ENDODONTIC MANAGEMENT OF MANDIBULAR FIRST PREMOLAR WITH THREE ROOT CANALS: A CASE REPORT
Hengameh Ashraf, Payam Paymanpour, Maryam Mojtahed Bidabadi

ABSTRACT
A mandibular premolar with three canals is quite rare with a reported incidence of 0.5% and requires special canal preparation and obturation techniques. This paper reports the endodontic management of a mandibular first premolar with three root canals.

Keywords: Endodontic Therapy; Mandibular Premolar; Multiple Root canal

Introduction
The mandibular first premolar had one canal at the apex in 74.0% of the teeth, two canals at the apex in 25.5%, and three canals at the apex in 0.5% of the teeth. The presence of three root canals in the mandibular premolar may sometimes be recognized when there is persistent postoperative discomfort following root canal therapy. The possibility that there is more than one root canal in lower premolar teeth must be considered in the radiographic and clinical examination during root canal treatment. A higher number of extra canals in mandibular premolars of African descent has been reported compared with Caucasian patients. International studies have shown the existence of second or third canal was noted in only 23.1% of first mandibular premolars and in only 12.1% of second mandibular premolars. This paper reports the endodontic management of a mandibular first premolar with three root canals.

Case Report
A 42-year old female patient was referred from the Dental outpatient clinic to Department of Endodontics, Shahid Beheshti Dental School, Iran for root canal treatment of left first mandibular premolar. The medical history was normal. Patient had undergone dental filling and tooth extraction in the past. The mandibular first premolar was asymptomatic. Clinical examination reveals multiple restoration and partial edentulous region followed by the multiple extractions in the past. The tooth was non-tender on percussion with a composite restoration on the crown. The electric pulp testing was negative suggesting pulp necrosis. The probing depth was in normal limits. Intra oral periapical radiograph of 34 had a periapical radiolucent lesion with loss of lamina dura with a defective coronal restoration (Figure 1). The radiograph revealed an extra canal, which was diverged distally from the main canal with a sharp angle. Consent was obtained from the patient and root canal treatment under local anesthesia was planned.

Local anesthesia was established with 2% Lidocaine plus 1:80,000 epinephrine. Rubber dam was applied and access cavity prepared. Coronal pulp tissue was removed and only one orifice was visible. Size #2, #3, and #4 Gates Glidden burs were used for initial opening of canal orifice. Further exploration with a bended #10 and #15 K-files were done at the entrance and divided canals were located. Root canal lengths were estimated with an electronic apex locator. Radiographs confirmed the working length. In this radiograph, trunk of canal seemed to trifurcate at mid-root level giving rise to three separate canals and apical foramina. Sodium hypochlorite (5.25%) was used as endodontic irrigation agent. Apical preparation was performed by using both hand K-files and ProTaper rotary files. Size #15 K-file was used to establish and maintain apical patency during preparation. The canals were prepared with size #30 file. Calcium hydroxide was used as intracanal medicament. The access cavity was sealed with temporary filling.

The tooth was asymptomatic on the follow-up after two weeks. During the follow-up rubber dam was applied and coronal temporary filling was removed. 5.25% sodium hypochlorite was used for removing intracanal calcium hydroxide and root canal irrigation. The canals were dried with paper points and obturated with gutta-percha and AH26 Sealer using lateral compaction technique and access cavity was sealed with temporary filling. The post obturation radiographic examination showed a distal canal diverged from main canal more coronally than mesial canal, which divided into two distinct canals at apical one third (figure 2). On thirdmonth follow up, patient was asymptomatic (Figure 3) and sixth month radiograph showed significant healing (Figure 4).

Discussion
The morphology of the root and root canals has been reviewed extensively in literature. The prevalence of one, two and three canals has been reported in vitro and in vivo. Bellizi and Hartwell recognized the presence of three rooted premolar after endodontic therapy, when persistent post operative pain had to be evaluated. The mandibular first premolar had one canal at the apex in 74.0% of the teeth, two canals at the apex in 25.5%, and three canals at the apex in 0.5% of the teeth.

These variations in pulpal anatomy must be considered at the beginning of endodontic treatment. Possibility that there is more than one root canal in lower premolar teeth should always be expected. Electronic apex locators are useful adjuncts for determining working length in all cases, particularly complex anatomical variations. Use of both of electronic devices and angled radiographs provides greater accuracy. In this case, a single broad root canal trifurcated into three separate root canals was noticed. Dental operating microscope provides magnification and illumination which improves the ability to locate and negotiate canals.
In conclusion even though the incidence of first mandibular premolars with an unusual anatomical configuration is rare each tooth should be investigated, clinically and radiographically to detect possible anatomical variations before commencement of endodontic treatment, to enhance good prognosis.

Conclusion

References


How cite this article


Address for correspondence

Maryam Mojtahed Bidabadi DDS, Post Graduate Student, Department of Endodontics, Shahid Beheshti University of Medical Science, Tehran, Iran.

Email: maryam.mojtahed@yahoo.com

Source of Support: Nil

Conflict of Interest: None Declared