INTRODUCTION

The major goals of root canal treatment are to clean, shape and seal the root canal in three dimensions to prevent re-infection of the tooth. Although the initial root canal therapy has been shown to be a predictable procedure with high degree of success, failures can occur. Lack of healing is attributed to persistent intraradicular infection as well as extraradicular causes. Studies have shown that orthograde re-treatment for previously treated cases with various forms of gutta-percha followed by surgical endodontics produces higher success rate than retreatment alone. The avoidance of surgical treatment by using conservative treatment options that have similar prognostic outcomes should be considered. Monoblock obturation in re-treatment cases offers an alternative method that can possibly reduce the indications for endodontic surgery. Mineral trioxide aggregate (MTA) may have profound advantage when used as canal obturation material because of its superior physiochemical and bioactive properties. MTA fulfills the ideal requirements of being bacteriostatic, although may show potential bactericidal properties. The unique sealing property combined with an initial high pH, may provide suitable mechanism for bacterial entombment, neutralization, and inhibition within the root canal system.

MTA Monoblock Obturation Technique in Endodontic Retreatment

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ABSTRACT

A 48-year-old male patient presented to the Department of Endodontics for evaluation of right first permanent molar, which had received non-surgical root canal treatment two years ago and was restored with core material. The presenting symptoms included swelling in the buccal vestibule and pain overnight. Clinical examination demonstrated that the mandibular right first molar was sensitive to percussion and also showed fluctuant swelling in the vestibule proximal to the molar and mild mobility. Radiographic examination revealed a poor quality obturation of the mesial and distal root, distal root resorption, extensive periapical and furcation radiolucency and bone loss. A diagnosis of acute periapical abscess of the mandibular right first molar was made. Tooth was treated non-surgically by the manual application of MTA in the root canal. Follow-up evaluation was performed at one year after the treatment. Clinically, treatment was considered successful due to the absence of clinical signs, symptoms and radiographic appearance with substantial reduction (more than 50%) in the diameter of the periapical radiolucency. Mineral trioxide aggregate monoblock obturation technique appears to be a valid technique to obtain periradicular healing in re-treatment of previously root canal treated teeth with periapical lesion.


CASE REPORT

A 48-year-old male patient was presented to the Department of Endodontics of the College of Dentistry, Ziauddin University, Karachi, Pakistan for evaluation of right first permanent molar, which had received non-surgical root canal treatment two years ago and was restored with core material. The presenting symptoms included swelling in the buccal vestibule and pain overnight. Clinical examination demonstrated that the mandibular right first molar was sensitive to percussion and also showed fluctuant swelling in the vestibule proximal to the molar and mild mobility. Radiographic examination revealed poor quality obturation of the mesial and distal root, distal root resorption, extensive periapical and furcation radiolucency and bone loss. A diagnosis of acute periapical abscess of the mandibular right first molar was made. Tooth was treated non-surgically by the manual application of MTA in the root canal. Follow-up evaluation was performed at one year after the treatment. Clinically, treatment was considered successful due to the absence of clinical signs, symptoms and radiographic appearance with substantial reduction (more than 50%) in the diameter of the periapical radiolucency. Mineral trioxide aggregate monoblock obturation technique appears to be a valid technique to obtain periradicular healing in re-treatment of previously root canal treated teeth with periapical lesion.
The working length was measured radiographically with a K-file and recorded. The canals were dried with sterile paper points and filled with calcium hydroxide (Ultracalx Ultradent, USA) placed using intracanal Capillary Tips (Ultradent Inc.), and the access cavity was sealed with Cavit (3M ESPE, Asia). After one week, the calcium hydroxide was removed by rinsing with alternating solutions of NaOCl 5% and EDTA 17% (META). A final rinse with sterile water was performed. Once the canal was dry at the working length, with no exudates, the full canal was filled with MTA (Dentsply Tulsa).

Mineral trioxide aggregate was mixed, as recommended by the manufacturer and the whole canal was filled by using hand Lawaty technique, rather than by ultrasonic condensation. The amalgam gun, locally modified hand and finger pluggers and K-file with flat end were used for MTA placement and adaptation. Correct placement of MTA was confirmed radiographically. At the next appointment, the access cavity was sealed and the tooth was restored with dentine and enamel-bonded composite. Case was evaluated radiographically using the paralleling technique at the first visit, after the filling of the full canal with MTA and coronal restoration at the 12 months follow-up appointments. The treatment was considered successful as clinically, there was no signs and symptoms such as pain, swelling or tenderness to apical and gingival palpation or percussion. Radiographically there was substantial reduction (more than 50%) in periapical radiolucency (Figure 2).

**DISCUSSION**

The current challenge in endodontics has been the retreatment of previously treated cases associated with refractory disease. There are different treatment options. Previously treated teeth with persistent periapical lesion(s) might be preserved with non-surgical retreatment or endodontic surgery.

Different factors have been reported for failure initial root canal treatment. However, in this particular case, inadequate shaping, cleaning and defective apical and coronal seals were the responsible factors.

The previous root canal treated teeth with persistent periapical lesion(s) have also been treated with different techniques and materials. In this case, non-surgical root canal treatment was performed and canal was obturated with MTA monoblock which illustrates the concept of MTA obturation of the entire canal system. Consistent with this case report, the previously non-surgical successful re-treatment of teeth with periapical lesion has been presented by using MTA monoblock obturation technique and MTA obturation coupled with surgical root resection.

In the present case, there was an extensive periapical and furcation radiolucency as well as bone loss. It has been shown that intracanal application of MTA can cause release of calcium ions through dentinal tubules into the external area, which may favour the repair potential of the surrounding tissues. These factors are important when considering non-surgical treatments in cases presented with refractory endodontic disease diagnosed for re-treatment.

The case report was recalled at 12 months follow-up and radiographically there was substantial reduction (more than 50%) in the diameter of the periapical radiolucency. Although complete healing did not occurred, the patient was asymptomatic with the tooth exhibiting normal sulcular probing depth, mobility, and function. The orthograde retreatment with MTA monoblock proved to be very conservative as it led to avoidance of surgical treatment with similar prognostic outcomes. However, longer follow-up is required for this case. The orthograde retreatments with MTA might provide comparable rates and lesser morbidity when contrasted against conventional retreatments.

Further studies are necessary to provide more information about the use of MTA monoblock obturation for non-surgical retreatment of previously root canal treated teeth with periapical lesion.

**REFERENCES**


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