Management of Mandibular Molar Having Sub-Gingival Caries by Root Amputation: A Case Report

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Abstract

Conservative management of a tooth has always been the primary option for a dental clinician in the management of severely decayed teeth. Therefore instead of going for the extraction or elaborate and expensive treatment such as implant-supported prosthesis procedures like root amputation/resection and hemisection can be opted to salvage these compromised teeth for longer period of functioning. Root amputation is a procedure of removing the root portion of the multirooted tooth that has been affected with subgingival caries, periapical pathology, or any other defects. This article describes a case report of root amputation in mandibular molars.

Keywords: *Root amputation; Root canal treatment; Mandibular molar.*

Introduction

The increasing awareness of patients to maintain proper oral hygiene and preserving teeth for prolonged periods, have led to the treatment and restoration of teeth that once would have been extracted. Assessment of endodontic and periodontal problems related to the tooth is vital before selecting the case. Various strategies have been used to restore such mutilated tooth such as Root amputation/Root resection, Hemisection, and Bicuspidization. Root amputation is a minor surgical procedure in which an affected or questionable root/ roots of a multirooted tooth are removed at the level of furcation keeping the remaining crown and roots intact for function, whereas in Hemisection the entire tooth is divided and the affected part is removed and in Bicuspidization, the crown is equally divided at the center of the furcation, making the furcation area into a more manageable interdental space.[1,2]

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Root amputation and Hemisectionare often valuable procedures once the tooth in question encompasses a high positional worth. The following comprises endodontic indication for root amputation: severe root fracture, undermined furcation areas due to caries, root resorption, root perforation hindering adequate access to the root canal for chemomechanical procedures.[3,4] This article describes a root amputation procedure in mandibular molar.

Case Report: A male patient of age 58 years reported to the Department of Conservative Dentistry and Endodontics with the chief complaint of pain in the lower, left, posterior region, for two months. After a thorough medical and dental history, clinical examination revealed Class II (disto-occlusal) caries in the first molar that extends subgingivally and tooth had mild tenderness on percussion with grade I mobility and furcation involvement. Radiographic examination (Figure-1) revealed, caries extending till the coronal-third of the distobuccal root with vertical bone loss surrounding the distobuccal root and involving the furcation area. The bony support of mesial root appeared intact but radiolucency was seen in the periapical area of mesial and disto-lingual root. So, the diagnosis was primary endodontic lesions with secondary periodontal involvement. The treatment plan was root amputation of

the distobuccal root followed by prosthetic rehabilitation which was informed to the patient and consent was taken.

After administration of local anesthesia, root canal treatment was initiated under rubber dam isolation (Figure-2) and obturation of the mesiobuccal, mesio-lingual, and disto-lingual canals was done followed by access restoration. A mucoperiosteal flap was reflected to expose the distobuccal root, and root amputation was done using a long shank tapered fissure bur with a vertical cut towards the furcation area (Figure-3). The separation was confirmed by passing a probe. A straight elevator was used to luxate and the distobuccal root was removed from the socket (Figure-4-6). Debridement and irrigation with normal saline of the socket were done sufficiently followed by flap repositioning and suturing with 3-0 silk non-resorbable interrupted sutures. Analgesics and antibiotics were prescribed for one week. The patient was recalled after seven days and sutures were removed. The patient was again recalled after a week for crown preparation but as he went out of state and lost communication, the subsequent treatment procedure was never completed.

Discussion

Success of the root amputation is mostly dependent on proper case selection which again depends on various factors such as: Accessibility of root furcation (for easy separation), Adequate bone support for the remaining root, Local factors (tooth anatomy, crown–root ratio, tooth mobility, severity of attachment loss, and occlusal relationships), Patient factors (oral hygiene status and caries index, health and medical status, cost and time) and finally Clinician factors (proper case selection, diagnostic, treatment planning and clinical skill).[5]

In the present case report, root amputation of the distobuccal root was planned as caries had extended sub-gingivally only to involve the coronal third of the distobuccal root along with the furcation involvement, and as it was observed after the removal of the affected root, the remaining structure of the tooth appeared sound clinically as well as radio-graphically along with more than 50% of bone support. Hence a proper prosthetic rehabilitation which was planned, would have been sufficient to reinforce the remaining tooth structure.

The survival rate of root resection therapy as reported by Blomlöf et al, showed 83% survival rate at 5 years dropping to 68% at 10 year recall time, to which the authors stated, even after the diseased root being removed, this procedure inadvertently create a weak zone for aggravating factors such as caries and overhanging restorations to affect these resected teeth and cause further breakdown.[6] Ruiz et al in his study found endodontically treated teeth with periodontal disease to possess a high risk of developing apical periodontitis than teeth without periodontal disease.[7] Therefore a multirooted teeth with more than 50% of bone support around the remaining roots after root resection has a higher chance of survival compared to teeth with less than 50% bone support.[3]

Root fracture is found to be the most common cause of failure after root resection procedures and to reduce the incidence of fractures, sufficient rehabilitation with indirect coronal restoration has proven to have a positive effect on fracture resistance of such root-resected teeth. (8) In certain cases, the survival of these resected teeth can be enhanced by including them as a bridge abutment or splinting them to the adjacent teeth.

Even though root amputation, hemisection, bicuspidization is a successful treatment option in cases where furcation involvement is seen, it is associated with disadvantages as well. The surface of the root that are grinded in the furcation area are more susceptible to caries if not restored subsequently.[5] In the current case report, the tooth might have failed as the patient did not follow up for the prosthetic part of treatment showing his part of negligence making the overall treatment unsuccessful.

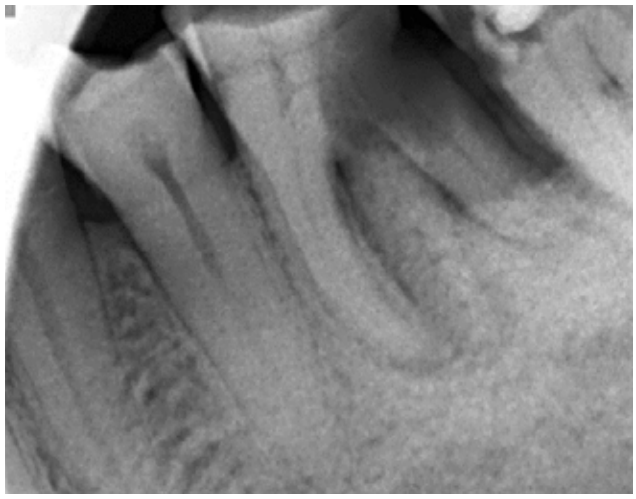

Figure 1. Pre-operative IOPA of 36

Figure 2. Root canal treatment under rubber dam isolation

Figure 3. Mucoperiosteal flap reflected to expose the disto-buccal root and orientation of tapered fissure bur towards the furcation area before root amputation

Figure 4. Disto-buccal root was removed from the socket with a straight elevator

Figure 5. Extracted disto-buccal root

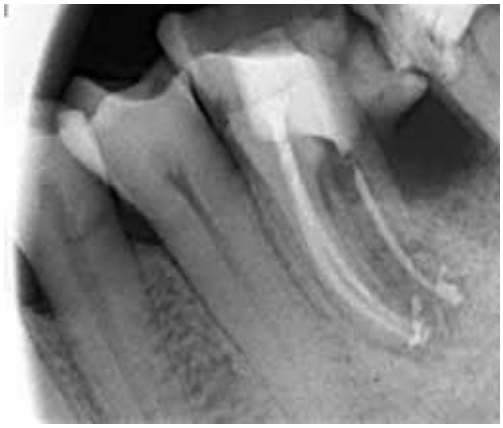

Figure 6. IOPA of 36 Post extraction of Disto-buccal root

Conclusion

Management of teeth with endodontic as well as periodontal problems has always been a challenge to the clinicians. Endodontic, surgical, and restorative work implemented over some time has proven to increase the longevity of such mutilated teeth. And at last, it will be futile if the patients are not informed well about the comprehensive treatment plan and the significance of each step, before initiating the treatment, as they need to give time and be patient, which is the key to the success of the treatment.

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Ethical Permission: Approved

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