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Intractable treatment of inflammatory internal root resorption by fortifying with mineral trioxide aggregate and fibre post

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ABSTRACT

This article describes a case report where mineral trioxide aggregate (MTA) and fibre post were used for nonsurgical endodontic management of internal root resorption in a 53-year-old woman. Internal resorption is a relatively rare phenomenon leading to destruction of intraradicular dentine and dentinal tubules. Thorough cleaning and shaping of the root canal space and the resorptive defect was achieved by mechanical instrumentation, irrigation, and interim calcium hydroxide dressing. The root canal apical to resorptive defect was obturated with gutta percha, whereas resorptive defect was reinforced using MTA and fibre post. Follow-up intraoral periapical radiographs at 18 months showed adequate repair of the resorption and the tooth remained asymptomatic.

1. Introduction

According to the Glossary of the American Association of Endodontists, resorption is defined as a condition associated with either a physiologic or a pathologic process resulting in loss of dentine, cementum or bone. Predisposing factors include trauma, chronic infections of pulp or periodontium and orthodontic forces.[1]

The ultimate goal of treatment is complete removal of the infective pulp and resorptive tissue from the root canal. If there is extensive loss of tooth structure, choosing apt restorative materials remain a challenge.

MTA is a competent material with its properties like sealing ability, strength, biocompatibility and tissue regeneration capability. These properties of MTA have been accredited to the production of hydroxyapatite when the calcium ions released by the MTA come into contact with tissue fluid.[2]

The present case report describes the 18-month follow-up of extensive internal inflammatory root resorption in a maxillary central incisor, where MTA and a fibre-glass post, were employed to restore function.

2. Case report

A 53-year-old female patient presented with a chief complaint of discoloration affecting maxillary central incisors. The medical history was non-contributory. Patient revealed history of trauma approximately 25 years earlier, involving a direct impact on maxillary anterior teeth.

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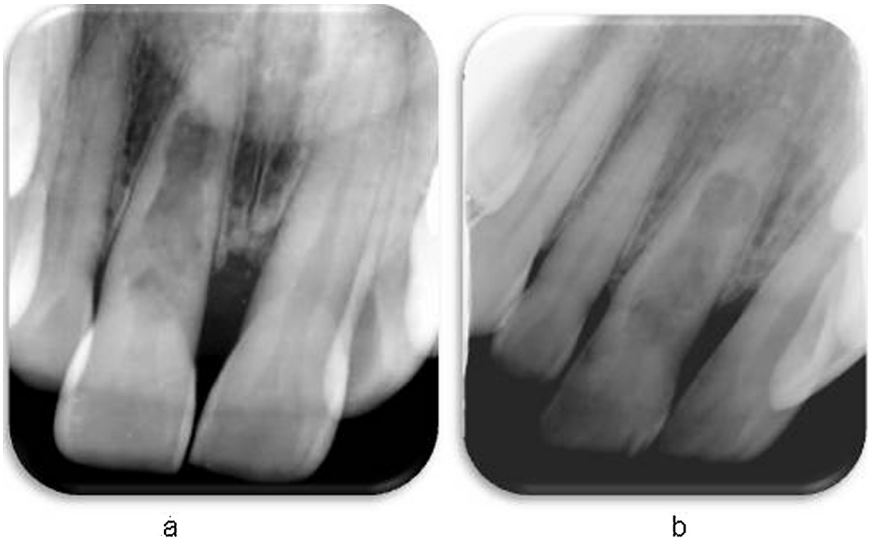

Fig. 1 – (a and b) Preoperative periapical angulation radiographs: extensive internal root resorption in maxillary right central incisor

No episode of pain was reported by the patient and on clinical examination, teeth number 11 and 21 showed discoloration. Thermal and electrical pulp testing with cold test (Endo-Frost, Roeko, Langenau, Germany), heated gutta-percha and electric pulp tester (Parkell, Edgewood, NY, USA), respectively, elicited a negative response.

A periapical radiograph revealed an apparent radiolucency in the middle and coronal third of the root canal which is ragged in outline in tooth number 11. Lesion appeared close to canal even if angulations of radiograph changes suggestive of extensive internal root resorption (Fig. 1a and b). The diagnosis was inflammatory non-perforating internal resorption in 11 and Ellis class IV fracture in 21.

The treatment plan was root canal treatment followed by reinforcing resorption area using MTA and fibre post in 11 and root canal treatment in 21. A full veneer crown was indicated as final postendodontic treatment plan.

Informed consent was obtained from the patient and access cavity preparation was done under rubber dam isolation. The canal was negotiated and as the resorption defect was in close proximity to external root canal wall, ultrasonic passive irrigation was done for gentle debridement. Working length was determined (Fig. 2) and biomechanical preparation was done using stainless steel K files to a master apical file size 35 (Dentsply Maillefer, Ballaigues, Switzerland) under 3% sodium hypochlorite irrigation. The canal was dried with paper points and calcium hydroxide was mixed with 2% chlorhexidine gluconate (Neelkanth Healthcare Pvt. Ltd, Safe Plus, Rajasthan, India) to form a paste and placed in the canal using a lentulo spiral to the working length. The access cavity was filled with a temporary restorative material, IRM (Dentsply, Caulk, USA).

In the next visit, calcium hydroxide dressing was flushed out using alternating irrigation with 5.25% NaOCl and 17% EDTA. The canal was irrigated with final rinse of 2% chlorhexidine gluconate and was dried using paper points. Platelet rich fibrin membrane was prepared using the procedure described by Dohan et al. The PRF membrane was cut into two halves and was introduced into the resorption defect and gently compacted using hand pluggers under an operating microscope (Carl Zeiss Inc, Oberkochen, Germany).

In the next visit, master cone was selected and sectional obturation was done using gutta-percha and AH-Plus sealer (Fig. 3). One gram of MTA powder (MTA-Angelus, Londrina, Brazil) and 0.33 g of distilled water were mixed, and the MTA slurry was introduced into internal portion of resorbed space. Then fibre post was inserted into the canal to preserve the original root canal space (Fig. 4) and temporarily restored.

Fig. 2 – Periapical radiograph showing working length determination.

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