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Clinical case

Endodontic treatment of the maxillary first molar with five root canals – Three case reports

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ABSTRACT

Although the presence of three and four root canals are the most common anatomic configuration of the maxillary molar, other morphologies have also been reported. The purpose of this report is to show a series of clinical cases of maxillary first molars with five root canals. Improved understanding of these uncommon anatomic configurations should lead to better clinical outcomes. The use of the dental operating microscope and cone beam computer tomography was an important auxiliary when approaching the reported cases.

Tratamento endodôntico do primeiro molar superior com cinco canais radiculares – três casos clínicos

Palavras-chave:
Tratamento endodôntico
Molar
Anatomia

RESUMO

Apesar da presença de três e quatro canais radiculares ser a configuração anatómica mais comum no primeiro molar superior, é possível identificar outras morfologias. O objectivo deste trabalho é apresentar uma série de casos clínicos de primeiros molares superiores com cinco canais radiculares. O conhecimento de anatomias menos comuns pode levar a melhores resultados clínicos. A utilização do microscópio operatório e o recurso a imagens de cone beam podem ser meios auxiliares importantes na abordagem destes casos.

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Introduction

Most studies on maxillary first molar anatomy report it to be a three rooted tooth with three or four root canals.[1–4] However, not only the number of the roots and root canals are variable,[5–10] but also the shape of the pulp cavity.[11] The failure of identifying the presence of an anatomic variation may compromise the success of the treatment.[12] A review study on the anatomy of the maxillary first molar from Cleghorn et al.[1] reported an incidence of the mesiopalatal canal (MP) of 56.8% and a prevalence of the distopalatal canal (DP) of 1.7%.

The aim of this paper is to show unusual maxillary first molar anatomic configurations with a presence of both mesiopalatal and distopalatal root canals.

Case reports

The presented cases had endodontic treatment performed in private clinics in the area of Lisbon. After diagnosis formulation and the treatment proposed and accepted, all the teeth were anaesthetized with a buccal infiltration using 1.8 ml of 4% articaine with 1:200,000 epinephrine (Artinibsa, Inibsa, Spain), proper rubber dam isolation was obtained, the decay was excavated and the proper access cavity was achieved. The root canals were identified and then negotiated with a stainless steel ISO size .08 hand files to the working length as determined by radiograph and electronic apex locator (Root Zx II, Morita, USA). Apical enlargement with hand files was performed until a manual glide path was achieved with stainless steel ISO size .15 hand files. The mechanical instrumentation was performed with the Protaper NiTi rotary files (ProTaper Universal, Dentsply Maillefer, Switzerland) as instructed by the manufacturer. All the instrumentations were performed with a continuous irrigation with 5.25% sodium hypochlorite. Because of the time required to accomplish the therapy none of the teeth were finished in one appointment. After the bio-mechanical preparation the root canals were dried with paper points and a paste of calcium hydroxide (Ultracal, Ultradent, USA) was used as intracanal medication. Cavit (Cavit W, 3M ESPE, Germany) was used as a provisional restorative filling between visits. At the second appointment one last rinse with 5.25% sodium hypochlorite was performed and the canals dried. Gutta-percha master points were fit. AH plus (AH Plus, Dentsply, Germany) was used as sealer. The obturation technique chosen was the continuous wave of condensation technique, the downpack was accomplished with a System B unit (System B, Sybron Endo, USA) and the backfill with an Obtura II unit (Obtura II, Obtura Spartan, USA). The pulp chambers were cleaned with a cotton pellet of alcohol and restored provisionally with Cavit temporary filling. All the teeth were scheduled for a permanent restoration as soon as possible.

Case report 1

A 16-year-old female presented to an emergency endodontic appointment with a chief complaint of spontaneous pain, and increasing pain to temperature variations in the maxillary right side. The medical history was non-contributory.

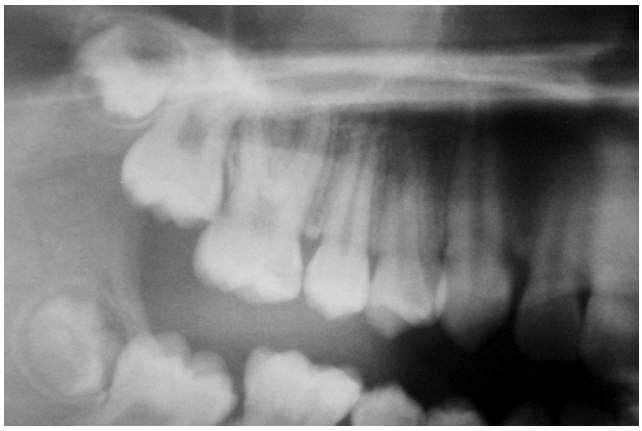

Fig. 1 – Initial radiograph of tooth 16.

A clinical and radiographic examination revealed a carious lesion on the mesial buccal side of the maxillary right first molar (tooth 16) (Figs. 1 and 2). The reaction to the ice sensibility test was an intense pain that remained present for more than one minute. The adjacent teeth had a normal response to this test. The diagnosis was an irreversible pulpitis on tooth 16. The endodontic therapy was proposed and accepted.

After proper anaesthesia and rubber dam isolation, the access cavity was prepared. During the exploration of the pulp chamber floor with a dental operating microscope (Opmi Pico, Carl Zeiss Surgical, Germany) it was possible to identify five canal orifices: two in the mesiobuccal root (MB and MP canals), two in the distobuccal root (DB and DP canals) and one in the palatal root (Fig. 3). During the root canal negotiation it became apparent that both canals in the mesiobuccal root were joining together in the apical third of the root. The same was happening in the distobuccal root. After measuring the working length, the rotary instrumentation was finished to an F2 Protaper in the buccal canals and with an F3 file in the palatal. After bio-mechanical preparation, the canals were dried and filled with a calcium hydroxide paste. The access cavity was provisionally restored. At the second visit, two weeks later, the root canal obturation was performed (Figs. 4 and 5).

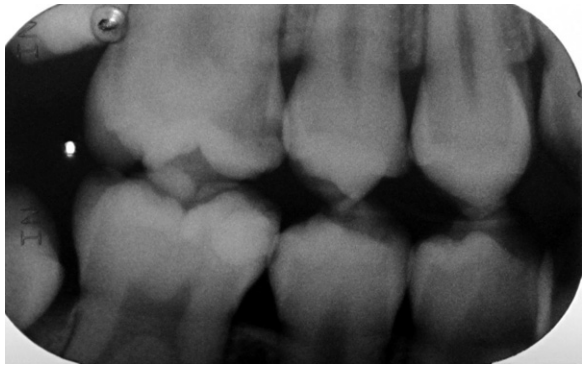

Fig. 2 – Initial bitewing radiograph of tooth 16. A large mesial decay can be seen.