

# Three Canals In The Mesiobuccal Root Of A Maxillary First Molar: A Case Report

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## Abstract

This paper reports the case of a maxillary left first molar that presented three root canals in the mesiobuccal root. Treating extra canals in maxillary first molars may be challenging. Inability to find and properly treat the root canals may cause failures. Complete clinical and radiographic examination and a thorough knowledge of the morphology of these teeth are necessary for successful clinical results.

## INTRODUCTION

A thorough knowledge of the internal dental morphology is a complex and extremely important point for planning and performing endodontic therapy. The several anatomical variations existing in the root canal system may contribute for failure of root canal therapy<sup>1</sup>. Weine et al. (1969) observed that failures related to the mesiobuccal root of maxillary molars jeopardized the success of the endodontic treatment and found that teeth with a fourth canal occurred more frequently than those with three canals<sup>2</sup>.

Smadi and Khraisat (2007) reported that the maxillary first molar has some of the highest failure rates in endodontic treatment. The failure often is due to the presence of a second canal in the mesiobuccal root that the clinician fails to detect, debride and obturate<sup>3</sup>. Modifications in endodontic access and detection techniques, along with advancements in illumination and magnification technology, have aided in the location and treatment of the second mesiobuccal canal of maxillary first molars<sup>4</sup>. A study about dental anatomic variations revealed a high incidence of two canals in the mesiobuccal root of maxillary first molars<sup>5</sup>.

This paper reports the endodontic management of a maxillary left first molar that presented three root canals in the mesiobuccal root.

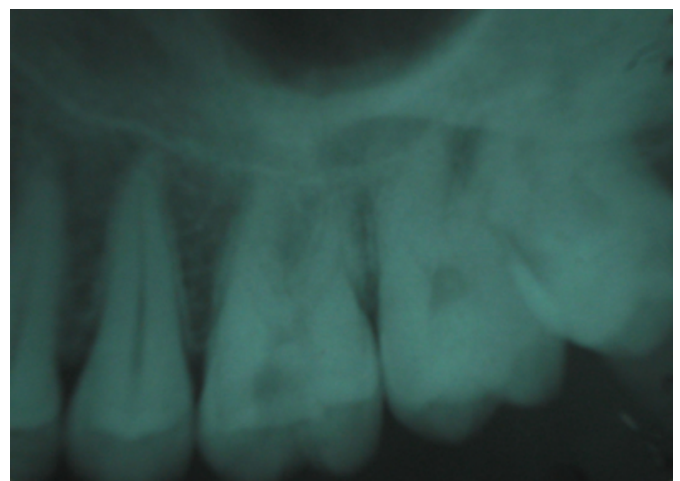
## CASE REPORT

A 28-year-old male patient reported to the Department of Conservative Dentistry and Endodontics with complaint of pain, both spontaneous and to extreme temperatures, on the

left side of the face, two days prior to his visit. The patient's medical history was noncontributory. Clinical examination revealed dental caries in tooth number 26. The tooth was tender on percussion. The periodontal condition of the tooth was normal. On testing for vitality, severe lingering painful response was observed. The reason for this pain was diagnosed to be irreversible pulpitis in the maxillary left first molar. A preoperative radiograph (Fig. 1) was obtained which revealed caries approximating the pulp.

## Figure 1

Fig.1 Preoperative radiograph

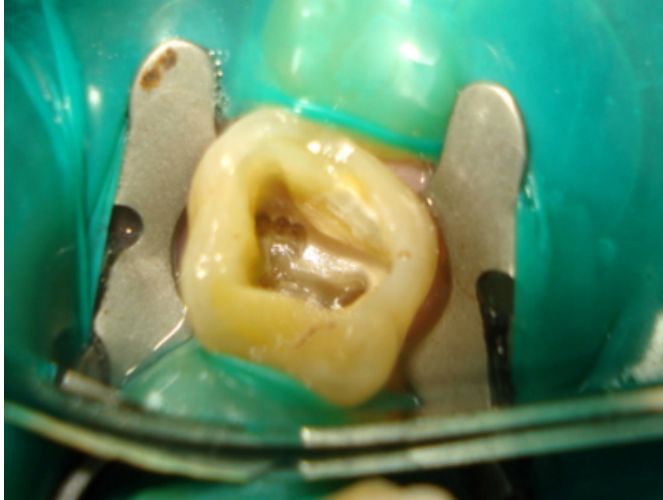


Local anesthetic (Lignocaine 2% & Adrenaline 1:200000, Astra Zenca, Bangalore, India) was administered and the operative field was isolated with a rubber dam. Access cavity prepared and exploration of root canal orifice revealed 3 distinct canals in the mesiobuccal root, 1 canal in the

distobuccal root and 1 canal in the palatal root (Fig. 2).

**Figure 2**

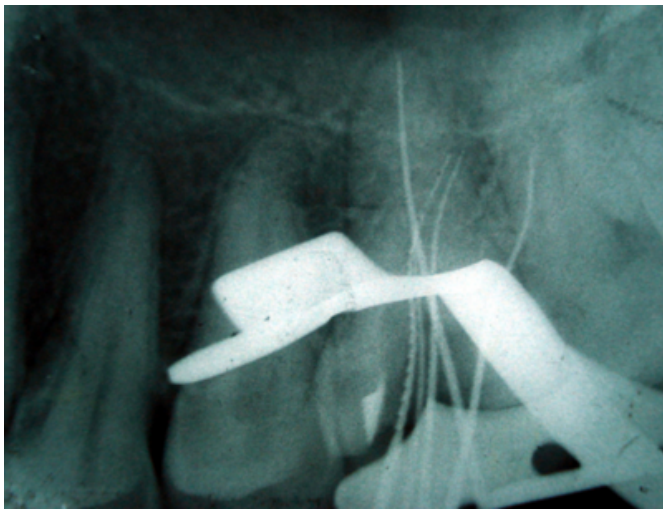
Fig.2. Three mesio buccal canals, the distobuccal and the palatal canal



This was further confirmed by a radiograph for working length determination. (Fig.3)

**Figure 3**

Fig.3. Working length radiograph



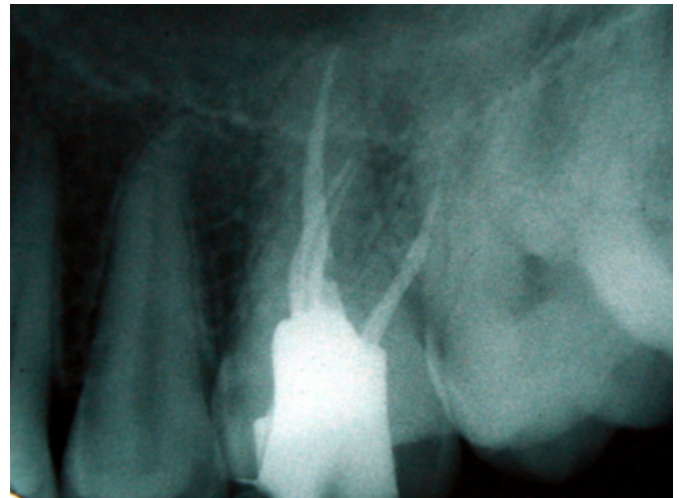
The coronal portions of the canals were prepared using Protaper (Dentsply -Maillefer, Switzerland) system with Shaper X file to improve straight line access. Frequent irrigation with 2.5% Sodium Hypochlorite was carried out. The apical preparation was done using K-type files. Cleaning and shaping was completed using Protaper files S1 and F1.

The canals were flushed with EDTA for 3 min under continuous stirring with a Ni-Ti file, rinsed, dried and filled

with a paste prepared with Calcium Hydroxide and glycerin, which was used as an intra-canal medication. Root canal access opening was sealed with a zinc oxide and eugenol dressing. After 4 days, the canals were emptied, copiously flushed with 2.5% sodium hypochlorite stirring with a #15 Ni-Ti - file (Dentsply) and dried with paper points. Main gutta-percha cones were selected for each canal and all canals were obturated using the lateral condensation technique. A final radiograph (Fig.4) was taken to confirm the completeness and extension of root filling.

**Figure 4**

Fig 4. Post operative radiograph



The tooth was sealed; entrance filling given with Dental Amalgam and the patient was referred for restorative treatment.

**DISCUSSION**

The morphological variations in root canal anatomy play an important role in root canal therapy. A great predominance of two very close canals in the mesio buccal root of maxillary molars has been demonstrated<sup>6</sup>. Despite the high success rate achieved in endodontic treatment, the mesio buccal root is still associated to a considerable number of failures due to the difficulty in locating and filling the second and/or third mesio buccal canals<sup>7</sup>.

Thus, root canal therapy of these teeth should be carried out by using x-rays from different angulations, efficient explorers, wider access openings, adequate illumination and, whenever possible, image magnification<sup>8</sup>. In the present case reported in this paper, the mesio buccal root presented a moderate curvature with three atresic canals. The mesio buccal canal-1 had one opening and one exit (Vertucci's Type -I), while the mesio buccal canal-2 and the

mesio palatal canal presented two openings and one exit (Vertucci's Type-II)<sup>1</sup>. Necessary precautions have to be taken during root canal therapy of these teeth and hence instrumentation of these canals was carried out using nickel titanium files, due to their flexibility, lesser risks of ledge formation and perforations<sup>9</sup>.

### CONCLUSION

Treating extra canals in the maxillary molars is a challenging task for the clinicians. Inability to identify and treat these additional root canals may cause treatment failures. With the advent of latest diagnostic technology like, surgical endodontic microscope, magnification loupes, ophthalmic dyes, ultrasonic tips, Spiral computed tomography and Radiovisiography, detection of extra canals have become much easier. It is the responsibility of the clinician to identify additional canals particularly in maxillary molars, and search should be made with utmost care in recognizing and treating these extra canals. An adequate knowledge of morphological variations of the complex root canal system and application of latest technology will help the clinician to achieve a high percentage of success in such cases.

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