Management of a Perforating Internal Resorptive Defect with Mineral Trioxide Aggregate: A Case Report

Ehsen Abdelmoumen*, Sonia Zouiten Skhiri**, Abdelatif Boughzela#

* Post graduate student, Department of Conservative Dentistry and Endodontics, Faculty of Dentistry of Monastir, Tunisia ** Professor, Department of Conservative Dentistry and Endodontics, EPS Farhat Hached-Sousse, Tunisia # Professor, chief department of dental medicine, EPS Farhat Hached-Sousse, Tunisia.

Address for correspondence: Ehsen Abdelmoumen, Faculty of dentistry of Monastir, department of conservative dentistry and endodontics, Street Avicenne 5000 Monastir

Telephone No.: +216 98383315

Email: dr.ehsen@hotmail.fr

Abstract: Internal root resorption is a chronic inflammatory process initiated within the pulp space with the loss of dentin along the middle and apical thirds of the canal walls as a result of clastic activities and is generally found in teeth with previous history of trauma. It is important to diagnose this condition and institute treatment as early as possible to improve the prognosis of such teeth. The use of biocompatible materials like mineral trioxide aggregate (MTA) may improve the prognosis of teeth with root perforation. This paper reports a clinical case of perforating internal root resorption treated surgically with MTA.

Keywords: calcium hydroxide, internal resorption, mineral trioxide aggregate, root perforation, surgery.

INTRODUCTION

Internal root resorption is a relatively rare resorption of dentin which starts in the pulpal cavity or in the root canal and destroys surrounding dental hard tissues. The initiating factor in internal root resorption is thought to be trauma or chronic pulpal inflammation, but other etiological factors have also been suggested like caries, pulpitis, plup capping with calcium hydroxide, cracked tooth, excessive heat generated during restorative procedures on vital teeth, orthodontic treatment (3,2,1,6,11). The progression of the resorption phenomena can cause the perforation of the root and the tooth structure been compromised. (1,2, 3, 5, 6, 7). Clinically, internal root resorption is usually asymptomatic and is detected coincidently through routine radiographs or by the clinical sign of the crown with pinkish color known as ‘pink spot’ occurs late, when integrity of crown has been compromised. (1, 2, 3, 5, 6, 7, 9).

Radiographic examination usually reveals a fairly rounded uniform radiolucent area. It appears as an expansion of the pulp chamber or canal and pulp chamber. (1,4,6,7)

The prognosis for treatment of small lesions of internal resorption is good.

However, if the tooth structure is greatly weakened and perforation has occurred, the prognosis is poor and tooth extraction must be considered.

After considering the differential diagnosis, including external root resorption, treatment ust aim at complete extirpation of the pulp...
which stops the internal resorption process, in an attempt to prevent further loss of hard tissue.

The mineral trioxide aggregate (MTA) was proposed by Torabinejad et al and has been used in several applications. It's considered as a favorable perforation repair material with its superior sealing ability, biocompatibility, fibroblastic stimulation, and antimicrobial activity become too weak.(3)

Histopathologically it is characterized by an osteoclastic activity and the presence of lacunae which may be filled in by osteoid tissue, presence of multinucleated giant cells or dentinoclasts. The pulp is usually chronically inflammed and metaplasia of pulp may occur.(6)

**Case report:**

A 48 years-old female patient consulted the department of Conservative Dentistry and Endodontics of University Hospital of Farhat Hached -Sousse Tunisia with the chief complaint of a fistula related to tooth 22. The patient reported a history of dental trauma at the age of 30 at the anterior region and at that time tooth 11 and 21 were crowned. The tooth was treated previously by another praticien.

Clinical examination revealed the presence of fistula. Tooth 22 respond negatively to pulp vitality test with discomfort on percussion. (Fig.1)

**Figure 1:** Fistula reperated with Guttapercha

The diagnosis highlighted that tooth 22 had a fistulizing abscess with a perforating internal root resorption.

The prognosis of the tooth was reserved for the extension and length of the perforation. But cooperation and the intense desire of the patient to keep her tooth motivated us to treat it. After isolation of the tooth with a rubber dam, the access cavity was rectified and the working length was determined by x-ray images. The canal was prepared with Heroshaper® system (Micro Mega-Besançon, France) and irrigated with 2.5% sodium hypochlorite with the purpose of dissolving the necrosis tissues of the concavities in the resorption area. Subsequently, calcium hydroxide was placed as temporary dressing of intracanal medication to alkalinize the environment, remove remaining pulp tissue and control bleeding at the perforation.

After 10 days, the root canal was reentered and irrigated to remove the temporary
dressing. After this, it was filled with thermoplasticized gutta-percha technique (E&Q Wireless™, Meta biomed co, Korea). (Fig.3)

**Figure 3:** Localization of the perforation and remove of the granulation tissue.

An excess filling material was removed from the coronal pulp chamber, which was promptly sealed with a provisional cement. An immediate postoperative radiograph was taken, showing satisfactory filling of the root canal with material extravasations in the perforation area due to the communication between the internal root resorption and the periodontal ligament.

Surgical treatment was necessary because of the seat and extension of the perforation.

A flap that exposed the granulation tissue and the perforation was elevated. The granulation tissue and the excess of gutta-percha was removed. (Fig.4) MM-MTA® (Micro-Mega, Besançon, France) was placed and firmly condensed by using plugger (Fig.5).

Finally, the flap was sutured. At the next visit, the patient reported no postoperative pain or discomfort.

**Discussion:**

Internal inflammatory root resorption is an insidious pathological process, initiated within the pulp space and associated with loss of dentine.

Because resorptive defects are often asymptomatic, they are usually recognized by routine radiograph. (4,10,11)

Once internal root resorption has been diagnosed, the clinician must make a decision on the prognosis of the tooth. If the tooth is deemed restorable and has a reasonable prognosis, root canal treatment must be considered, aiming to arrest the cellular activity responsible for the resorptive activity. (Trope 2002)

The endodontic treatment of teeth with internal root resorption is complicated due to the difficulty in removing the tissue of the resorption cavity (8).
However, the use of ultrasonic instruments to agitate the irrigant (sodium hypochlorite) has been shown to improve the removal of necrotic debris and biofilm from inaccessible areas of the root canal. Complementing the action of the sodium hypochlorite, we use the intracanal medication with calcium hydroxide for a prolonged period. (8,9) The use of calcium hydroxide-based sealer as an antibacterial medicament would improve disinfection of the inaccessible root resorption defects, allow the alkalinity of the environment, control periodontal bleeding and prevent a resorption recurrence. (5,11)

The root canal treatment is followed by obturation of the disinfected canal with an appropriate root-filling material to prevent it from reinfection. The internal root resorption defects can be difficult to obturate adequately. According to Culbreath et al. (2000), the treatment for internal resorption can include several materials such as gutta-percha, zinc oxide eugenol, glass ionomer cement, super EBA amalgam alloy. However, these materials do not provide strength to the tooth structure and may be responsible for considerable tooth discoloration. Gencoglu et al, Goldman et al, concluded that the ObturaII thermoplastic gutta-percha technique performed statistically better in obturating resorptive defects than cold lateral condensation. Thermafil and a hybrid technique. (1,3,7,10,11)

Actually, In situation when the root wall has been perforated, mineral trioxide aggregate (MTA) should be considered the material of choice to seal the perforation. The indication is due to the fact that the biocompatibility of MTA, and its sealing properties in the presence of moisture and even blood are important characteristics that may result in greater success rates when used for treating perforating internal root resorption. (2, 5,11,9)

**Conclusion:**

Root resorption is a complex process. Because it is asymptomatic, internal root resorption needs an early detection and a correct differential diagnosis for successful management of the outcome of internal resorption to prevent overweakening of the remaining root structures and root perforation.

**References:**


