



ISSN Print: 2394-7489  
ISSN Online: 2394-7497  
IJADS 2020; 6(3): 183-185  
© 2020 IJADS  
[www.oraljournal.com](http://www.oraljournal.com)  
Received: 20-06-2020  
Accepted: 21-07-2020

**Srishti Pandey**

Post-Graduate Student, MGV's  
KBH Dental College and  
Hospital, Nashik, Maharashtra,  
India

**Meenal Gulve**

Principal And HOD, MGV's  
KBH Dental College and  
Hospital, Nashik, Maharashtra,  
India

**Swapnil Kolhe**

Professor, MGV's KBH Dental  
College and Hospital, Nashik,  
Maharashtra, India

**Gayatri Aher**

Reader, MGV's KBH Dental  
College and Hospital, Nashik,  
Maharashtra, India

**Corresponding Author:**

**Srishti Pandey**

Post-Graduate Student, MGV's  
KBH Dental College and  
Hospital, Nashik, Maharashtra,  
India

## Management of mandibular second molar with three distal canals: A case report

Srishti Pandey, Meenal Gulve, Swapnil Kolhe and Gayatri Aher

### Abstract

A rare case of mandibular second molar with three distal canals has been described. Literature pertaining to unusual root canal morphology is reviewed and thorough examination of the pulp chamber floor for easy, simplified and successful non-surgical root canal treatment is recommended.

**Keywords:** Five canals, mandibular second molar, middle distal canal

### Introduction

The main objective of root canal therapy is thorough cleaning and shaping of all pulp spaces and its complete obturation with an inert filling material <sup>[1]</sup>. The knowledge of root canal anatomy has a major influence on the success rate of endodontic treatment <sup>[2]</sup>.

In dental practice, mandibular molars are the most frequently encountered teeth that undergo endodontic treatment. The mesial root of a mandibular molar commonly presents a mesiobuccal (MB) and a mesiolingual (ML) canal, while the distal root more often contains one canal rather than two. A narrow connection which also contains pulp tissue, the isthmus, is present between two mesial or distal canals. This isthmus area leads to anatomical variations such as middle canals <sup>[3]</sup>. Vertucci and Williams first reported the presence of a middle mesial (MM) canal in a mandibular molar <sup>[1]</sup>. Beatty and Krell documented a mandibular first molar and a mandibular second molar with five canals <sup>[4]</sup>. As per literature, incidence of five canals with three distal canals in the mandibular second molar is very rare in comparison to presence of three mesial canals in mandibular first molar. The present case of mandibular second molar is unique with three distal canals and two mesial canals.

### Case Report

A 36-year-old female patient presented with a complaint of pain in mandibular right second molar. A radiograph revealed proximo-occlusal caries associated with mandibular right second molar. Her medical history was non-contributory. Periodontal probing was within the normal limits. The mandibular right second molar was hypersensitive to cold. The involved tooth gave exaggerated response to electric pulp tester in comparison to the adjacent contralateral tooth. A pre-operative radiograph was taken of mandibular right second molar (Figure 1). A diagnosis of an acute irreversible pulpitis was made for the mandibular right second molar. Endodontic treatment was planned for the tooth.

### First Visit

Detailed procedure was explained to the patient and written consent was obtained. Local anaesthesia was administered using 2% lignocaine containing 1:100,000 epinephrine (Lignox 2%; Warren, India) and rubber dam isolation was done. After achieving anaesthesia all carious tissue was removed and an adequate endodontic access was made. After pulp extirpation and copious irrigation of the pulp chamber, upon careful examination with endodontic explorer (DG-16 Hu-Friedy, Chicago, IL, USA), the pulp chamber disclosed five canal orifice, (Figure 2) two in mesial root (mesiobuccal, mesiolingual) and three in distal root (distobuccal, middle distal and distolingual). Working lengths were estimated by using an electronic apex locator (Root ZX; Morita, Tokyo, Japan) using size #15 K-file (Mani, Tochigi, Japan) and then confirmed with radiographs (Figure 3). The root canals were prepared using crown-down technique <sup>[5]</sup>.

All the canals were cleaned and shaped using HERO shaper (Micro-Mega, Besancon, France) file system. Each mesial canal were prepared upto #25.04 and each distal canals were prepared upto 30.04. Copious irrigation was performed with 5% sodium hypochlorite (Prime Dental Products, Pvt., Ltd., India) and saline between each instrument change. The canals were dried with paper points and Ca(OH)<sub>2</sub> intracanal medicament (Prime Dental Products, Pvt., Ltd., India) was placed. The cavity was sealed with zinc oxide eugenol temporary restorative material.

### Second Visit

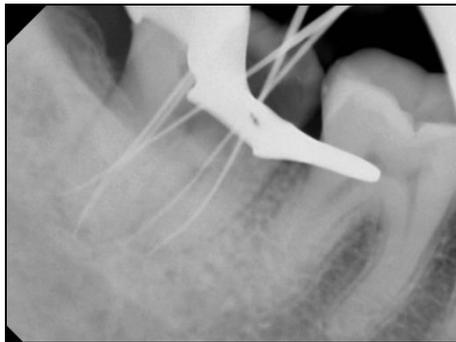
At the second appointment, after isolation with rubber dam all the canals were recapitulated, irrigated, dried. Master cones for all five canals were selected and radiograph was taken (Figure 4). Upon verification of master cone length, the canals were obturated by using gutta-percha and Sealapex sealer (Sybron Endo, Sybron Endo Specialities, Glendona, CA, USA). A post-obturation radiograph was taken (Figure 5) and the cavity was restored with composite restoration.



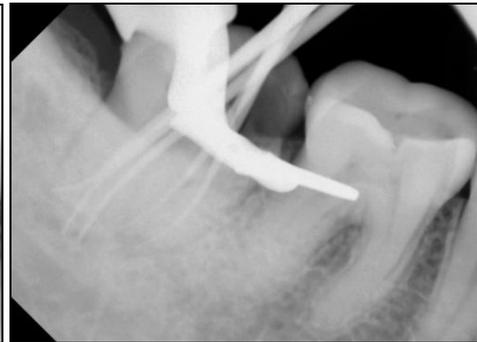
**Fig 1:** Pre-operative radiograph



**Fig 2:** Access opening of the teeth



**Fig 3:** Working length determination



**Fig 4:** Master cone selection



**Fig 5:** Post-obturation radiograph

### Discussion

Morphologic variations and aberrations in root canal anatomy should always be considered at the beginning of treatment [9]. To minimize the risk of endodontic treatment failure, a precise knowledge of the root canal morphology is vital [1]. Root canal anatomy and root morphology may have definitive racial influences, thereby necessitating the identification of root canal morphologies of different races [6]. Studies on the root canal anatomy of mandibular first and second molars have been performed on several populations [6, 7]. A higher

number of mandibular second molars with single roots have been found in Mongoloid populations and C-shaped canals have also been found more frequently in the same populations [9]. The Indian race is typically considered to be a hybrid of several races with a characteristics of Caucasian, Mongoloid and Negroid races [10]. Neelakantan *et al.* characterized the root morphology and number of roots and root canals in mandibular second molars in an Indian population [9].

A comprehensive survey of the endodontic literature reveals that the mandibular first molar presenting with 3 canals in the distal root is a rare phenomenon. Mandibular first molar with three distal canals was first reported by Berthiaume in 1983 [3]; however, the three distal canals ended in two apical foramina [11]. In the present case, Vertucci's classification type VIII canal configuration was seen in the distal root. The distal root had three canals with three orifices, all the three orifices had three distinct apical opening.

### Conclusion

This case report presents a case of mandibular second molar with five canals opening in five distinct apical foramen. It is essential that the clinician must be aware of the internal anatomy. A thorough knowledge of possible variations in internal anatomy of human teeth is important for successful endodontic treatment.

**References**

1. Vertucci FJ. Root canal anatomy of the human permanent teeth. *Oral Surg Oral Med Oral Pathol.* 1984; 58:589-99.
2. Neelakantan P, Subbarao C, Subbarao CV, Ravindranath M. Root and canal morphology of mandibular second molars in Indian population. *J Endod.* 2010; 36:1319-22.
3. Barker BC, Lockett BC, Parsons KC. The demonstration of root canal anatomy. *Aust Dent J.* 1969; 14:37-41.
4. Beatty RG, Krell K. Mandibular molars with five canals: Report of two cases. *J Am Dent Assoc.* 1987; 114:802-4.
5. Marshall FJ, Papin J. A crown-down pressureless preparation root canal preparation technique. *Technique manual.* Portland: Oregon Health Sciences University, 1980.
6. Walker RT. Root form and canal anatomy of mandibular second molars in southern Chinese population. *J Endod.* 1988; 14:325-9.
7. Younes SA, al-shimmery AR, el-Angbawi MF. Three-rooted mandibular first molars of Asian and black groups in the Middle-East. *Oral Surg Oral Med Oral Pathol.* 1990; 69:102-5.
8. Vemisetty HK, Polavarapu VR, Anantula K, Dandolu R. Mandibular second molar with five canals. *J NTR Univ Health Sci.* 2014; 3(S1):43-6.
9. Neelakantan P, Subbarao C, Subbarao CV, Ravindranath M. Root and canal morphology of mandibular second molars in an Indian Population.
10. Reich D, Thangaraj K, Patterson N, Price AL, Singh L. Reconstructing Indian population history. *Nature.* 2009; 461:489-94.
11. Berthiaume JT. Five canals in a lower first molar. *J Mich Dent Assoc.* 1983; 65:213-4.