ABSTRACT
Dens invaginatus is a dental anomaly that may show many different complex anatomical forms. The complexity of the internal anatomy of the root canal may create difficulties and challenges for treatment completion of the root canal. A 10-year-old girl was referred by her dentist suffering from pain and a persistent infection arising from the maxillary left lateral incisor. After clinical examination, the case was classified as Oehler’s type II due to invagination extending through the root canal with no communication with the periodontal tissue. The main canal contained a central cylindrical mass of hard tissue. Owing to a limitation in access to the canal system and the cleaning and sealing of canal spaces, a modification of the internal anatomy of the canal system was achieved under the operating microscope. The conventional chemical and mechanical preparation with sodium hypochlorite combined with intracanal calcium hydroxide was done. The root canal was obturated with MTA. In this case, the conventional root canal treatment and the modification of the internal anatomy promoted the regression of the lesion noted at 2-year follow up.

KEYWORDS
Dens invaginatus, Dental anomalies, Root canal treatment, MTA, Anatomical modification.

INTRODUCTION
Dens invaginatus is a dental anomaly that may show many different complex anatomical forms. The etiology is controversial and remains unclear resulting in an invagination of the enamel organ into the dental papilla during tooth development. The invagination allows entry of irritants into an area which is separated from pulpal tissues by only a thin layer of enamel and dentin and presents a predisposition for the development of infection. Thus without any history of caries, or trauma, irritants and microorganisms from the oral cavity cause inflammation. Treatment options were limited to extraction. The dramatic improvement in endodontic armamentarium has made possible the conservative treatment of such anomalies. The most affected teeth are the maxillary lateral incisors, followed by central incisors, canines, premolar and molars. Three classifications were proposed by Oehlers:

Type I: the enamel invagination within the crown and not extending beyond the cement-enamel junction (CEJ).
Type II: the enamel invagination into the root without communication with the periodontal ligament (PDL).
Type III: the invagination into the root and extending beyond the CEJ to communicate with PDL space through an additional apical or lateral foramen. The complexity of the internal anatomy of the root canal may create difficulties and challenges for treatment completion of the root canal. The complex anatomy of these anomalies makes treatment procedures harder. Further follow-up of these cases should not be neglected to evaluate the treatment success.

CASE REPORT
A 10-year-old girl was referred by her dentist suffering from pain and a persistent infection arising from the maxillary left lateral incisor. On clinical examination, an intraoral sinus tract buccal to the maxillary left lateral incisor was present (Fig. 1). The tooth was tender to percussion and non-mobile. Radiographic examination revealed a large radiolucency apical to maxillary left lateral incisor and confirmed the diagnosis of dens invaginatus (Fig. 2). After clinical examination, the case was classified as Oehler’s type II due to invagination extending through the root canal with no communication with the periodontal tissue. The main canal contained a central cylindrical mass of hard tissue. Owing to a
Working length was determined (Fig 5); conventional chemical and mechanical preparation with sodium hypochlorite combined with intra-canal calcium hydroxide was done. The root canal was obturated with MTA. The coronal third was sealed with composite restoration (Fig 6). After one year of the treatment, the tooth was re-examined (Fig 7). The patient remained asymptomatic. The radiograph revealed evidence of apical bone healing (Fig 8).

limitation in access to the canal system and the cleaning and sealing of canal spaces, a modification of the internal anatomy of the canal system was achieved under the operating microscope (Fig 3). The hard tissue core was removed using ultrasonic instrumentation and pulled out with a hand endodontic instrument (Fig 4).
DISCUSSION
The successful treatment of dens invaginatus based on mainly accessibility to and disinfection of the root canal system. In the present case, the removal of the dens or hard tissue core from the canal system provided the ability to disinfect and seal the root canal. The conventional root canal treatment combined with MTA application resulted in a regression of the periapical lesion noted at the recall visit.

CONCLUSION
For a dens invagination treatment, a clinician may consider a modification of the internal anatomy of the canal system to gain better access for instrumentation, disinfection and sealing of the root canal. More research has to be performed to establish technical standards for treatment of complex anatomical cases.

REFERENCES