Treatment of teeth with perforation using reparative cement and sealer based on MTA

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Introduction

Root perforation is a technical accident in which an artificial opening is made, communicating the pulp chamber, root canals and periapical tissues. A good prognosis depends on the perforation to be sealed with a biocompatible material which in addition to its physical properties, allows the repair of nearby tissues (JuarézBroon et al., 2006).

Historically, several materials were used for retrograde filling and repair of perforations, such as amalgam, zinc oxide base cements and eugenol, composite resin and glass ionomer cements. Unfortunately, none of these materials was able to satisfy the total needs of an ideal material (Johnson, 1999).

Mineral Trioxide Aggregate (MTA) was first described in dental science literature in 1993 and was approved for Endodontic use in 1998 (Lee, 1993; Schmitt, Bogen, 2001). And since then, it has been used in several situations, such as sealing perforations, mainly for its ability to form mineral tissue, ability to seal and biocompatibility (Torabinejad, Chivian, 1999; Torabinejad, Parirokh, 2010; Guerreiro-Tanomaru et al., 2016).

MTA is the material that provides high potential for induction of dentinogenesis, cementogenesis, is antimicrobial as well as promotes proper marginal sealing, preventing infiltrations, in addition to being biocompatible and having a matrix more similar to the color of teeth, avoiding darkening (Mota et al., 2010; Guerreiro-Tanomaru et al., 2016). This article reports two clinical cases of perforated teeth which were filled with reparative cement and sealer based on MTA during endodontic treatment.

Clinical Case Report

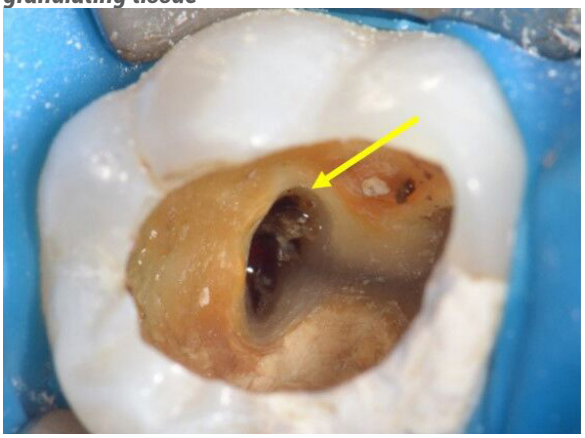
Female patient, 12 years old, came to the Extension Project– Clinical Care for patients in need of endodontic and restorative treatment in molar teeth, in the School of Dentistry at Federal University ofUberlândia (FOUFU), with a prior story (25 days before) of localized, pulsatile, long-lasting pain on tooth 46, which had received care on an emergency appointment at a private clinic.

In her first appointment at the project, the patient presented clinical status of a coronary opening on tooth 46, an exacerbated response to the cold thermal test (Endo-Ice, Maquira, Paraná, Brazil) and absence of pain in the vertical and horizontal percussion tests. Radiographically, the tooth showed a large pulp chamber, normal root canals and thickening of the periapical ligament, mainly in the furcation region (Figure 1A and 1B). After anesthesia and absolute isolation, the crown opening was improved using a multiblade bur with inactive tip (Endo Z, Angelus Indústria de Produtos Odontológicos S/A, Londrina,

Brazil) and removal of carious tissue with dentin spoon due to presence of a perforation at the level of the cervical third in the vestibular system of the distal canal (Figure 2). The preparation of the cervical and middle thirds was performed using Hedströen #15, #20 and #25 manual files (Dentsply-Maillefer, Ballaigues, Switzerland) and abundant irrigation activated manually with sodium hypochlorite 1%. Intracanal medication based on calcium hydroxide PA (Biodynamic, Ibiraporã, Brazil) associated with a saline solution was placed in the perforation and root canals and then sealed with a temporary cement.

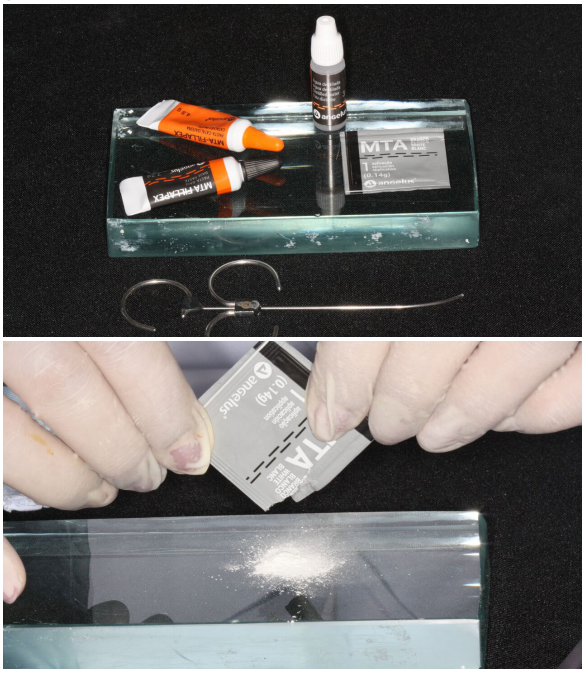
Figure 1. (A) and Initial Radiographic (B) Aspect

Figure 2.Perforation on the distal canal, note granulating tissue



After 15 days, the three canals were instrumented with Protaper Universal rotating system (Dentsply) to the F3 file, irrigated with sodium hypochlorite 1% and again medicated with calcium hydroxide. A week later, the perforation was filled with repairing cement based on MTA (Angelus) using an MTA applicator of diameter 1.2 mm (Angelus Indústria de Produtos Odontológicos S/A) (Figures 3A, 3B, 3C, 3D, 3E e 4A, 4B). The canals were filled using the lateral and vertical condensation technique with endodontic cement based on MTA (MTA Fillapex, Angelus Indústria de Produtos Odontológicos S/A) and guttapercha cones (Dentsply) (Figure 5A, 5B).

Figura 3A, 3B, 3C, 3D, 3E. Material used for fillingthe canals and manipulation of reparative cement based on MTA



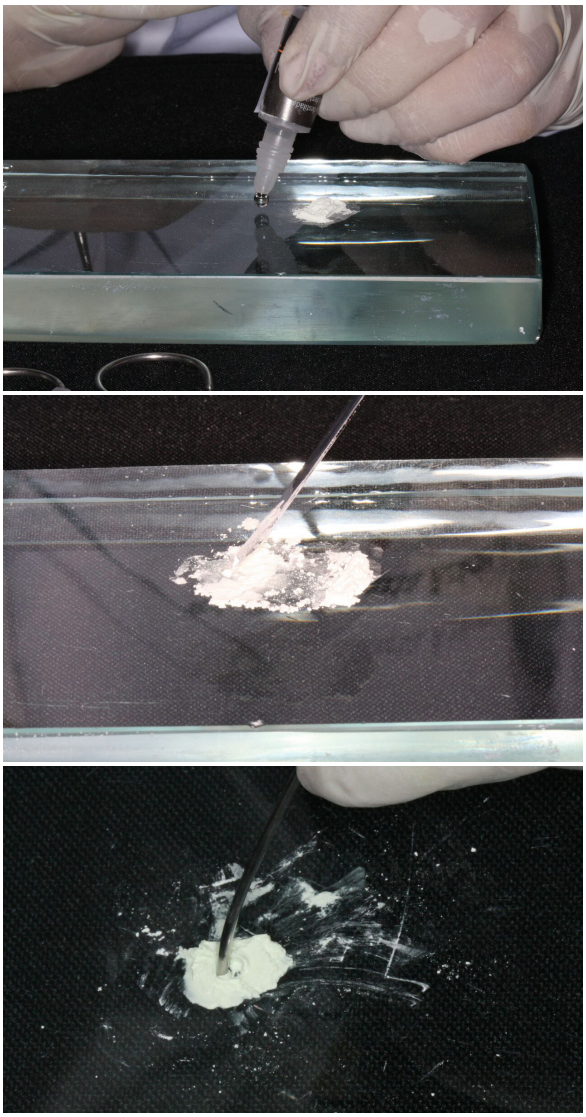
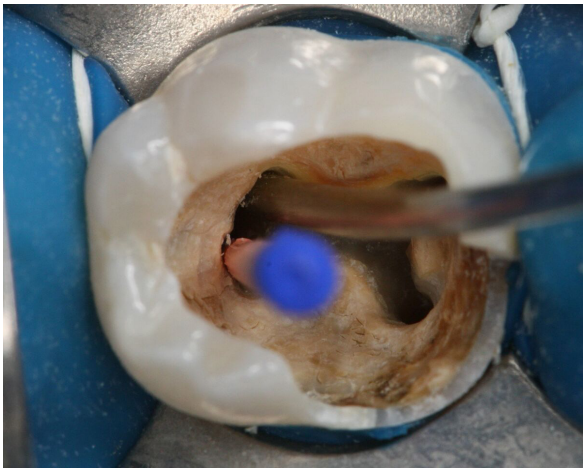


Figura 4A, 4B. Applying the restorative sealer based on MTA



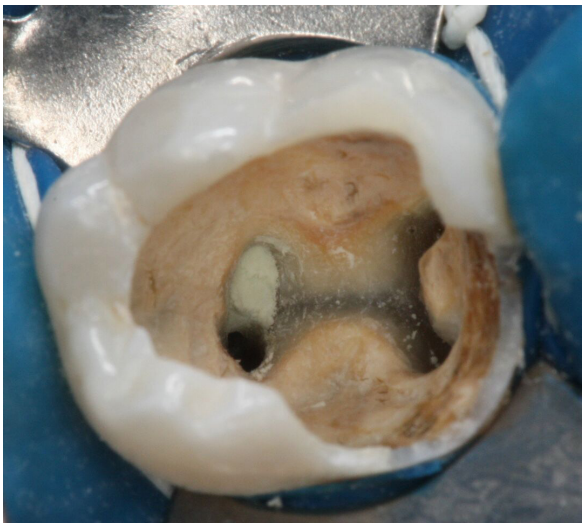
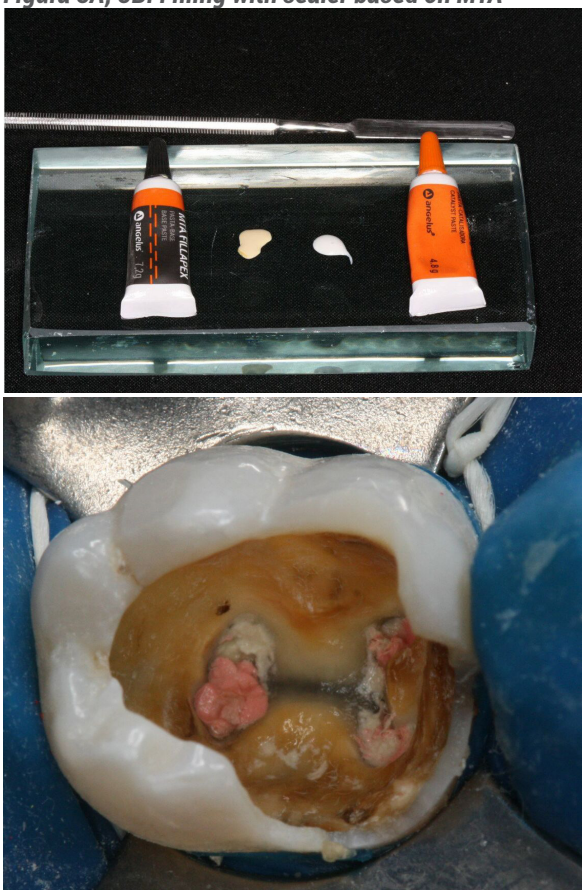


Figura 5A, 5B. Filling with sealer based on MTA



In the last session, relief of the distal canal was performed with largo burs #2 and #3 (Dentsply) and sealing with fiberglass posts #1 (Reforpost, Angelus Indústria de Produtos Odontológicos S/A) with cement based on dual resin (Allcem, FGM

Produtos Odontológicos, Santa Catarina, Brazil) and reconstruction of the crown with composite resin (Filtek Z250 XT, 3M ESPE, São Paulo, Brasil) (Figure 6).

Follow-up was performed after 6 months, showing absence of clinical and radiographic pathological signs (Figure 7A, 7B).

Figure 6. Sealing with fiberglass post

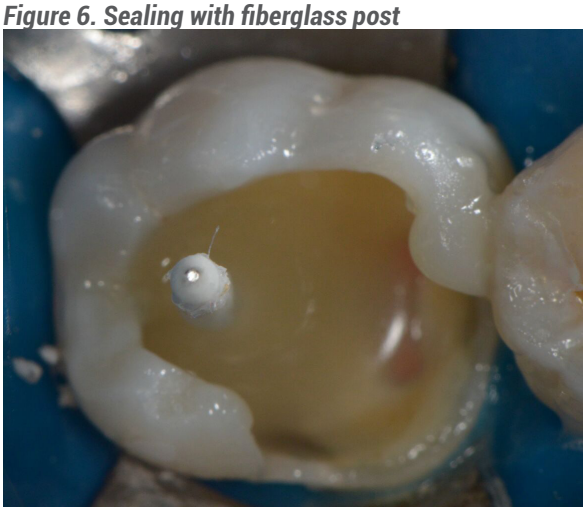


Figura 7A, 7B. Clinical (A) and Radiographic (B) aspect after 6 months

Conclusion

After the clinical and radiographic follow-up of the cases 6 months after completing the treatment, it was observed that MTA was effective, successful in sealing the perforation. Thus, allowing the maintenance of the dental element, returning function and periodontal health to the patient.

References

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