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Root amputation: From hopeless to hope

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***Abstract*---**Decision making in endodontic failure tooth between resective procedure or extraction with implant is still challenge for clinicians. The rising concern of the patients towards preserving the natural dentition may shift the clinicians towards Root resection, root amputations and hemisection. Proper case selection is the key to success of resective treatment. This case report describe and illustrates one of the treatment option, that is root amputation, in tooth with endodontic failure.

***Keywords*---**Root Amputation, Hemisection, Root Resection.

Introduction

Proper case selection is the key to success of any treatment. Biomechenical, endodontic and periodontal forces are the main reasons to failure of root amputated tooth. Modern advancement in the field of dentistry and increased desire of patients towards retention of natural tooth increased the demand of Root Resective procedure. *Farrar's* proposed that saving part of tooth (if it can be done and if it will be useful to the patients) is better than removing it. If three roots are better than two, then two roots are better than one and one root is better than

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None[4]. Treatment modality for mandibular molars that do not have furcation loss of periodontal origin is root amputation as compared to hemisection.

Case Report

A 16 year old male patient reported to Department of Periodontics, JCD Dental College, Sirsa, with chief complaint of pain in lower left back region of jaw since 2 months. Pain was sharp and intermittent in nature, which aggravated on mastication and subsides on medication. He also complained of occasional swelling & pus discharge in the same. No extra oral abnormality was detected. Intraoral examination revealed that a sinus on the gingva near furcation area of first left mandibular RCT treated molar. The overlying mucosa was red and shiny. The tooth was tender on percussion and left submandibular lymph node was palpable. Dental history showed RCT of the first mandibular molar 6 months back with crown placement, 4 months after patient noted pain and abscess. Radiograph revealed radiolucency at furcation area as well on the apical aspect of mesial root, file separation was recorded on the middle third of the mesial canal. The ideal treatment was extraction of tooth followed by replacement, but patient was reluctant to lose the tooth and keen on saving. To these reasons and according to aim of prosthetic rehabilitation which is preservation of teeth structure, single crown restoration was considered for patient. So treatment plan was modified to root amputation, whose risks was explained to the patient with his consent.

The first appointment included removal of the existing crown with drainage of pus and antibiotic regime. Second visit included endodontic access to the mesial roots. After failure of file retrival the patient was scheduled for root resection and removal of the mesial roots. Under local anesthesia 1:200000, full thickness flap was reflected with vertical incisions on buccal aspects of tooth. After reflection surgical site was de granulated and mesial roots were sectioned from the dome of furcation with carbide bur. Mesial canal orifice was sealed with MTA and defect site was filled with autogenous osseous coagulum graft with PRF membrane. After this, flap was repositioned and sutured with 3-0 black silk and periodontal pack was applied. Augmention 375mg (t.i.d) and metronidazole 200 mg (t.i.d), Ibuprofen 400 mg (b.d.) was prescribed for 5 days and was asked to continue with the 0.2% chlorhexidine. Sutures were removed after 14 days with no post operative complications. The temporization was done after 4 week later so that surgical site was allowed to heal with no occlusal stress. The patient was recalled on 1,3,6,9,12,18 months. The buccal sinus tract did not reoccur and the tooth showed no clinical signs/symptoms of recurrent infection or inflammation. Radiographic examination on follow up revealed complete healing of the periapical lesion.

Discussion

According to AAP conference in 1998 root amputation is characterized as removal of root without removal of the overhanging portion of the crown. It is technique sensitive procedure. Success of root amputation procedure requires a careful multidisplinary approach with equidistant time gaps. In this case extraction and replacement with implant was another treatment option. But considering the patient's age, periodontal status of the molar, divergence of root, location of the

furcation and patient's financial constraints and desire to retain natural tooth, treatment plan was shifted towards the root amputation procedure. Mesial root is more difficult to prepare because its concavity is towards the distal.[2] Therefore, mandibular molar, mesial root is often subjected to resection and it is maintained in literature. In present case autogenous grafts and PRF membrane have been utilised to fasten the soft and hard tissue healing.

Autogenous grafts is Gold standard as it had osteogenesis, osteoinductive as well as osteoconductive properties[2,3]. The rationale behind the use of PRF membrane lies in fact that the platelet α granules are a reservoir of many growth factors (platelet–derived growth factors, transforming growth factor β, vascular endothelial growth factor and epidermal growth factor) that are known to play a crucial role in hard and soft tissue repair mechanism. It permits a rapid angiogenesis and easier remodelling of fibrin in a more resistant connective tissue[1,8]. In short both regenerative materials were used for soft as well as hard tissue fast healing. No mobility was noted immediate after surgery and on suture removal. After 4-week temporisation was done to prevent the destructive forces to crown which prevent wound healing of soft and hard tissue.

During prosthesis making no occlusal contact should exist in eccentric movement and broad and strong proximal contact should be provided to prevent destructive forces and proper oral hygiene maintanence[7]. After 9 months follow up, radiograph showed adequate bone support for permanent prosthesis with supragingival margins. Supragingival margin is favorable[6], too provide sufficient retention and proper emergence profile, margins should be placed subgingival, but not too much. In the case, the smaller size of the occlusal table is a determining factor in the survival of restoration in root resected tooth that why we was used stainless crown[5]. Further, 9 month (total 1.5 year) follow up after placement of fixed prosthesis no evidence of clinical and radiographic sign and symptoms were noted, fulfilling patient functional and demands.

Conclusion

Proper Case selection and well-designed treatment plan was the key of long-term final outcome of root amputation procedure. With predictable results and high success rate of root amputation, it should be considered as another weapon for dentist to offer patients to retain and not to compromise their natural structure teeth. It provides both conservative and functional goals to the patient.

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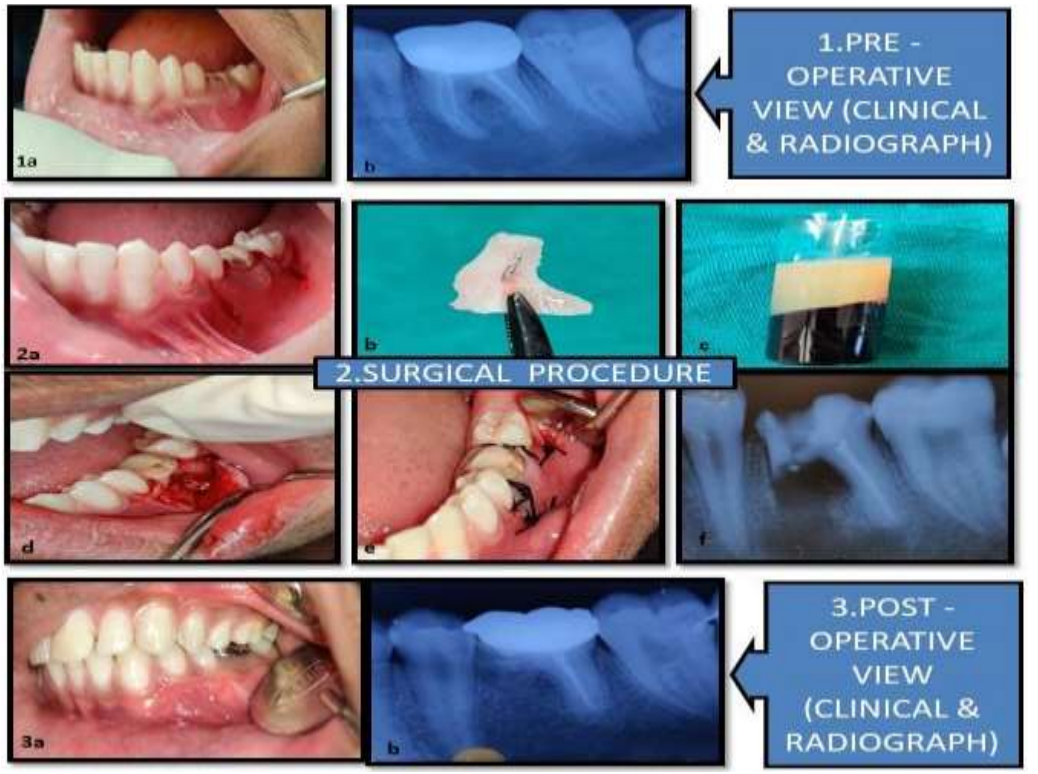
Case Representation:



1a Clinical photograph showing sinus formation near furcation area of mandibular molar.1b-Radiograph images showing short gutta percha and file separation in the mesial root and radiolucency at root apex. 2a Incision, b- Sectioned root, c PRF, d Removal of granulation tissue and site is packed autogenous graft and PRF membrane,e-Suturing,f-Immediate postoperative radiograph after surgery.3a- Clinical post operative images no sign of inflammation,3b Radiograph showing adequate bone formation.