapy was selected for this case as it ideally had the disease involving a single root with the remaining tooth structure stable with adequate bone support.

Endodontic therapy is done for the tooth prior to root resection as vital root resection is a difficult

procedure and unexpected perforation and root fractures can occur and so in the present case also endodontic management was done prior to the root resection procedure. The efficacy and efficiency of this procedure has been controversial and the survival rate and success rates have differed between studies. The overall survival rate of root resected molars have been reported in a recent study is 91.7%. The short term success rate has been found to be good in this case when the follow up was done at 6 months period. Long term evaluation will give a better idea regarding the success of the procedure.

IV. Conclusion

In the era of implant therapy root resection is considered to be an old school of thought. Though the dilemmas exist with regards to the therapy and the clinical acumen and expertise required is higher it is still considered as a viable treatment modality in the case of furcation defects. Proper evaluation and selection of the case with good surgical procedure and a suitable prosthetic rehabilitation and regular maintenance care will help in saving the tooth and show a good success rate in the long run with minimal complications.

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