

Management of root resorption in maxillary first molar- radectomy

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ABSTRACT

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INTRODUCTION

The tooth, its pulp, and its supporting structures must be viewed as a biological unit. The interrelationship among these structures influence each other during health, function and diseases.¹

Pulp tissue succumbs to degeneration by way of a multitude of insults, such as caries, restorative process, chemical and thermal insults, trauma and periodontal disease. When products from pulp degeneration reach the supporting periodontium, rapid inflammatory responses can ensure that are characterized by bone loss, tooth mobility and sometimes sinus tract formation.

Periodontal disease by contrast, is a slowly progressive disease that may have a gradual atrophic effect on dental pulp resulting from dental plaque accumulation on external tooth surface.²

Simultaneous existence of pulpal problems and inflammatory periodontal disease can complicate diagnosis and treatment planning and affect the sequence of care to be performed.³ The relationship between the periodontium and the pulp was first discovered by Simring and Goldberg in 1964.⁴

Preservation of tooth is one of the major goals of an Endodontist. This goal can be acquired either by non surgical or surgical approach. Root resection is one of the surgical approaches for preservation of molars with furcation involvement. This procedure results in a unique environment which is dictated by the contours of the remaining roots and the residual furcation between them. Root resorption is a viable treatment option to salvage and retain a part of multirrootedteeth. This case report illustrates prognosis of root resection after completion of endodontic therapy for managing a case of root resorption. This case shows external root resorption of the distobuccal root of right maxillary first molar. Due to strategic value of maxillary first molar, it was decided to employ root resection. After completion of endodontic therapy root resection was carried out. After 6 months, the absence of periradicular radiolucent lesions, periodontal pocket, pain, and swelling indicated a successful outcome of root resection.

Keywords: Endodontist, Multirrooted teeth, Periradicular, Distobuccal, Resorption

Periodontium is anatomically interrelated with the dental pulp by virtue of apical foramina and lateral canals create pathways for exchange of noxious agents between the two tissue compartments. Lesions of the periodontal ligament and adjacent alveolar bone may originate from infections of the periodontium or tissues of dental pulp.⁵

Resorptive processes involving the root surface, and treatment measures aimed at managing periodontal disease enhance this potential as the accompanying exposure of dentinal tubules establishes passage across the body of the tooth structure. Hence, inflammatory symptoms often seen as typical of periodontal disease including deep periodontal pockets with or without swelling and supuration of the marginal gingiva, increased tooth mobility and angular bony defects may also represent symptoms of a pathological condition present in the root canal system of the affected tooth.⁶

The management of molar teeth exhibiting furcation involvement has always been a challenge to the dentist and usually involves combining restorative dentistry, endodontics and periodontics so that the teeth are retained in whole or in part.

Root resection has been widely used successfully to retain teeth with furcation involvement as well as roots exhibiting resorption and loss of periodontal apparatus. It is important to consider the factors such as angulation of the tooth, length and curvature of roots, bone support of retained roots/root before deciding to undertake any root resection procedure.⁶

In this case report amputation of distobuccal root of maxillary first molar is presented. Root resection

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therapy is said to be a treatment option for molars with periodontal, endodontic, restorative or prosthetic problems. It is mentioned that commonly sighted indications for root resection are severe bone loss, class II or class III furcation involvement, severe recession or dehiscence, inability to fill a canal, root fracture, root resorption, and root decay. In a maxillary molar, root resection therapy can be used when attachment loss, caries or a fracture involving furcation area.⁷

Root resection can be an alternative treatment in a molar tooth having endodontic-periodontal problem such as true combined lesion where root resection may allow changing the root configuration of the part of the tooth to be saved.⁸

CASE REPORT

A 26 year old female patient reported to the department of Conservative dentistry and Endodontics, Seema Dental College and Hospital, Rishikesh, with the chief complaint of food lodgment and pain in right maxillary posterior teeth. On examination it was found that gingival recession was present in relation to distobuccal root of left maxillary first molar, along with furcation involvement.

Detailed history revealed that patient used abrasive tooth powder for cleaning teeth for last four years which resulted in gingival recession and periodontal involvement causing bone loss. Tooth was nonvital and did not show any response to thermal and electrical pulp vitality tests.

On radiographic examination (Fig-1), root resorption was visible in case of distobuccal root of maxillary and (periodontal) bone loss was visible all around the distobuccal root where the mesiobuccal root and palatal root were healthy. Grade I mobility was seen in maxillary first molar.

Phase I therapy was carried out which included thorough scaling, curettage, root planning. The tooth was prepared for endodontic treatment. After administering local anesthesia rubber dam application was done. Access cavity was prepared, working length was established and biomechanical preparation was carried out after locating the two mesiobuccal, distobuccal and the palatal canal. After complete disinfection of the root canal system, obturation was carried out in the mesiobuccal and palatal canals. This was followed by post endodontic restoration of silver amalgam.

After 10 days of completion of root canal treatment under coverage of local anaesthesia, a full mucoperiosteal flap was raised in relation to maxillary right molar. (Fig-2)

The furcation area was cleaned and identified by passing a needle through the buccal trifurcation and distobuccal root was resected by making horizontal cut (from distal part up to the furcation area).

Resection of distobuccal root was carried out using vertical cut method.⁹ (Fig-3) Furcation area was slightly trimmed to ensure that no residual debris remained. Contouring was done to make it a self cleansing area. The occlusion was checked to eliminate any discrepancy and minimize the occlusal load. (Fig-4,5)



Fig. 1: Preoperative



Fig. 2: Flap reflection



Fig. 3: Root Resection



Fig. 4: Resected Distobuccal Root



Fig. 5: Postoperative

DISCUSSION

The terms “root amputation” and “hemisection” are collectively called as “root resection”.¹⁰ Root resection involves removing one or more roots of the tooth to maintain the functioning of the rest of the tooth. Root resection is dependent on selection of the tooth. According to Newell the advantage of the resection is the retention of some or the entire tooth.¹¹ Success of root resection procedures depends, to a large extent, on proper case selection. It is important to consider the factors such as angulation of the tooth, length and curvature of roots, bone support of retained root and feasibility of endodontics and restorative dentistry in the root/roots to be retained; before deciding to undertake any of the root separation and resection procedures.⁶

Root-resection therapy is a treatment option for molars with periodontal, endodontic, restorative, or prosthetic problems.¹² Because root resection is very technique sensitive and complex, proper case selection is essential.¹³ The prognosis of root resection has been well documented in previous studies. According to the standardized reports on 11 root resection of Buhler, 89% of root resected teeth survived over a 7-year period. However, Carnevale et al reported a 6.9% failure rate over a 10- year period. In a limited meta-analysis using common denominators of time of observation and criteria of failure as 12 defined by Langer et al, Buhler reported that the failure rate for teeth treated by root-resection, over a seven-year observation period, was 11%.

Root resection has been used successfully to retain teeth with furcation involvement. The disadvantage being the root surfaces in the furcation area become more susceptible to caries. Often a favorable result may be negated by decay after treatment, failure of endodontic therapy due to any reason and occlusal discrepancies involving the prosthesis to name a few. The prognosis of root resection is same as for routine endodontic therapy provided that the root resection is of acceptable design. With recent advancement in endodontics, periodontics and restorative dentistry, root resection has received renewed acceptance.

Traditional wisdom was based on the concept of trying to save the tooth by all means necessary. However with inception of dental implants, a completely new avenue has been opened in the treatment planning process.

This has created a new debate. Some advocate the traditional approach while others have adopted a more aggressive approach and prefer to extract and replace a compromised tooth with an implant restoration.

CONCLUSION

Root-resection therapy is still a valid treatment option for molars with furcation involvement and severe bone loss. Root resection should be considered as

another weapon in the arsenal of the dental surgeon, determined to retain and not to remove the natural teeth.

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