

Endodontic management of mandibular premolar with two roots & two root canals: A case report

Dr. Radhika S. Rathi

Government Dental College and Hospital, Aurangabad, Maharashtra

Abstract

Mandibular premolars commonly have single root with single root canal system. Complex root canal system with different variations is a common finding among mandibular premolars. However various studies related to anatomic variations of mandibular premolar have been reported. The clinician should be aware of the configuration of the pulp system for the successful endodontic treatment. The incidence of two roots in mandibular premolar teeth are quite rare. This report presents the clinical management of mandibular premolar having two roots bifurcated at the midroot level.

Keywords; Mandibular premolar, 2roots, Anatomic variation

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I. Introduction

Knowledge of basic root and root canal morphology as well as possible variation in anatomy of the root canal system is important for successful nonsurgical root canal treatment. This is followed by access opening, cleaning and shaping and obturation of the entire canal system in three dimensions. Numerous reports of root canal variations in these teeth have been reported in the literature. Vertucci in his series of studies conducted on extracted teeth, reported 2.5% incidence of a second canal. Zilich and Dawson reported 11.7% occurrence of two canals and 0.4% of three canals. According to Ingle, mandibular second premolars have only 12% chance of a second canal, 0.4% of a third canal and Hartly has reported 11% possibility of second canal. In most instances they have had one canal, but teeth with two or more canals have also been reported. This case report presents endodontics management of a mandibular second premolar with two roots & two canals.

II. Case Report

25 years male reported to Department of Conservative Dentistry & Endodontics with chief complaint of pain in lower right back region of jaw. On clinical examination deep distal caries with 45 (Figure 1). Patient gave the history of night pain since 2 days. Pain was spontaneous in nature and aggravated on chewing and lying down. Radiograph of the same tooth revealed a large radiolucency in the crown portion with no periapical lesion. It also revealed an unusual pattern of the root suggesting more than one canal (Figure 2). A diagnosis of acute irreversible pulpitis was made and it was decided to carry out endodontic treatment.



Figure 1: Preoperative Intraoral view 45



Figure 2: Preoperative IOPA with 45

The area was anaesthetised with 2% Lidocaine in 1:80,000 Adrenaline, the tooth was isolated with rubber dam. Access opening was done with round and safe-end tapered fissure bur. The second canal was explored carefully with DG 16 explorer. Negotiation of the canals was carried out with ISO size 6, 8, and 10 K files. The working lengths were determined electronically with Apex ID apex locator. Thereafter, the readings of the apex locator were verified radiographically (Figure3). During cleaning and shaping, the root canals were irrigated with copious amounts of 2.5% sodium hypochlorite solution. Buccal and lingual canals were enlarged up to F1 ProTaper Goldfiles. Canals were dried using paper points and the corresponding sized gutta-percha master cones for the two canals were selected (Figure4).



Figure 3: Working length determination iopa with 45



Figure4: Master cone Determination iopawith 45

then obturation was done using Endoseal sealer(Figure5). Postendodontic permanent restoration was performed with amalgam restorative material (Figure6).



Figure5: Immediate Postobturation radiograph with 45

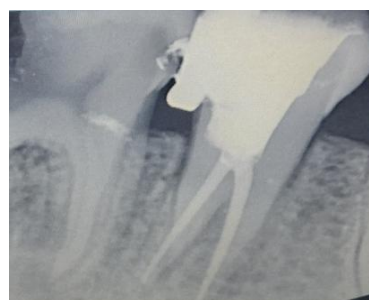


Figure6: 3 Month follow up Postobturation iopa with 45

III. Discussion

Recognition of the different anatomy requires thorough knowledge of the root canal morphology, accurate interpretation of the diagnostic aids, proper assessment of the pulp chamber floor and operative skills of the clinician¹. Studies on the root canal morphology of mandibular premolars have reported a fairly high percentage of these teeth to have more than one canal. Sabala et al and Amos carried out an in vivo study on mandibular premolars. They reported their results on root number and internal canal morphology by the patients treated rather than by the total number of teeth. Mandibular premolar may have more than one canal in a single root or it may have two roots². Slowey has shown that when the root canal shadow suddenly stops in the radicular region on radiograph, bifurcation or trifurcation of the canal at that point should be suspected. Also an additional root canal can be identified when the root outline is unclear or has an unusual contour, or deviates from the normal appearance on radiograph³.

The present case shows two roots with two different canals and two separate foramina. One should never underestimate the complex anatomy of the root canal morphology of mandibular second premolar. Important step required in such canal was a modification in access opening which required an adequate flaring of the canal coronal to the bifurcation for easily passage of instruments into the second canal. Various technique would guide the clinician to diagnose additional roots or canals. Pre-operative radiographs straight and angled using parallel technique would give clues to the number of roots that exist⁴. Yoshioka et al. mentioned that sudden narrowing of the root canal system on a parallel radiograph indicates canal multiplicity.

Microscopes are widely used to explore the pulp chamber and identify the orifices with their better visualization. Also attention to color changes on the pulpal floor and wall during inspection is helpful in locating

orifices. CBCT can be used in endodontics for the evaluation of root canal anatomy⁵. An advantage of computed (CT) scanning over the conventional radiograph is that it allows the operator to visualize multiple sections of the roots and their canals. According to Nance et al. the detection of canals increased significantly by CT scan compared with conventional radiography.

IV. Conclusion

Lack of the knowledge of developmental variations might result in failure of endodontic treatment due to missed canal, however with the advances in modern endodontic techniques and the sound knowledge of complex root canal system can result in successful endodontic treatment.

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