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Management of obliterated canal, periapical injury and cervical perforation

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Abstract
Introduction: Root canal obliteration is the result of accelerated dentin deposition within the root canal space. The American Association of Endodontics (AAE) classifies it as a high level of difficulty, since procedural errors may occur, such as perforation, which is the creation of a communication between the duct system and the periradicular tissues.
Clinical case: Female patient referred to the Endodontics graduate program with a "previously initiated" diagnosis. Clinical and radiographic examination revealed tooth # 12 with cervical perforation, obliterated canal, and periapical lesion. The perforation was sealed with Biodentine, the canal was located using a microscope, conductometry was taken with a #08K file and instrumented with ProTaper Next; it was irrigated with 5.25% sodium hypochlorite (NaOCl). Calcium hydroxide (CaOH2) with propylene glycol was placed as intracanal medication between each appointment before finishing. It was obturated with gutta-percha from the system and AH Plus sealer.
Discussion: McCabe and Dummer (2012) [1] determined that procedures on teeth with root canal obliteration should be limited to cases with symptomatic and/or radiographic signs of periapical pathology. Ingle *et al.* [2] (1985) found that the second most common reason for endodontic failure is root perforation. Although, depending on the size, location, type, time and sealing material, its prognosis can be modified.
Conclusion: Tooth perforation is the most common result of iatrogenic damage during endodontic access when attempting to locate an obliterated canal. The size, location, and time that elapses from the moment of the perforation and a good sealing with biomaterials help the success of the treatment.

Keywords: Obliterated canal, periapical injury, cervical perforation

Introduction
Root canal obliteration is the result of accelerated deposition of dentin within the same space. The AAE classifies it as having a high level of difficulty, since procedural errors may occur, such as perforation, which is the creation of a communication between the duct system and the periradicular tissues; it usually occurs in curved roots or roots with superficial invaginations [3]. Bioceramic materials that are biocompatible by nature with good physical and chemical properties are used in endodontics as pulp capping materials, pulpotomy, repair of perforations, filling of root treatments, filling of immature teeth with open apices [4]. They are inorganic, non-metallic materials, they induce tissue regeneration, cell differentiation. They are chemically stable, non-corrosive, and interact well with organic tissue. They have good sealing ability, antibacterial, antifungal activity [5]. Bio dentine is one of the silicate-based bioceramics, in which certain elements of Mineral Trioxide Aggregate (MTA) have been eliminated and bismuth oxide has been replaced by zirconium oxide [6].

Clinical case
A 36-year-old female patient presented to the endodontic clinic at the Torreón School of Dentistry for evaluation and with a request to save her upper right lateral incisor rather than

extract it. Clinical and radiographic examinations revealed a cervical perforation, obliterated canal, and periapical lesion (fig.1, 2). A cone beam computed tomography (CBCT) scan was ordered to determine the size of the lesion (Fig 3). And she is given an appointment to start her treatment.

At the first appointment, the area to be treated was anaesthetized with 2% lidocaine, and absolute isolation was performed. The perforation was located with magnification, disinfected with 17% chlorhexidine, and sealed with Bio dentine, which is a bioactive material that stimulates cell proliferation and biomineralization. (Fig 4, 5) Teflon and Cavit were used to further seal the perforation.

Conductometry was taken with a #08K file and instrumented with the ProTaper Next system (Dentsply) while being irrigated with 5.25% sodium hypochlorite (NaOCl). Calcium hydroxide (CaOH2) with propylene glycol was placed as intracanal medication between each appointment before finishing.

In the second appointment, the canal was located with a #6 manual file, conductometry was taken, and the canal was instrumented up to #10 type K (fig 6). Conductometry was verified with an apical locator (Pixie), and rotary instrumentation was performed up to the X2 25.06 file (Pro Taper Netx). Between the uses of each file, the canal was irrigated with 5.25% sodium hypochlorite. A type K #10 file was used to create passage, and the canal was dried with paper points before placing calcium hydroxide with propylene glycol.

In the third appointment, the irrigation protocol was carried out, and the canal was obturated with gutta-percha from the system and AH-Plus sealing cement (fig 7, 8). In the final appointment, a fibre post (Para Post Coltene) was used for rehabilitation and cemented with LuxacoreZ. The tooth was reconstructed with the fibre post (fig 9). Control at three months, bone healing is observed (fig 10).

Discussion

The perforation acts as a conduit for the entry of microorganisms from the oral cavity to the tooth or from the tooth to the periodontium, eventually leading to tooth loss. Not all perforations cause irreversible inflammation and failure. However, when a bacterial infection and/or an irritating (non-biocompatible) restorative material is placed over the perforation, healing will not take place properly due to continued irritation [7].

Farzaneh *et al*., [8] there was a significantly increased risk of disease in patients who required retreatment, and who also had preoperative perforation.

Ingle *et al*. (1985) [2] found that the second most common reason for endodontic failure is root perforation. Although, depending on the size, location, type, time and sealing material, its prognosis can be modified.

McCabe and Dummer (2012) [1] determined that procedures on teeth with root canal obliteration should be limited to cases with symptomatic and/or radiographic signs of periapical pathology. Apical surgery and intentional preimplantation have been suggested as treatment options when root canals are not accessible since both treatments ensure a direct approach to the apical third of the root.

Fig 1: Initial Photography upper right central incisor. We observed fisures in the vestibular part of tooth

Fig 2: Initial radiograph showing a radiolucent area in the cervical area of the tooth and a periapical lesion in upper right central and lateral incisor

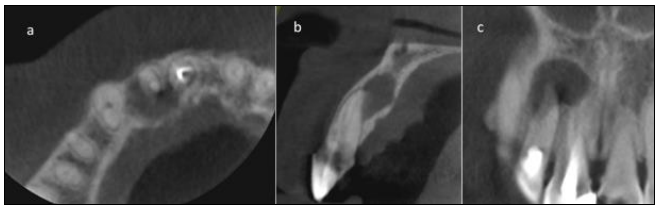

Fig 3: CBCT images of maxillary right lateral used to diagnose the presence of root canal, the size and location of the periapical lesion. A. Coronal reconstruction. B. Axial reconstruction. C. Sagittal reconstruction

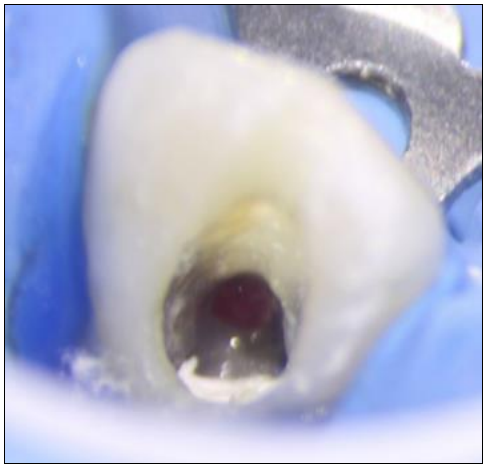

Fig 4: Perforation is observed in the cervical area

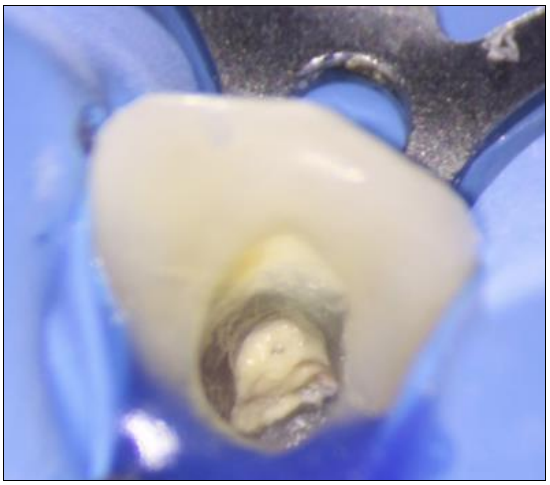

Fig 5: Perforation was sealed with Bio dentine

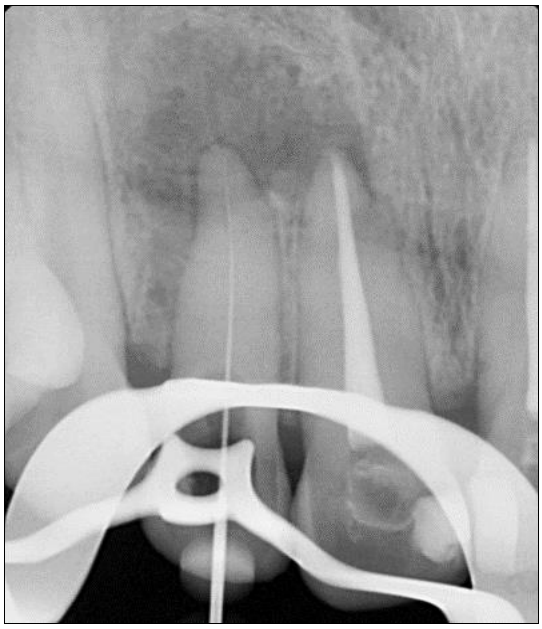

Fig 6: Conductometry with manual K file #10 using apex locator and radiography for confirmation

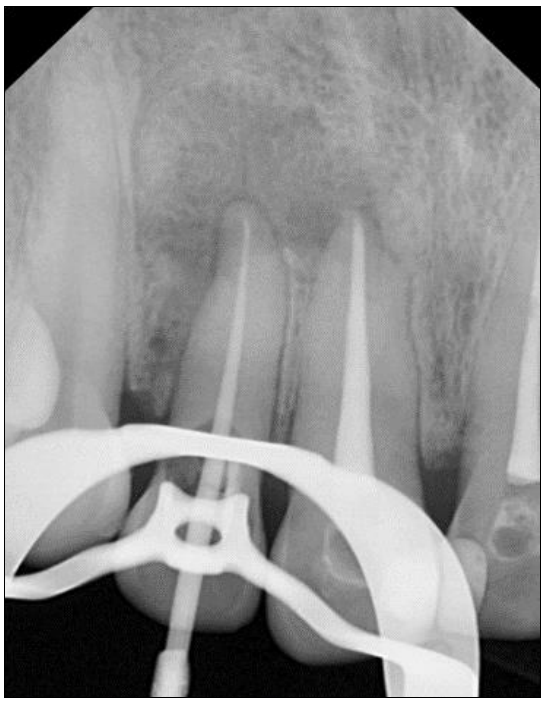

Fig 7: Master cone test with system gutta-percha

Fig 8: Final x-ray showing bone repair

Fig 9: Control at one month, bone healing is observed

Fig 10: Control at three months, bone healing is observed

Conclusion

The perforation of a tooth is the most common result of iatrogenic damage during endodontic access when trying to locate an obliterated canal and with a lack of anatomical knowledge of the canals it could be a greater risk. The size, location, and time that elapses from the moment of the perforation and the adequate sealing with biomaterials help the success of the treatment, in addition to the use of technology such as magnification and CBCT.

Conflict of Interest

Not available

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