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PERIODONTAL ABSCESS TO PERIODONTAL PROSTHESIS: A MULTI-DISCIPLINARY JOURNEY

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ABSTRACT

Aim: The treatment and long-term retention of mandibular molar teeth with furcation involvement have always been a challenge in periodontal therapy. Root resection has been used successfully to retain teeth with furcation involvement. The term root resection refers to the resection and removal of either of the roots of mandibular molar, which may be affected by periodontal, endodontic, structural deformity. There should be >50% bone support of the remaining roots at the time of the root resection in treating periodontally diseased mandibular molars, which acts as an important factor to obtain good results. In addition, a careful prosthetic plan should be designed to avoid a fracture of resected molars related to biomechanic impairment.

Case Report: This case report of a 23 year old female provides an overview of the feasibility of mesial root resection and bone grafting along with CGF membrane of mandibular right first molar severely affected by perio-endo lesion thus maintaining the function of the teeth.

Discussion: Root resection represents a form of conservative procedure that aims at retaining as much of the original tooth structure as possible thus acting as an alternative to extraction. Root resection of the affected tooth allows the preservation of tooth structure, alveolar bone and maintains the normal function thus being advantageous over other treatment options.

Conclusion: With the results of this case report, the suggested treatment of periodontal abscess with Grade-III furcation by root canal treatment followed by root resection and periodontal flap procedure with bone graft placement along with Concentrated Growth Factor in the furcation defect of the involved tooth could result in successful resolution of infection and excellent healing in the residual defect of furcation which was considered hopeless thus maintaining the function of the dentition.

Key Words: Periodontal abscess, Grade III furcation, CGF, Root resection, Root amputation, Periodontal prosthesis

INTRODUCTION

Root resection is the process by which one or more of the roots of a tooth are removed at the level of the furcation while leaving the crown and remaining roots in function.¹ It was Farrar, who introduced the root-resection procedure, to treat Grade II and III furcation-involved molars by which, furcation-involved molars can be converted to non-furcated single-root teeth and to provide a favorable environment for oral hygiene for patients as well as clinicians².

Advances in dentistry, as well as patient's desire to maintain their dentition, have lead to treatment and retain the teeth that once would have been extracted. In order to carry out

this present day scenario, periodontally diseased teeth with severe bone loss at furcation area may well be retained by amputation of the diseased root. This case report describes simple procedure of root resection of periodontally involved mandibular molar and its subsequent restoration to enhance its function with normal dentition.

CASE REPORT

A 23 years old female patient reported to department of Periodontics with the chief complaint of painful tooth and gums in relation to lower right back region of jaw with the history of food lodgement in between the teeth. On clinical evalu-

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ation, the tooth 45 was tilted distally creating a non-intact proximal relationship with tooth 46 along with an interproximal caries(Class II) involving the tooth 45 with no signs of pulpal exposure. On periodontal examination, there was increase in probing depth of 12mm (UNC-15 probe, GDC™) interdentially distal to 45 and mesial to 46 and Grade III furcation defect exhibiting horizontal involvement 9mm (Nabers probe, GDC™)of 46 both buccally and lingually. Mobility was Grade II on the day of examination. Radiographic examination revealed severe bone loss that is oblique to occlusal plane extending from CEJ of 45,46 inferiorly 2mm beyond the apex of mesial root of 46 with a diffuse radiolucency extending along the mesial aspect of mesial root of 46 to the periapical region of both the roots of 46 with loss of lamina dura. A profound radiolucency within the furcation region of 46 can also be appreciated resulting from loss of bone in furcation region and buccal & lingual cortical plates [fig.1]. With the clinical and radiographic findings, it was diagnosed as periodontal abscess in relation to 45 &46.

A treatment plan was formulated to perform endodontic treatment of 46 followed by mesial root resection, since the bone loss was severe involving the mesial root and the surface roughness of mesial root making the periodontal instrumentation as a tough task. Following root resection, the defect was planned to be filled with bone graft with placement of CGF membrane over it and fabricating periodontal prosthesis made of metal ceramic for 45 & 46, since there was no sufficient inter-proximal bone to support the tooth following mesial root resection of 46 and also to eliminate food impaction between the two teeth.

Emergency treatment included drainage and debridement of the abscess with prescription of antibiotic regimen (Amoxicillin 500mg & Metronidazole 400 mg) thrice a day and analgesic (Acelefenac paracetamol) twice a day for five days. Patient was re-evaluated after five days, as the swelling and inflammation subsided; root canal treatment was initiated at the second appointment [fig.2]. After evaluation of Phase I therapy, the probing depth remained the same as day 1 [fig.3] indicating the need for periodontal surgery. Hence, Periodontal regenerative procedure using alloplastic osteoconductive bone graft material (Osseograft™) with CGF was instituted.

Under local anesthesia, a full thickness mucoperiosteal flaps was elevated on both buccal and lingually. On surgical debridement, a Grade III furcation involvement of 46 was evident [fig.4] which was undergone root resection and filled with the bone graft material [fig.5] and placed with Concentrated Growth Factor over it which was prepared as membrane [fig.6,7,8]. Flaps were repositioned with Interrupted figure 8 sutures using 3-0 black silk sutures [fig.9] and periodontal dressing (COE Pack™) was applied over the surgical site and post-operative instructions were given. Resected root shown surface roughness with calculus attachment [fig.10]

which was clinically a challenging entity for instrumentation. Post-operative medications included Antibiotics and analgesic twice a day for five days. Post-operative healing was good with minimal discomfort and Radiograph was taken a week following mesial root resection [fig.11]. 2 weeks following the Surgery, tooth preparation for the teeth 45 &46 was done [fig.12] and a periodontal prosthesis (Porcelain fused to metal) crown was fixed and cemented [fig.13,14,15]. Follow up was done for one week, one month, 6 months [fig.16].

Recall appointments included reinforcement of oral hygiene instructions, scaling if required and periapical radiograph of the involved tooth. Patient revealed no bleeding on probing, no suppuration or episode of abscess and no mobility of tooth as well as no complaint of food impaction. Indicating successful resolution of infection and excellent healing in the residual defect of furcation.

DISCUSSION

The goal of therapy for a periodontal abscess is elimination of the acute signs and symptoms as soon as possible. Treatment considerations includes establishing drainage by debriding the pocket and removing plaque, calculus, and other irritants and /or incising the abscess. Other treatments may include irrigation of the pocket, limited occlusal adjustment, and administration of antimicrobials and management of patient discomfort. A surgical procedure for access for debridement may be considered. In some circumstances extraction of the tooth may be necessary. A comprehensive periodontal evaluation should follow resolution of the acute condition.³

The treatment of the acute periodontal abscess usually includes two stages: the management of the acute lesion; and the appropriate treatment of the original and /or residual lesion, once the acute situation has been controlled.⁴

If the tooth is severely damaged, and its prognosis is bad, one of the most effective treatments could be tooth extraction.⁵

Treatment of periodontal abscesses includes, a protocol that has been recommended: drainage through the pocket, scaling of the tooth surface, compression and debridement of the soft tissue wall and irrigation with sterile saline. After therapy, the patient should rinse with warm saline and be examined for the abscess resolution after 24–48 h. 1 week later, the definitive treatment should be carried out.

Furcation involvement represent a formidable problem in the treatment of periodontal disease, principally related to the complex and irregular anatomy of furcations. The anatomical characteristics of the areas involved, particularly the size of the furcation entrance, the presence of root concavities and the uneven surface of the roof of the furcation, make ad-

equate instrumentation of the inter-radicular area extremely difficult.⁶

Concentrated growth factors (CGF) was first developed by Sacco.⁷ Use of CGF in regeneration shows potential benefits including role on cell migration, cell proliferation and angiogenesis in tissue regeneration phase. CGF barrier is effective to regenerate bone formation associated with grafting procedure. In addition, the mixture of CGF and bone graft could reduce healing time compared to conventional GBR procedure.

Success of root resection procedures depends on proper case selection. The morphology of the portion of the tooth remaining after root separation and resection therapy is of primary importance for long term the prognosis of the tooth. In this case, the tooth 46 had sufficient crown: Root ratio, sufficient root length, and thickness to undergo root resection, which would allow the resected remaining segment to bear the occlusal load adequately.

Molars that underwent respective procedures due to periodontal reasons had a higher success rate than those due to endodontic causes.⁸ Clinical prediction of the long-term prognosis is crucial in order to ensure the sequence of therapy and avoiding additional expenditure for the patient. This requires proper diagnosis, treatment planning, and execution by all the clinicians involved in the inter-disciplinary approach.

Adequate knowledge of the anatomy of the furcation region is crucial in both planning and execution of the treatment procedure. The degree of success in managing furcation involvement is inversely related to the horizontal probing depth.⁹ As the furcation invasion progresses, the choice of therapy and the role of inter-disciplinary dentistry becomes more important.

Case selection affects the outcome of root resection as a treatment of choice where endodontic complications affecting one root of multi-rooted tooth. Factors such as occlusal forces, tooth restorability and the value of the remaining roots must be examined before treatment.¹⁰ In the present case, the tooth was able to retain form and function 6 months following endodontic therapy, mesial root resection with bone grafting, followed by prosthesis fixation.

CONCLUSION

Periodontal abscess with secondary endodontic involvement require both endodontic and periodontal therapies. The prognosis of such lesion depends chiefly upon various factors that includes the severity of the periodontal involvement,

amount of bone destruction, mobility of the involved tooth, patient compliance and the response to the treatment advocated. This article presents a technique to maintain tooth structure in a compromised tooth supporting the fact that the long term success of treating such tooth is largely depending on proper diagnosis, selection of patients who maintained good oral hygiene following phase-I therapy, well planned surgical and restorative management. The suggested treatment of periodontal abscess with Grade-III furcation by root canal treatment followed by root resection and periodontal flap procedure with bone graft placement along with Concentrated Growth Factor in the furcation defect of the involved tooth could result in complete healing of tooth which was considered hopeless. Further studies with series of case reports should be performed to confirm and support the clinical outcome of current case report.

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Figure 1: Pretreatment radiograph.



Figure 4: Grade III furcation involvement in relation to 46.



Figure 2: Radiograph after endodontic therapy.



Figure 5: Mesial root of 46 resected and the defect filled with bone graft.



Figure 3: Probing depth of 12 mm in relation to 45 and 46.

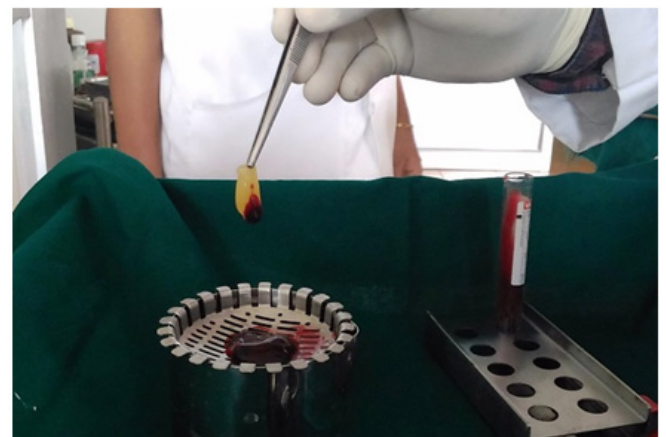


Figure 6: Concentrated Growth Factor (CGF).

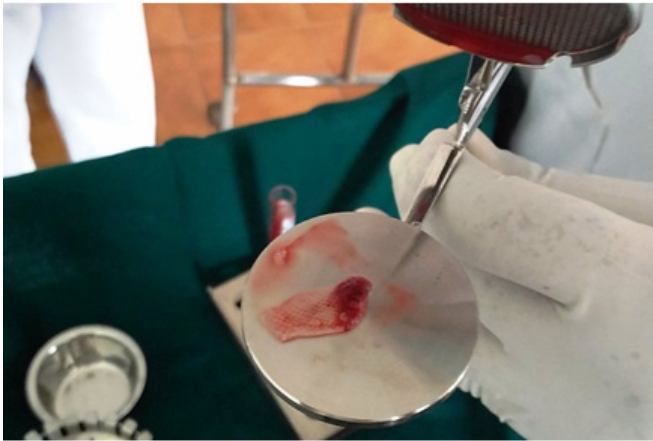


Figure 7: CGF prepared as membrane.



Figure 10: Resected mesial root of 46 showing surface roughness.



Figure 8: CGF placed as membrane.

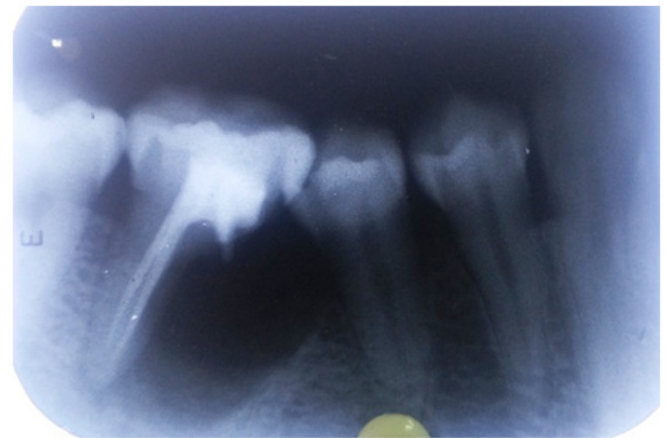


Figure 11: Postoperative radiograph taken a week after surgery.



Figure 9: Flap positioned to the original position and sutured.



Figure 12: Periodontal prosthesis combining 45 and 46 (Porcelain fused metal).



Figure 13: Permanent restoration of periodontal prosthesis (Occlusal view).



Figure 15: Periodontal prosthesis in occlusion (Facial view).



Figure 14: Periodontal prosthesis (Facial view).



Figure 16: 6 months post-op radiograph showing evidence of bonefill in the defect.