



# INTERNATIONAL SCIENTIFIC MEETING (TINI IV) & IKORGI NATIONAL CONGRESS XI

*Revolutionary Paradigm for the Future Vision  
of Endodontics & Restorative Dentistry*

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# PROCEEDING

## International Scientific Meeting (TINI IV) & National Congress IKORGI XI

Theme :

**Revolutionary Paradigm for the Future Vision of Endodontics and Restorative Dentistry**

**Surabaya, November 3<sup>rd</sup> – 5<sup>th</sup>, 2017**

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## CASE REPORT

# THE CONSERVATIVE MANAGEMENT OF EXTERNAL ROOT RESORPTION OF PERMANENT INCISIVE CENTRAL CAUSED BY A TRAUMA : A CASE REPORT

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### ABSTRACT

**Background:** External tooth resorption usually follows trauma to the periodontal ligament. It is a lytic process occurring in the cementum or cementum and dentin of the roots of teeth. Resorption of cementum is regulated by mechanisms similar to those controlling osteoclastogenesis and bone resorption. **Case:** A 20 year-old male patient reported to departement of endodontic, with the chief complaint of pain in his upper right central incisor. Twelve years ago he got an accident and his upper right central incisor got broken. His gum was often swollen but he never took any medicine. On clinical examination of tooth 11, it was found that his tooth was perforated, tender to vertical percussion and no tooth mobility was seen. The Intraoral periapical radiographic examination of tooth 11 revealed root resorption on the root, associated with periapical radiolucency and some bone loss. **Case Management:** Canal was cleaned and shaped with a brushing movement technique. Then Calcium hydroxide as an intracanal medicament was placed in canal for 2 weeks. The canal was next obturated with MTA on the apical third. After 1 day, the canal was filled using injection termoplastis technique. The tooth was finally restored with fiber post and porcelain fused to metal crown. **Conclusion:** The use of biomaterials, such as MTA in teeth with perforating external root resorption gave optimal results.

**Keyword:** External Root Resorption, Mineral Trioxide Aggregate, Apexification.

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### INTRODUCTION

Etiology of different types of root resorption requires two phases: mechanical or chemical injury to the protective tissue and stimulation by infection or pressure. Injury can be similar in various types of root resorption. The selection

of proper treatment is related to the stimulation factors. Intrapulpal infection is the stimulation factor in internal root resorption and external root periradicular inflammatory root resorption. Therefore, various types of root resorption can be classified according to the stimulation

factors: pulpal infection, periodontal infection resorption, orthodontic pressure resorption, impacted tooth or tumor pressure resorption and ankylotic resorption.

The most common stimulation factor for root resorption is pulpal infection. Following injury to precementum or pre dentin, infected dentinal tubules may stimulate the inflammatory process with osteoclastic activity in periradicular tissues or in pulpal tissues, consequently initiating external or internal root resorption. Clinically, teeth are usually not symptomatic in early period of the process, the resorption may be seen at this stage only in radiographs. However, as the process progresses, the teeth may become symptomatic and periradicular abscesses may develop with increasing tooth mobility. Radiographically, radiolucency is observed in the external tooth surface of dentin and adjacent bone.

External root resorption occurs on the outer surface of the root and the causes for this may vary. MTA is most commonly used in these cases because of its sealing ability, biocompatibility and potential induction of osteogenesis and cementogenesis.

The major challenges associated with endodontic treatment of teeth with open apices due to resorption are achieving complete debridement, canal disinfection, and optimal sealing. One of the aims of endodontic treatment is to form an apical barrier or a stop against which one can place canal filling material avoiding over extrusion.

Recently mineral trioxide aggregate (MTA) has emerged as a reliable material due to its biocompatibility, good sealing property, and it encourages regeneration of peri-radicular tissues such as periodontal ligament bone and cementum. MTA renders favorable properties for the management of tissues damage caused by ERR.

The present case report describes the advanced ERR in the permanent incisive central which is treated with MTA obturation.

### CASE

A 20 year-old male patient reported to departement of endodontic, with the chief complaint of pain in his upper right central incisor. Twelve years ago he got an accident and his upper right central incisor got broken. His gum was often swollen but he never took any medicine. On clinical examination of tooth 11, it was found that his tooth was perforated, tender to vertical percussion and no tooth mobility was seen. The Intraoral periapical radiographic examination of tooth 11 revealed root resorption on the root, associated with periapical radiolucency and some bone loss



**Figure 1:** initial x-ray showing ball shaped external root resorption with periapical radiolucent lesion.

## CASE MANAGEMENT

Under rubber dam isolation access opening in tooth #11 was done and single root canal was found. Working length was measured with apex locator (Morita, Kyoto, Japan) and confirmed with periapical x-ray (Figure 2). Canal was cleaned and shaped with reciproc 40 (VDW, Germany) with brushing movement technique, irrigation with sodium hypochlorite 2,5%, and followed by normal saline solution and EDTA 17% as final irrigation. Using EndoActivator System (Dentstply Tulsa Dental Specialties, Tulsa, OK) to activate the irrigant. Canal was dried with absorbents points and calcium hydroxide as an intracanal medicament placed in canal and then followed by a temporary filling for 2 weeks.



**Figure 2:** x-ray shows obturation with calcium

After the 1 week temporary filling was removed, the root canal was cleaned and dried. MTA was manipulated according to the manufacture instructions. The canal was obturated with MTA on the apical third, the material was placed in the canal with microapplicator and vertically condensed with hand plugger. Finally it

was covered with moist cotton pellet and followed by temporary filling with cavite (3M ESPE, St. Paul, MN, USA). After 1 day, the temporary filling was removed, the canal was filled using injection termoplastis technique (Beefill, Dentsply, Germany) and resin sealer (AH plus, Dentsply, Germany) from orifice up to middle third of apical. The endodontic treatment was done and recalled after seven days for restoration procedure.



**Figure 3.** x-ray shows obturation with MTA and injection termoplastis.

After the 1 week temporary filling was removed, the canal was prepared for fiber post insertion. Porcelain fused to metal is used as the final restoration.



**Figure 5.** The canal was prepared for fiber post insertion



**Figure 6.** After preparation for crown



**Figure 7.** After insertion of crown porcelain fused to metal.

After 3 month later the patient was recalled for follow-up. At the clinical examination the tooth was asymptomatic and the radiographic examination showed periapical tissue healing.

## DISCUSSION

External root resorption is one of the most difficult dental treatment case. The Goal of apexification is to obtain an apical barrier to prevent the passage of toxins and bacteria into periapical tissues from root canal. Root canal treatment is required for external root resorption treatment. A pulpectomy will remove the granulation tissue and blood supply of these cells. For this reason, a pulpectomy alone is predictable treatment form in this type of resorption. For external resorption, it is critical to control the pulpal bacteria that act as a stimulation removed from the dentinal tubules can predictably arrest this

type of root resorption. In this case, canal was cleaned and shaped with reciproc 40 VDW with brushing movement technique because of the size of the canal which is bigger than the normal canal size.<sup>1,2</sup>

Calcium hydroxide is the intracanal medicament of choice for treatment of external pulpal infection. Its strong antibacterial effect and low solubility create a long term effect in the root canal and remove the stimulation factor from the main canal. CH also increases the pH of dentin (8,0-10,0) and therefore inhibits the activity of osteoclastic acid hydrolases in periodontal tissues and activates alkaline phosphatases.<sup>2,6</sup>

MTA is a bioactive material that mainly composed are tricalcium and silicate. Investigation has shown that MTA can conduct and induct hard tissue formation. MTA surfaces supports osteoblast cell attachment that is essential for osteogenesis, and MTA does not has a negative effect on the viability and morphology of cementoblasts and induced biomineralization of cementoblasts.<sup>2</sup> Antibacterial / antimicrobial activity of MTA seems to be associated with elevated pH. It was observed that an initial pH of 10.2 for MTA rising to 12.5 in 3 hours, it is known that pH level in order of 12.0 can inhibit most microorganisms including resistant bacteria such as *Enterococcus faecalis*. MTA was successfully used as a barrier between the root canal space and the periodontal tissue in cases of root perforation.<sup>4,5</sup>

After the canal is filled with MTA in the apical third, the injection thermoplastis technique is used to fill the canal using (Beefill, dentsply) from orifice up to middle third of apical. The use of System B HeatSource® offers a modification of the warm gutta-percha with the continuous wave condensation technique. The main advantage of this technique is that the gutta-percha canal filling can be performed through a continuous movement, with a plugger, electrically heated at the temperature recommended by the manufacturer (200 °C) therefore, allowing accessory canal filling<sup>7,8</sup>

## CONCLUSION

The use of biomaterials, such as MTA in teeth with perforating external root resorption gave optimal results

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