



## Retreatment of 3 Rooted Maxillary First Premolar : A Case Report

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### Abstract

Maxillary premolars have variable root canal morphology, most commonly they are bi-rooted and two canalled teeth but there is a small incidence of being three roots system. In case of three root canals this third canal can be missed easily. In these cases true knowledge of tooth morphology, properly evaluate diagnostic x-rays and access cavity preparation could help successful root canal treatment. This article reports retreatment of three root canalled maxillary first premolar and treatment principles.

**Keywords:** Maxillary First Premolar, Root Canal Morphology, Retreatment

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The success of non surgical root canal treatment is dependent on the through knowledge of the root canal morphology. Many difficulties found in root canal treatment due to variations in root canal morphology. Extra roots are an additional challenge. These anatomical variations must be considered at the beginning of the case assesment and involves all operative stages including cavity design and cleaning-shaping of the root canal system. In case of maxillary first premolar three root canal frequency found between 0.6-6%<sup>(1)</sup>. Neelakantan et al. Found that ratio as 2.2% among Indian population<sup>(2)</sup>. The

anatomy of maxillary premolars with three root canals, mesiobuccal, distobuccal and palatal, is similar to that of adjacent maxillary molars, and sometimes called as small molars or radiculous<sup>(3)</sup>. Despite the low incidence, several studies have demonstrated the existence of three canaled maxillary first premolars<sup>(4, 4-6)</sup>, which considerably makes endodontic treatment difficult. The aim of this paper was to report a clinical case of endodontic retreatment of a three-canaled maxillary first premolar.

### Case Report

The patient; 22 years old male patient who studies dentistry in Ege University Faculty of Dentistry. He had taken a periapical radiograph from his upper left premolar teeth which had root canal treatment few years ago by a general practitioner. On that radiograph improper root canal treatments was seen (**Figure 1**) and decided to renew it. In the diagnostic radiograph maxillary left second and first premolar had short root canal fillings and first premolar showed mesiodistally large root surface. As defined by Sieraski et al. "If the mid root mesiodistal width is equal to mesiodistal width of the crown tooth can be three rooted."<sup>(7)</sup>. We thought that it could be 3 rooted maxillary first premolar.

At the first appointment; Access cavity was prepared to the maxillary first premolar. Old restoration and gutta percha remnants was removed. Two buccal and one palatal canals were localized. Root canal lenght was determined by Propex II (Dentsply Maillefer, Tulsa, OK, USA) apex locator . Root canals were cleaned and shaped with Reciproc (25/0.08, VDW, Munich, Germany). Calcium hydroxide was used as an intracanal medicament. 2 weeks after calcium hydroxide was removed, in sequence all root canals irrigated with; EDTA(5%), NaOCl (2.5%), distilled water and chlorhexidine digluconate (2%). Root canals dried with paper points and obturated with Reciproc gutta percha and MM Seal (MicroMega,France) root canal sealer (**Figure 2**).

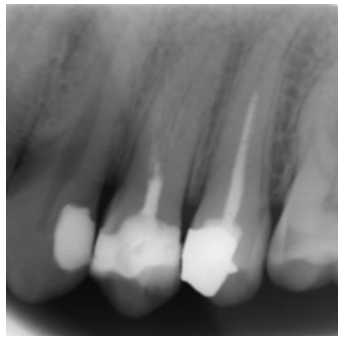


Figure 1: Preoperative radiograph

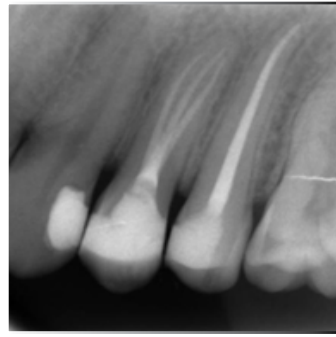


Figure 2: Post operative radiograph

## Discussion

An accurate diagnosis of the anatomy of the root canal system is a prerequisite for successful endodontic treatment. Precise determination of the internal structure of teeth, their form and number of root three-dimensional canals is a challenge. High quality preoperative radiographs and their careful examination are essential for the detection of additional root canals<sup>(8)</sup>. Two radiographic signs can indicate presence of three rooted maxillary premolars. One of them is if the middle third of the root has a mesiodistal distance equal or greater to mesiodistal width of the crown, the other one is; the rapid disappearance of the continuity of radiolucent image of the root canal<sup>(9)</sup>. Therefore, the radiographic signs that demonstrate the presence of anatomical variations must be considered an important condition when planning the tooth treatment<sup>(9)</sup>.

A third canal can also be suspected clinically when the pulp chamber does not appear to be aligned in its expected bucco palatal relationship<sup>(7)</sup>. If the pulp chamber appears to deviate from normal configuration and seems to be either triangular in shape or too large in a mesiodistal plane, more should be suspected<sup>(10)</sup>.

In this case mid root width on periapical radiograph aided to diagnose three rooted maxillary first premolar tooth. Hand files used to create path for reciprocating system and canal preparations completed with Reciproc (25/0.08) NiTi file. Calcium hydroxide was used as an intracanal medicament because its effect on persistent microbial species. Siqueira et al. showed calcium hydroxide can eliminate cultivable bacteria which single 2.5 NaOCl irrigation could not eliminate<sup>(11)</sup>.

2% chlorhexidine digluconate was used as final irrigant after EDTA, NaOCl and distilled water because of its residual antimicrobial activity. White et al. showed 2% concentration of chlorhexidine digluconate can sustain its antimicrobial activity more than 72 hours<sup>(12)</sup>.

## Conclusion

Having canal anatomy variations through knowledge of root/root is essential for successful endodontic treatment. Clinician should be aware of anatomical variations and presence of an additional canal should be suspected.

## Conflict of Interests

The authors deny any conflict of interests related to this case report.

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