**CASE REPORT**

**SURGICAL MANAGEMENT OF APICOMARGINAL DEFECT IN MANDIBULAR MOLAR WITH GRADE II MOBILITY: A CASE REPORT**

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**ABSTRACT:**
Treatment of advanced periodontal breakdown as a result of endodontic lesion is a challenge for the practitioner. Guided tissue regeneration (GTR) is an established treatment option in such cases, along with endodontic surgery. A few recent studies have reported favorable outcome for treatment of apicomarginal defects without using GTR. Such an option helps prevent disadvantages of using barrier membrane. This case report presents favorable outcome of a mandibular molar with large periapical pathology and apicomarginal defect and grade II mobility treated by endodontic surgery without using GTR.

**Key words:** Surgical endodontics, apicomarginal, GTR.

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**INTRODUCTION:**
The prime objective of endodontic treatment is to return the diseased tooth to a state of health and function. (1) Most of the time teeth with periapical lesions heal satisfactorily after non-surgical endodontic treatment. (2) However, failure after conventional root canal treatment calls for surgical intervention in order to remove the pathological tissues and to eliminate the source of irritation, which could not be removed by the orthograde root canal treatment. (3) Generally, the success rate of apicoectomy and retrograde fillings is 50% to 70%. (4) When the bony destruction by the pathologic process includes the buccal cortical plate, prognosis of the periapical surgery decreases to 27% to 37%. (5, 6)

An apicomarginal defect can be defined as a total loss of the buccal bone plate extending from crestal bone to the apex of the tooth. (7) These defects are reported to have diminished prognosis following periapical surgery. (8) This decreased prognosis in such defects is due to downgrowth of epithelial tissue along the root surface. (8) The treatment of endodontic-periodontal combined lesions such as apicomarginal defects requires both endodontic therapy and periodontal regenerative procedures. Guided tissue regeneration (GTR) is an established treatment option for the management of these defects. (9) However, regeneration using GTR membrane possess disadvantages like high cost, possibility of contamination, difficulty in proper flap approximation, and also a greater risk for mechanical trauma resulting in micro endo-perio communications (possibility of infection). (9) A membrane barrier might actually prevent osteoprogenitor cells in the periosteum from proliferating into the bone defect to help new bone formation. (10) Two studies have reported high success rates of treatment of apicomarginal defects without using GTR techniques. (11, 12)

This case report presents the successful management of apicomarginal defect in left mandibular first molar by combined nonsurgical and surgical approach without GTR.

**CASE REPORT:**
A 25-year-old male was referred to the Department of Endodontics, Post Graduate Institute of Dental Sciences with a chief complaint of pus discharge and pain in left mandibular region. The patient was systemically healthy and medical history was non contributory. Root canal treatment was initiated by the referring dentist one month back, with no resolution of symptoms after two visits. Extra oral examination revealed no sign or symptom. Intraoral examination revealed temporarily restored left mandibular first molar. Palpation of mucosa around the apex produced pain, and purulent exudate from the buccal gingival sulcus of the tooth. Tooth was not tender to percussion. Periodontal probing revealed isolated narrow, deep pocket in mid buccal region of the tooth (Figure 1). Tooth exhibited grade II mobility. Thermal and electric pulp tests yielded negative results for left mandibular first molar. Periapical radiograph showed a large periapical radiolucency associated with both the roots. Non surgical endodontic treatment was planned for the left mandibular first molar. The tooth was accessed under rubber dam isolation and was found to be necrotic. Root canal preparation was done with ProTaper rotary instruments (Dentsply, Maillefer, Switzerland), accompanied with copious irrigation using 3% sodium hypochlorite between the instruments. Apical patency was maintained using #10 K file, 1mm beyond the working length. After
chemomechanical preparation, a calcium hydroxide dressing was placed, and patient recalled after 1 week. The symptoms did not resolve after one week and a triple antibiotic paste dressing was given for further disinfection. After 3 weeks, pus discharge from the sulcus ceased, but the root canals still had exudation and could not be dried. So a decision to treat the tooth surgically was taken and periapical surgery was planned.

All surgical procedures were done under an operating microscope (Moller Denta 300; Haag Streit International, Koniz, Switzerland) except incision, flap elevation, and suturing. Following administration of local anaesthesia, a full thickness mucoperiosteal flap was reflected (Figure 3). All granulomatous tissue was removed to allow complete visualization of the defect. Complete loss of the cortical plate was seen on the facial aspect of the first molar (Figure 4). Apical 3mm of both mesial and distal roots were resected and retro preparations were done with ultrasonic tips. Retrograde filling was done with mineral trioxide aggregate (MTA). The mucoperiosteal flap was sutured in place and a periapical radiograph was taken (Figure 5). Patient was instructed regarding the postoperative care and kept under antibiotic coverage along with 0.2% chlorhexidine gluconate solution as mouth rinse for a period of 5 days. Suture removal was done after 7 days, and the patient was periodically reviewed after 3 months, 6 months, and one year. Patient was asymptomatic during one-year follow-up. At one-year follow-up, the periapical radiograph confirmed satisfactory healing of the lesion (Figure 6). A 4 mm periodontal pocket was present on the mesiobuccal aspect of the tooth at one year follow up. Scaling and root planning was done and the patient was put on follow up.
DISCUSSION:
Presence and size of periapical lesion influence the success of both primary and secondary root canal treatment. Large periapical lesions may persist after root canal treatment because of more bacterial diversity. They also are indicative of long standing infections in which microbes may have penetrated deep into dentinal tubules or to peripheral aspects of root canal system. This makes removal of such microbes and biofilms even more difficult by routine non surgical root canal treatment. On the other hand, large lesions may also persist in case of extra radicular infection and true cyst formation, both of which cannot be eliminated by non surgical root canal treatment. Sinus tract may also facilitate influx of bacteria from the oral cavity which can colonize the periapex and result in extra radicular infection.

The goal of periapical surgery is to remove all pathologic tissues from the surgical site, to completely seal the entire root canal system, and to facilitate the regeneration of hard and soft tissues including the restoration of attachment apparatus. In present case 12 month follow up radiograph showed significant periapical bone fill. These results corroborate with previous studies which reported high success rate (>60%) in apicogingival defects without using GTR technique. The results observed in present case can be attributed to the microsurgical technique employed for management of the present case. One of the major limitations of traditional surgical methods is the inability to optimally manage the resected root surface, leading to incomplete sealing of the infected root canal system. On the other hand high magnification provided by microscope enables the clinician to accurately detect details of the canal anatomy after apicoectomy. In addition, the use of ultrasonic instruments for retroreparation resulted in conservative, coaxial root-end preparation, which was then sealed with biologically acceptable root-end filling material (MTA) and was able to satisfy the requirements for mechanical and biologic principles of endodontic surgery. Another factor which determines healing is morphology of defect. Lesions that solely involve buccal surface are reported to have favorable prognosis as compared to lesions with bone loss in proximal region. This case is a Class I, type 3 apicogingival defect where the infection is confined to the tooth treated. These types of lesions are reported to have high success rate following endodontic surgery. The ‘apical seal’ has long been considered paramount to the success of periradicular surgery. Many materials have been used for apical sealing including reinforced zinc oxide-eugenol cement, amalgam and MTA but MTA exhibited significantly less inflammation, more cementum formation and regeneration of periradicular tissues when used as retrofilling material. Hence, MTA was used to fill retro preparations in present case. Calcium hydroxide was used as intracanal medicament in this case as it is bactericidal and neutralizes the remaining tissue debris in the root canal system. Furthermore, it mediates the neutralization of lipopolysaccharides and thus helps in disinfecting the root canal. Despite of successful resolution of signs and symptoms and favorable radiographic healing at follow up, this case report has a limitation of short follow-up period of 12 months. Also, the use of advanced imaging techniques like cone beam computed tomography would have helped to more accurately assess the post treatment periapical healing.

REFERENCES:

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