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ABSTRACT

The major objectives of endodontic therapy are to clean and shape the root canal in order to create three-dimensional obturation of the root canal system and to encourage periapical healing, however this is not always possible due to the intricate architecture of the root canal system. The treatment of a maxillary first molar with two palatal canals is described in this case report.

Key words: Maxillary first molar, Palatal Root; Root Canal Anatomy

Introduction

Preventing apical periodontitis is the main goal of endodontic therapy^{1,2}. The inability to shape, clean, or obturate every existing root canal is one of the main causes of endodontic therapy failure³. The ability of the clinician to distinguish the anatomical variations of the root canal system is crucial to the success of endodontic therapy. The permanent maxillary molars typically consist of two buccal roots and one palatal root, for a total of three roots. Mesiobuccal II is occasionally present^{4,6}.

Shahi et al.⁶ observed that 0.73% of the first molars had two palatal canals, whereas Zheng et al.⁷ reported prevalence rates of 1.12 and 1.17% for the presence of an extra canal in the distobuccal and palatal roots, respectively. In the literature, there are numerous papers that discuss variances in the number of palatal roots in maxillary first molars. Either two distinct palatal roots, each with their own canal, or one palatal root with two canals are described as existent.⁵ Unusual roots and root canal morphologies in molars have been described in several investigations^{1,2,9,10}. It has been estimated that 2 to 5.1% of maxillary molars have extra canals in the palatal root. Stone and Stroner¹² discovered that the likelihood of extra channels in the palatal roots of maxillary molars was less than 2%.

Despite the low prevalence of an additional canal in the palatal root, it is crucial to account for this variance during root canal therapy to assure success.⁸ To avoid endodontic failure, these additional canals must be located and cleaned out.

Dentists must take into account radicular anatomical abnormalities even when their incidence is quite low. This clinical case shows maxillary first molar with three roots (mesiobuccal and distal canal and palatal canal with single orifice dividing in middle-third into two canals).

CASE REPORT

A 47-year-old patient reported to our dental clinic with chief complaint of continuous pain and impaction of food in right upper back tooth region. On clinical examination class II(DO) dental caries was detected in #16, on radiographic examination caries was approximating the pulp. Root canal treatment was advised in #16 on. Local infiltration(Lignox 2% A) was given in mucobuccalfold region of 16 and palatal anesthesia is given. Access opening was done under rubber dam retained around the tooth using dental floss. Three canal orifices (mesiobuccal, distal and palatal) were located.

Mesiobuccal and distobuccal canals were located and working length was determined. There was a hindrance in palatal canal in middle third, on taking radiograph in different angulation palatal canal was bifurcating into two in middle-third and then two canals were negotiated. Canals were instrumented using Protaper gold rotary files (densply). During instrumentation sodium hypochlorite, ethylenediaminetetraacetic acid 17% solution (Deo smearoff, Azure Lab.Pvt.Ltd) was used as irrigant.

Final irrigation was done using 2% chlorhexidine solution (Asep RC, Anabond Stedman, India). Canals were dried with paper points and obturated using lateral compaction technique. Patient was reviewed after six month tooth was asymptomatic and no periapical change seen radiographically.

Discussion

The thorough filling and cleaning of the root canal system are the objectives of root canal therapy^{2,6}. Sometimes, when the root canals are concealed, the dentist may forget to clean them. The evolution of the root canal's morphology is a key component of endodontic therapy.^{10,13}. Anatomical variations are often present in maxillary molars. Only 0.4–2% of second maxillary molars have two palatal roots or two palatal root canals, according to reports^{10, 11}. It's interesting to note that first maxillary molars are less likely than second maxillary molars to have two palatal roots or canals.

This condition's aetiology is unknown. The appearance of atavistic genes or external factors interfering with odontogenesis may be associated to the formation of extra root(s)¹⁴. According to Curzon¹⁵, the existence of extra roots in molars is likely connected to genetic penetrance. To identify the anatomical differences of the maxillary molars, radiological evaluation is required. It's important to carefully assess the exceptionally enormous coronal morphology when clinical assessment¹¹.

Conclusion

Every tooth has a different dental anatomy. Understanding these differences, especially with regard to where and how to treat all canals, is crucial for the success of endodontic therapy, as failures may result from an inability to locate and correctly treat root canals.¹⁶ Successful clinical outcomes require a thorough clinical and radiographic assessment, as well as a complete understanding of the morphology of these teeth.¹⁷

FIGURES

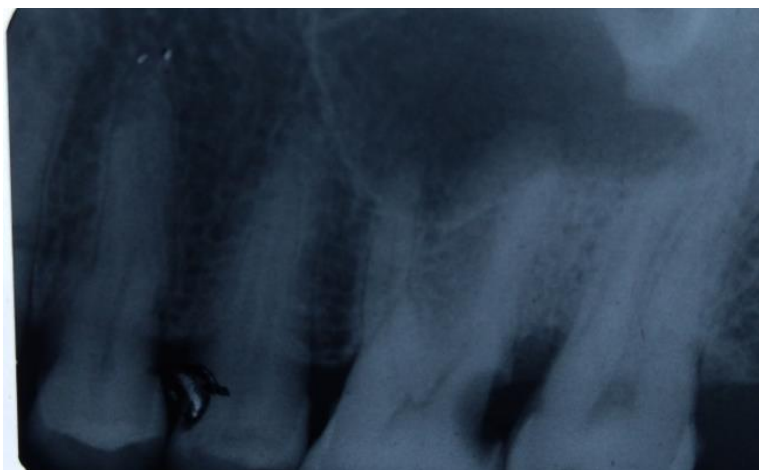


Fig 1 Preoperative radiograph



Fig 2 Master cone radiograph



Fig 3 Postoperative radiograph

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