

Treatment of a Young Permanent Maxillary First Molar with Two Palatal Roots

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Abstract

The maxillary first molar usually has single palatal root. Incidence rate of maxillary first molar with two palatal roots is especially rare. We reported a case of young maxillary first molar with two palatal roots in this article.

Anatomic characteristic of permanent maxillary molar is generally described as a group of teeth with three roots, one palatal and two buccal but the root canal system is complexed. The second mesiobuccal root was common finding of the teeth studied, the second distobuccal and palatal root was rare [1]. We reported the unusual variation in root and canal morphology of one four-rooted maxillary first molar with two palatal roots.

Keywords: Maxillary first molar; Two palatal roots; Carious lesion; Apexification

canals were densely covered with fillings. Finally, the patient was referred to the restorative department for final restoration.

Case Report

A ten-year old girl was referred to stomatological hospital of Jiangsu province with a history of toothache in the right maxillary region in March 16th, 2014. The patient's medical history was non-contributory. Clinical examination revealed an extensive distal obturation with secondary carious lesion in the right maxillary first molar and tenderness to percussion, with negative response to cold testing. The preoperative radiographic views revealed four roots with open apical foramen (Figure 1). The tooth was diagnosed with symptomatic apical periodontitis.

The patient was prepared for apexification. The access cavity of the maxillary first molar is usually triangular in shape. In the current case, the pulp chamber of this tooth was broader in the palatal areathe access cavity was prepared in trapezoidal shape. Apexification was performed and the root canals were cleaned and shaped under the copious irrigation with 3% H₂O₂ solution and normal saline. In the intraoperative radiographic views, the gutta-percha was put in the root to reveal the length of the roots (Figure 2). Then calcium hydroxide paste was placed in the root and zinc oxide ointment enveloped the tooth for a week. Then roots were filled with vitapex cataplastm MORITA, Japan and the pulp chamber was filled with zinc phosphate cement and glass ionomer. The patient reviewed once three months in regular. The periodic radiographic views (Figure 3) in February 16th, 2016 revealed apical barriers had sealed the apical foramen. Thus the patient was ready for endodontic treatment. The glass ionomer and zinc phosphate cement was removed and the root canals were cleaned and shaped using #15 and #20 stainless steel hand K-files, and Pro Taper nickel-titanium rotary instrumentation (Dentsply Maillefer, Switzerland) with crown-down technique up to X2 under the copious irrigation with 1% sodium hypochlorite. After a final ultrasonic rinse, the root canals were dried and the canals were obturated with gutta-percha and AH-plus sealer (Dentsply, De Trey, Konstanz, Germany) using the lateral compaction technique and orifices were sealed (Figure 4). The postoperative radiographic views (Figure 5) revealed the root



Figure 1: Preoperative radiography.

Discussion

The maxillary first molar usually has only one palatal root. The present manuscript reported a maxillary first molar with two separate palatal roots and two buccal roots. The knowledge of root canal anatomy is the most important aspect for the successful root canal therapy. Finding all of the canals is essential for the success of the endodontic case, if clinicians fail to identify their presence, especially when the prevalence of the root is rare, nontreatment of the roots may lead to failure of root canal therapy. A large number of reports [2,3] showed the morphological variations of the root canal system of the maxillary molars.



Figure 2: Intraoperative radiography.



Figure 3: Radiograph after apexification.



Figure 4: Four canal orifices.



Figure 5: Postoperative radiograph.

Maxillary first molar has complexed root canal anatomy. Zheng et al. found that the mesial buccal root of maxillary first molar has higher incidence of double root: 52.24%, distal buccal and palatal root has lower incidence of double root, respectively, 1.12% and 1.76% [4]. And Yang found that the maxillary molar has [0.72% (14/1957)] incidence of palatal double root, palatal double root of the maxillary second molar incidence [1.12% (11/979)] is higher than the first molar [0.31% (3/978)] [5].

In clinical work, to detect presence of additional root, the clinician should not only be familiar with variations of root canal system, but also take care of the anatomic characteristic of the teeth, such as extra cusp and pulp chamber, additionally use radiographic examination and CT scan.

Conclusion

The variations in the anatomy of root canals have an important role in endodontic therapy. Clinicians ought to be aware of the possibilities, as nontreatment of one canal could lead to endodontic failure.

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