Case Report

Endodontic Management of a Maxillary First Molar with Two Palatal Canals and Three Mesiobuccal Canals: A Case Report

Heshmattollah Shahraki Ebrahimi, Vida Masserat, Sahar Soltani, Hani Bazyar
1Professor assistant in Zahadan University of dentistry-endodontics department, Iran
2Professor assistant in Zahadan University of dentistry-radiology department, Iran
3Post graduate endodontics student in Zahadan University of dentistry, Iran
4Endodontists, Iran

*Corresponding author
Arezoo hooshmandi
Email: hooshmandi_arezoo@yahoo.com

Abstract: This case report is presentation of a maxillary first molar requiring root canal treatment which had two palatal canals and three mesiobuccal canals. Root canal treatment was performed using mechanical instrumentation with NiTi files. This case demonstrates an uncommon anatomical variation. The purpose of this article is to emphasize on the importance of having a thorough knowledge about the root canal anatomy.

Keywords: anatomical variations, maxillary molars, number of canals.

INTRODUCTION

Canal morphology knowledge and its frequent variations is essential for endodontic therapy. These morphological variations in root canal anatomy play a significant role in the outcome of root canal therapy. The most common causes of treatment failures in permanent maxillary first molars is related to failure in detecting additional canals particularly in the mesiobuccal root [1]. Studies reported that the incidence of extra root canals in mesiobuccal root in vitro is greater than in vivo. Many of these in vitro studies of the mesiobuccal root canal anatomy reported the presence of a second canal but very few mentioned a third canal [2-4]. Two such studies reported their incidence to be between 1.1% and 10% [5, 6].

A case study of 140 extracted maxillary teeth showed three mesiobuccal canals in one tooth [7]. Ferguson and Favieri et al.: reported maxillary molars with three mesio-buccal canals with surgical operating microscope [8,9]. Adanir also reported a case with four roots and six canals [10]. Martinez-Berna and Ruiz-Badanelli and Beatty reported the maxillary first molar with three separated mesiobuccal canals with three separated foramina [11, 12]. Kottoor et al.; reported two maxillary first molars with three mesiobuccal canals in each tooth with Cone Beam Computed Tomography (CBCT) [13, 14].

The frequency of two palatal roots is low, a few cases have been reported in the literature. Bond et al.; [15], de Almeida-Gomes et al.; [16] Karthikeyan and Mahalaxmi(4 cases) [17], Albuquerque et al (3 cases) [18], Kottoor et al.; [13] reported two palatal canals in maxillary first molars.

CASE REPORT

A 33-year-old male patient referred to the Department of Endodontics of zahadan University of Dentistry for root canal treatment of right maxillary first molar (tooth no. 3), with a chief complaint of “my tooth had pain.” There was no significant finding in his medical history. Clinically the tooth had a deep carious lesion on the distoocclusal surface.

The tooth was tender to percussion. There was no mobility and periodontal status was within normal limits. Pulp vitality testing of the involved teeth with cold (DENRONIC, AeronovaGmbH & Co. KG, Germany) and electric pulp stimulation (Parkel Electronics Division, Farmingdale, NY, USA) were positive, so the provisional diagnosis was irreversible pulpitis with acute apical peridontitis so root canal therapy of the first maxillary molar was necessary.

After explaining the procedure, the informed tnesnoc was taken from the patient. The patient received local anesthesia of 2% lidocaine with 1: 80000 epinephrine (Persocaine-E, Darou Pakhsh, Iran). After removing caries of the tooth, a conventional endodontic access cavity was made. Rubber dam was placed. Clinical examination with a DG-16 endodontic explorer (Hu-Friedy, Chicago, IL, USA) revealed 4 distinct orifices: two palatals with one mesio buccal orifice and
one distobuccal orifice. The conventional access was modified to a trapezoidal shape to improve access to the palatal canals and extended to explore the likely second mesiobuccal canal. Surprisingly, we found two mesiobuccal canals other one we found before.

After scouting the canals with no.10 and no.15 K-files (Mani INC, Tochigi, Japan), coronal flaring with Protaper Universal Shaping file Sx and S1 (Dentsply, Maillefer, Switzerland) was done. Working lengths were estimated with an apex locator (Root ZX, J. Morita Mfg Corp, Kyoto, Japan) and it was confirmed with periapical radiography (Figure 2). The canals were initially instrumented to a size no.15 K-file (Mani INC, Tochigi, Japan), under copious irrigation with 5.25% sodium hypochlorite. Canal preparation was performed using the crown-down technique with Protaper Universal Rotary NiTi files (Dentsply, Maillefer, Switzerland).

Figure 3 shows the radiography of the pulp chamber after instrumentation. Final irrigation was done with 20 ml EDTA 17% then 20 ml sodium hypochlorite 5.25% followed by 20 ml normal saline irrigation. The canals were dried with paper points. Canals were obturated using cold lateral compaction of gutta-percha (GAPADENT Co. LTD, China) and AH 26 sealer (Dentsply Tulsa).
Fig-5

(Figure 5, 6) is final radiography of root canal treatment. Cavit was used as a temporary filling material. Patient was referred to restorative department.

DISCUSSION

This case is considerable because it has two palatal canals in a palatal root and three mesiobuccal canal. A thorough literature search in PubMed site was done by the author revealed that the present case is apparently the first reported case of endodontic management of a maxillary first molar with three mesiobuccal canals and two palatal canals that was reported.

Kottoor et al.; reported two maxillary first molars with three mesiobuccal canals in each tooth with Cone Beam Computed Tomography (CBCT) [13, 14]. The frequency of two palatal roots is low; a few cases have been reported in the literature. Radiographic examination is a necessary part of the management of endodontic problems. Confirmation of this unusual morphology by CBCT is use full but we did not use CBCT because of ethic and economic issues related to the patient.

CONCLUSION

The present case report is about the endodontic management of an unusual case of a maxillary first molar with three roots and six canals and also highlights the importance of finding additional canals particularly in the mesiobuccal root. Most common causes of treatment failures in permanent maxillary first molars are related to failure in detecting additional canals.

REFERENCES