

## Mandibular 2nd Pre Molar With Two Roots And Three Root Canals - A Case Report

### Abstract

Anomalies are commonly occurring phenomenon. For successful completion of the non-surgical root canal treatment, a thorough knowledge of root canal anatomy and its variations is necessary. Normal root and root canal anatomy of mand. 2nd pre-molar is well documented in various text books but there is a great deal of variation in the reporting of the incidence of anomaly. Incidence of two separate roots in this tooth is rare. This paper attempts at explaining the successful management of rare case of mand 2nd pre-molar with three root canals with an overview of type and number of common anatomic forms.

### Key Words

knife edge ridge, differential pressure impression technique.

### Introduction

Knowledge of root canal morphology and possible variations in the anatomy of root canal system is important in the successful management of non-surgical root canal treatment followed by negotiation, cleaning and shaping (Ingle J, 2ND Ed 1976)<sup>1</sup>

Incomplete instrumentation followed by incorrect obturation is most common cause of failure of as reported by Ingle. Mandibular 2nd pre-molar is typically described as a single rooted tooth with root canal system in text books. There are also numerous case reports and anatomic studies that have reported variations.

Incidence of number of roots and number of root canals reported in anatomic studies varies greatly in literature.<sup>2,3</sup>

Vertucci in his series of studies conducted on extracted teeth reported 25% incidence of 2<sup>nd</sup> canal<sup>4</sup>.

Zilich and Dawson reported 11.7% occurrence of two canals and 0.4% of three canals<sup>5,6</sup>.

Case of mand. 2<sup>nd</sup> pre-molar with three canals have been reported by Kaffe I, Kaufmann AY et al 1985, Singh RP, Stamps HF et al 1987, Chan K et al 1992, Fisher 1992, De Moor RJ 2005, and Nallapati 2005. Atypical occurrence of three canals in 2<sup>nd</sup> pre-molars with two orifices distal half of furcation area and one orifice on mesial wall

of pulp chamber has been reported by De Moor et al<sup>7</sup>. Various factors like ethnicity, age and gender that can contribute to the differences observed in various anatomic studies have been reported by Troop M, Tronstad I in 1986<sup>5</sup> and Sert S et al 2004<sup>8</sup>. Apart from morphological studies, frequent case reports have shown unusual root canal variation many of which have been attributed to fusion, germination or concrescence. Present case report is of mandibular 2<sup>nd</sup> pre-molar with three root canals. The discussion has been based on the significance of such a finding.

### Case Report

45 years old male patient reported for the treatment of pain in mandibular right side for last three days. Clinical examination revealed deep disto-occlusal caries with definite pulp involvement. The tooth was tender to percussion. Endodontic treatment was planned for this tooth. Pre-operative radiograph were taken. Careful examination of radiograph showed the presence of two roots and two root canals. Third root canal was not visible because of superimposition. Treatment was started by giving anesthesia using 2% lidocaine with 1:1,00,000 adrenaline. Endodontic access cavity was prepared through occlusal surface and roof of pulp chamber was removed.

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Examination showed pulp chamber wide mesio-distally showing two root canals, one mesial and one distal. Continued careful examination to rule out any possibility of additional canal revealed the presence of third root canal in distal root. All three canals were thoroughly instrumented and shaped and obturated with laterally condensed gutta percha using AH plus root canal sealer. Temporary restoration was placed and radiograph was taken. Patient was called after one week for permanent restoration.

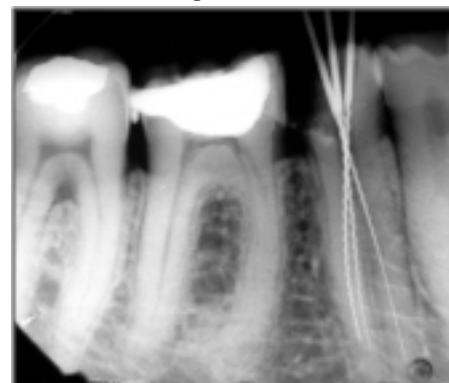


Fig : 1

### Discussion

Thorough mechanical cleaning of entire pulp cavity and complete obturation with inert material is main objective of the successful root canal treatment. This objective can not be achieved without



Fig : 2

thorough knowledge of root canal anatomy , careful interpretation of radiograph and proper modification of access cavity essential for recognition and management of anatomical variations<sup>9</sup>.

Mandibular 2<sup>nd</sup> pre-molar is described as a single rooted tooth with single root canal system. The ovoid shaped root in cross section has developmental grooves or depressions on mesial and distal surfaces. The incidence of two separate roots in this tooth is very rare. Often considered an enigma to endodontist, mand. 2<sup>nd</sup> pre-molar with more than one root and root canals dividing at various levels of the root can generate complex problems.

In the case presented here, two roots with three root canals were identified. Failure to identify 2<sup>nd</sup> and 3<sup>rd</sup> root canal might have resulted in incomplete treatment and failure. Morphological structure in this case is similar to morphological structure studied by Moayedi S , Lata DA and Sanjeev Tyagi et al<sup>10</sup>.

All these cases involved mand. 2<sup>nd</sup> pre-molar with two root canals and identical numbers of distribution of root canals. Such similarity should warrant that internal morphology must be identified precisely to identify supplementary root canals or root canal aberrations to achieve successful treatment.

Pulpal floor anatomy and good quality radiograph at different angles is necessary to accurately diagnose the no. of roots and root canals in 2<sup>nd</sup> pre-molars.

Martinez -Lozano et al<sup>11</sup> have suggested 40<sup>o</sup> mesial angulation of x-ray beam to identify additional canals. Buhrlay L J et al<sup>12</sup> and Sempira et al<sup>13</sup> have demonstrated the use of magnification to improve clinical ability to visualize and access canals.

Pulp chamber that appears to be deviated from normal configuration , either triangular or too large in mesio distal plane should be suspected of having three canals (Bellizi and Hartwell- 1981).

In spite of being difficult to negotiate due to narrowing and curvature , most of the canals can be negotiated and instrumented using current endodontic technique. Failure to recognize the presence of extra root or canals can often lead to acute flare-ups during treatments and subsequent failure.

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