

Maxillary First Premolar with Three Roots : A Case Report

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Abstract

Detection of normal and abnormal variation of anatomy of the teeth is essential for clinical success. The possibility of three roots in maxillary first premolars is quite low; however, it must be taken considered radiographically and clinically during endodontic treatment. In this case report has been described endodontic treatment of maxillary first premolar with three separate roots.

Keywords : Maxillary first premolar, Root canal morphology, Anatomical variations.

Introduction

To achieve a higher degree of clinical success in endodontic therapy, biomechanical instrumentation and obturation of the root canal system are required. These objectives can be achieved by detecting the potential anatomical variations of the teeth under treatment, because one of the main reasons for failure in root canal therapy is the lack of knowledge about the anatomy of root canals. Root canals are left untreated if the dentist fails to identify their presence, particularly in teeth that have anatomical variations or additional root canals^[1]. Even treatment of uncomplicated multirooted teeth requires knowledge of the most frequent anatomical formations and of possible variations. Extra roots are an additional challenge, which begins at case assessment and involves all operative stages, including cavity design, canal access, and localization, cleaning and shaping of the root canal system^[2]. The maxillary first premolar typically has two well-formed roots (56%) that divide in the middle third of the root and lie buccal and lingual to one another. About 40% have only one root containing two canals (type IV) that then unite in a common foramen^[3]. But, maxillary premolars have highly variable root canal morphology. Three-rooted maxillary first premolars are uncommon (0.5-6%)^[3-5] and frequently have one canal in each of three roots^[6]. The anatomy of maxillary premolars with three root canals, mesiobuccal, distobuccal and palatal, is similar to that of adjacent maxillary molars, and they are therefore sometimes called small molars or ridiculous^[10]. This article describes a clinical case of three rooted maxillary first premolar that is endodontically treated.

Case Report

A 51-yr-old male patient was referred to the private dental clinic for the treatment of painful left maxillary first premolar tooth. The medical examination revealed no general pathosis. Clinical evaluation revealed extensive caries associated with the maxillary first premolar that did not respond to electric pulp testing (Pulp vitality tester, Parkell, USA). The tooth was tender on percussion. Palpation was unremarkable. The diagnosis was made as acute apical periodontitis with necrotic pulp for the tooth. The radiographic examination of the tooth revealed two buccal roots (mesiobuccal and distobuccal) and one palatal root (Fig. 1).

The patient was given a local anaesthetic by periapical infiltration (2% lignocaine with adrenaline 1:200000). The tooth was isolated with a rubber dam. All the caries was removed and access to the pulp chamber was completed. Two buccal canals and one palatal canal were found as suggested by the initial radiograph. A working length radiograph was taken with 15# K-files (Dentsply, USA) (Fig. 2). The three canals were prepared using continuously rotating nickel - titanium files (Protaper sx, s1, s2, s3, f1, f2, f3, Dentsply, USA). A syringe was used to irrigate the canals with 2 mL of a 5.25% sodium hypochlorite solution between each file. The canals were dried with sterile paper points and temporized with cotton pellets and IRM (Dentsply, USA). Approximately 1 wk later, the patient was free of pain. When all of the canals were irrigated, dried, and radiograph was taken with master cones length, the canals were obturated by lateral condensation with AH Plus sealer (Dentsply, USA) and fine-fine accessory cones (Hygienic, Akron, OH). Then, a postobturation radiograph was taken (Fig. 3). But, slight extruding of sealer was observed in an accessory canal of palatal root. The restoration of tooth was made with a composite resin restoration. When the patient was reviewed after 1 year, there was not any abnormality detected radiologically and clinically (Fig. 4).

Discussion & Summary

For a successful root canal treatment, it is essential to reach, clean and shape the root canals properly before a hermetic filling. Root canal treatment has shown that the tooth anatomy is highly variable. Many of the difficulties found in root canal treatment are due to this variation in root canal morphology^[1,2].

The possible anatomic configurations of maxillary premolars are well documented in different populations^[7-9]. But, in the literature were presented only a few cases related to three rooted maxillary first premolar teeth. Our article has described the clinical management of first premolars with three canals and three separate roots.

Visualization of three-canalled maxillary premolars on preoperative radiographs can often be difficult. This root canal configuration resembles that of a miniature three-canalled maxillary molar; the canals being classified as the mesiobuccal, distobuccal, and palatal canals. The less frequent three-canalled configurations with one or two roots are more difficult to envision on preoperative radiographs, but usually have a canal orifice location on the pulp chamber floor which is similar to that of maxillary premolars with three-roots. Often it is helpful to examine radiographs of contralateral teeth when suspecting complex root canal configurations^[8]. But, in the presented case report, on contralateral maxillary first premolar tooth's periapical radiograph was not observed three root. Three rooted configuration can be sometimes seen on preoperative radiographs. In our case,

diagnostic periapical radiograph revealed a three separate rooted maxillary first premolar. Thus, it was not difficult to find canal accesses. But, in some clinical cases, during the treatment of three-rooted maxillary first premolars, the buccal orifices were reported to be close to each other and therefore, it can be hard to locate^[2]. The three-canalled maxillary premolar requires an access cavity modification into a "T" shape, mesial-distally extending the buccal aspect of the usual outline form. This modification allows good access to each of the two buccal canals^[8].

In the presented case report, when the patient was reviewed after 1 year, there were no clinical symptoms or radiological changes such as periapical lesion; however, extruded sealer in an accessory canal of palatal root has not resorbed. Further recalls will continue for this clinical case.

As a result, the knowledge of variations will assist the dentist in reaching conclusions when diagnosing and treating endodontic cases. The possibility of presence of multiple canals and additional roots in cases should be carefully explored and treated.

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Legends

- Fig. 1: Periapical radiograph, showing three root canals.
Fig. 2: Working length radiograph.
Fig. 3: Periapical radiograph, following the obturation of the three root canals
Fig. 4: Periapical radiograph, after 1 year

