



## ENDODONTIC TREATMENT OF DENS INVAGINATUS WITH TRAUMA HISTORY

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### INTRODUCTION

Dens invaginatus is a development anomaly (malformation) of teeth resulting in an invagination of the dental papilla during the development of the teeth<sup>1</sup> and radiographically it resembles to a tooth inside the other, that's why the expression dens in dente<sup>2</sup>. In literature, there are other denominations of dens in dente, dens invaginatus and dilated odontoma among others, due to different opinions regarding its etiology<sup>3</sup>.

The treatment of dens invaginatus covers different clinical procedures. In healthy teeth it is advisable to apply sealant of cavities and fissures for physical protection of the invagination of dental tissue. In the presence of caries, without pulp exposure, the tooth should be restored. When pulp exposure occurs, the approach can vary from a more conservative treatment (pulpotomy or direct pulp capping) for tooth endodontics, depending on how the tissue is compromised. The endodontic treatment can be with or without apicectomy adjacent to the retrograde filling<sup>4</sup>.

Several factors can affect the prognosis in non-surgical treatment of dental invagination. Mineral Trioxide Aggregate (MTA) has been used for the filling in cases of abnormal apical anatomy. Its properties, such as the ability to curing in humidity, biocompatibility and superior sealing, make it a potential option to seal

invasive invaginations<sup>5</sup>.

Therefore, it is of great importance that the dentists have clinical and radiographic knowledge over this anomaly to obtain the diagnosis, thereby establishing a treatment plan, selecting appropriate materials and performing the proper follow-up of the patient.

### CLINICAL CASE REPORT

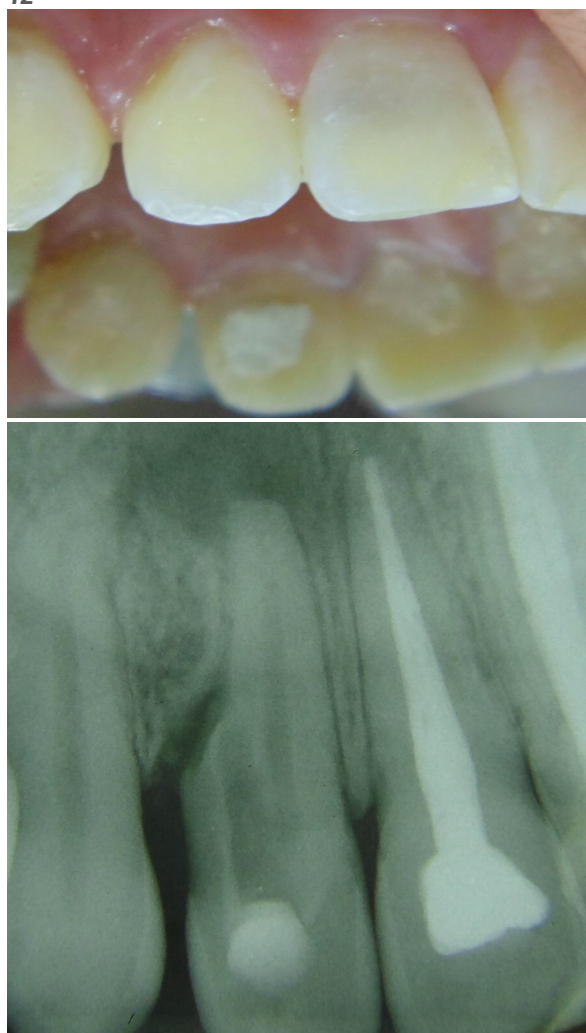
Female patient, 24 years old, came to the Faculty of Dentistry at the Federal University of Uberlândia (FOUFU) for evaluation of tooth 12, with historic record of intense spontaneous pain, and had undergone an emergency appointment before. The patient presented external reabsorption of tooth 12, history of trauma in the anterior teeth and had already performed orthodontic treatment.

Clinically, the tooth presented provisional restoration (Figure 1), slight mobility from canine to canine, without fistula and asymptomatic. A cold thermal pulpal sensitivity test was conducted with negative result (Endo-Ice, Maquira, Paraná, Brazil). In the radiographic examination (Figure 1), an extensive apical radiolucent area was observed, periapical and lateral bone reabsorption and the presence of two root canals. According to the clinical and radiographic findings related to the first appointment at FOUFU, the potential clinical diagnosis was dens in dente with Chronic Apical Periodontitis, and the endodontic radical treatment was indicated.

In the same session, the endodontic treatment was initiated in tooth 12, and the modified absolute isolation was performed. The coronary opening was performed with spherical diamond bur #1014 (FAVA, Pirituba,

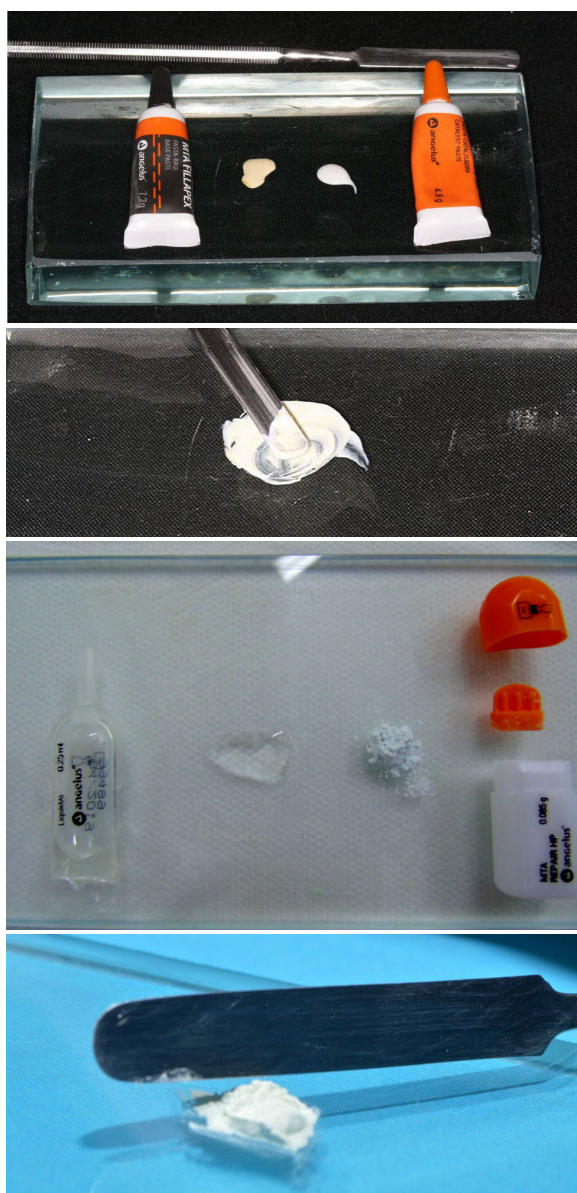
SP, Brazil) and Multiblade Bur with Inactive Tip (Endo Z, Angelus Indústria de Produtos Odontológicos S/A). The two canals (one mesial and another distal) were accessed and explored initially with manual file, type K-file #15 (Maillefer, Dentsply, Tulsa, Oklahoma, USA). The odontometrics showed that the mesial canal was 22 mm long and the distal was 15 mm long. After the odontometrics, the instrumentation of root canals for the staggered technique using K-File type files was performed (Dentsply, Maillefer) using file #15 to memory #40 in mesial and #45 in distal, retreating until the file #70. All instrumentation was followed by irrigation with sodium hypochlorite to 2.5%. The canals were filled after instrumentation with intracanal medication of calcium hydroxide paste associated with PMCC (Callen, SSWHITE, São Cristóvão, RJ, Brazil) and sealed with provisional sealant based on zinc oxide and eugenol.

**Figure 01. Clinical and radiographic aspects of tooth 12**



After a month with medication, filling of root canals and definitive restoration were performed. Before filling, irrigation with EDTA was performed for 3 minutes, followed by irrigation with sodium hypochlorite to 2.5%, the canals were dried with absorbent paper cones (Maillefer, Dentsply). The filling of the mesial canal was performed using the lateral and vertical condensation technique with endodontic sealant MTA-based (MTA Fillapex, Angelus Indústria de Produtos Odontológicos S/A) and gutta-percha cones (Odous de deus). Then, the distal canal was completely filled with repairing sealant MTA-based (MTA Repair HP, Angelus Indústria de Produtos Odontológicos S/A) (Figures 2 and 3).

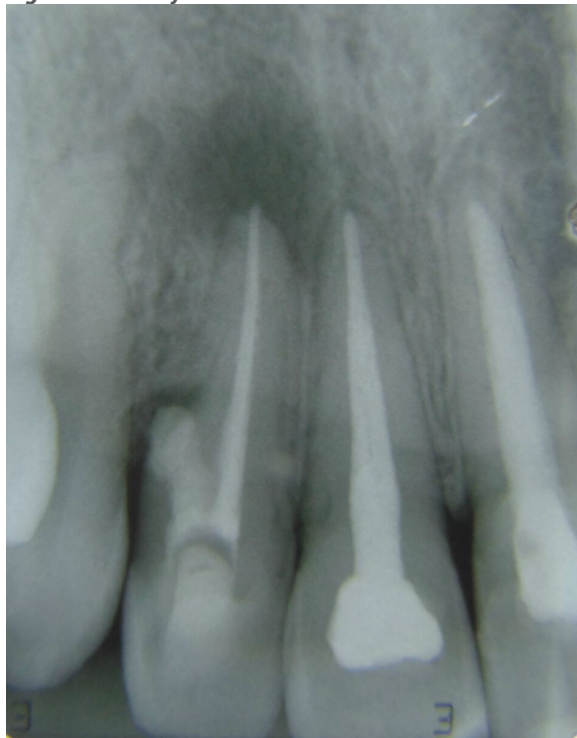
**Figure 02. Materials used for the filling of root canals**



**Figure 03. X-ray and clinical aspect after filling**



**Figure 04. X-Ray after 6 months**



After six months, a Cone Beam computed tomography for monitoring and verifying prognosis was also performed (Figures 5 and 6). In the coronal cuts, the presence of hypodense area (radiolucent) area was observed in the middle third of the distal side (distal canal, invagination) and in the mesial canal (Figure 5). In sagittal cuts, an overflow of filling material in the vestibular of the middle third of the distal canal, and of the hypodense area (radiolucent) in the periapical region of the mesial canal (Figure 6) was observed. Apparently, the size of the periapical lesion of the mesial canal was reduced.

After six months of follow-up, it was possible to observe the start of the periapical lesion repair process, the tooth is in function, asymptomatic and with absence of periodontal pocket and mobility (Figure 4).

Figure 05. Coronal cuts of tooth 12

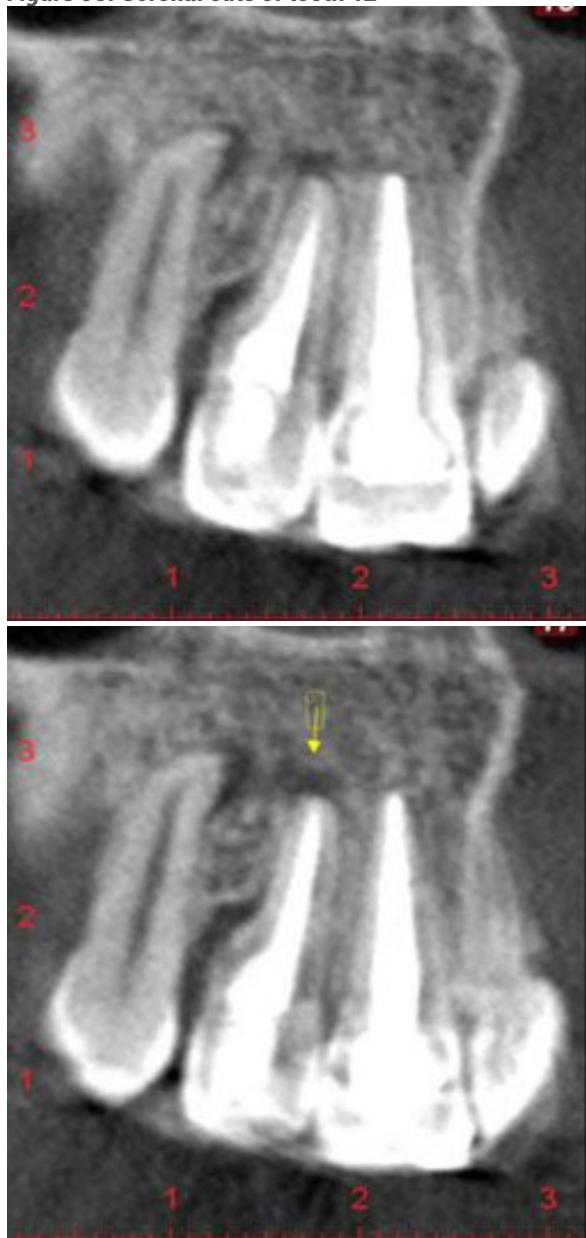
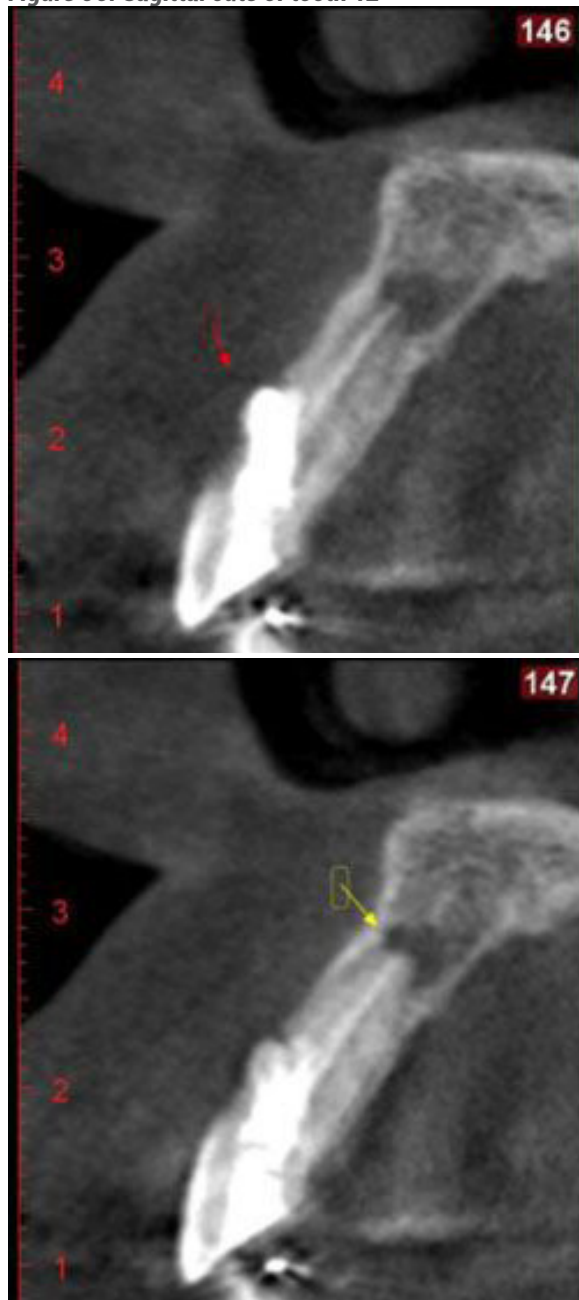


Figure 06. Sagittal cuts of tooth 12



## CONCLUSION

After the end of the clinical case and based on the researched literature, we conclude that dens invaginatus usually occur in the upper lateral incisors and need endodontic treatment, as the invagination predisposes to the development of caries and consequent pulpal inflammation. The complexity of the anatomy of dens invaginatus generates difficulties in endodontic treatment, from the view of the actual format of its internal anatomy, the complete cleaning of canals to the filling material choice for an effective sealing, as is the case of MTA Fillapex and MTA Repair.

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