



Research Paper

Management of Mandibular left second premolar with two roots: A Case Report

Dr. M.B. Wavdhane¹, Dr. Pradnya V. Bansode², Dr. Seema D. Pathak³,
Dr. Rinky Hajong⁴

1. Associate professor, Department of conservative dentistry and endodontics, GDC & Hospital, Aurangabad/
MUHS, India

2. Head of the department, Professor, Department of conservative dentistry and endodontics, GDC & Hospital,
Aurangabad/ MUHS, India

3. Professor, Department of conservative dentistry and endodontics, GDC & Hospital, Aurangabad/ MUHS,
India

4. MDS Student, Department of conservative dentistry and endodontics, GDC & Hospital, Aurangabad/ MUHS,
India

*Corresponding Author: Dr. Rinky Hajong

ABSTRACT

Mandibular second premolars (MSPs) have varied anatomy ranging from 1 to 3 roots and 1–5 canals. Successful endodontic treatment is achieved by proper access opening, cleaning, and shaping and three-dimensional obturation. Though most frequent type of tooth configuration reported is the presence of one root and root canal. This case report enlightens the prime aspects of diagnosis and endodontic management of an aberrant configuration with respect to mandibular second premolar. A variation in number of roots as well as canal morphology is not scarce. This article reports a clinical case of mandibular second premolar with two roots and root canals treated successfully with endodontic therapy.

KEYWORDS: Mandibular second premolar, Aberrant morphology, Endodontic management.

Received 16 November, 2020; Accepted 20 December, 2020 © The author(s) 2020.

Published with open access at www.questjournals.org

I. INTRODUCTION

Thorough knowledge of internal anatomy of root canal system makes endodontic treatment successful.^{1,2} Understanding the presence of aberrant internal root canal morphology contributes toward success and increases overall prognosis of endodontically treated teeth. There are numerous documented studies, case reports³, and literature review⁴, describing aberrant canal systems in mandibular second premolars (MSPs). Studies have also shown that the canal system varies according to gender, race, ethnicity and syndromes.⁵

The aberrant canal anatomy has been observed in each tooth as in number of roots, canals, isthumi, and apical foramen. Mandibular first premolar has varied variation in root canal system, so it is known as enigma to endodontists. However, various studies and case reports stated varied anatomy with MSP, so this tooth can also be considered as enigma to endodontist. MSP usually have two pulp horns, the buccal located at a higher level than the lingual. Usually, MSP has single root and single canal (97.5%),⁶ however, incidence of two (2.5%),⁶ three (0.4%),⁷ and four roots were also found. Accessory apical foramen was seen in 47% of MSPs.⁷ Recently, Singh and Pawar observed that MSPs showed single root in 92% and >2 roots in 8%, 58% had one apical foramen, and 12% showed two apical foramen in South Asian population.⁸ This article reports on the clinical case of a mandibular second premolar with two roots.

II. CASE REPORT

A 30 year old male patient reported to the department with the chief complaint of pain in the lower left teeth region for the past 14 days. Patient's medical history was non-contributory. Patient gave a dental history of FPD for tooth no. 35, 36, 37 since 4 years. Clinical examination revealed FPD in respect to tooth no. 35, 36, 37 since 4 years without endodontic treatment w.r.t 35, 37. The teeth w.r.t 35, 37 were tender on percussion. Radiographic assessment of the tooth 35 indicated an aberrant anatomy of two roots, and also there was

widening of the apical periodontium w.r.t 35,37, indicating periapical pathology and the necessity for root canal treatment [Figure 1]. The clinical examination, radiographic examination and vitality tests led to a diagnosis of acute apical periodontitis requiring endodontic therapy.

The treatment suggested was removal of prosthesis followed by endodontic therapy. The FPD prosthesis was removed. The teeth were anaesthetized by way of left inferior alveolar nerve block using a 2% solution of lignocaine hydrochloride containing 1:80000 adrenaline (Lignox 2% A, Warren, Indoco). Endodontic access cavity was prepared using endo access bur. A sharp DG16 explorer was utilized to locate the canal orifices, and the access was modified accordingly. Pulp extirpation was done and canal patency was maintained, size 10 k(Dentsply-Maillefer) files were inserted and working length determined using radiograph and affirmed utilizing Root ZX apex locator (Fig. 2). Cleaning and shaping of the canals were performed using step back technique under copious irrigation with 5.25% sodium hypochlorite solution and 17% EDTA (Ethylenediaminetetraacetic acid). The canals were dried with paper points, close dressing was given after completion of chemo-mechanical preparation and patient was re-appointed after three days for obturation. In follow-up appointment, as the tooth was completely asymptomatic, master cones radiograph was taken. The canals were obturated with cold, lateral compaction of gutta percha cones (Dentsply) using sealapex sealer (Kerr, SybronEndo). Radiograph after obturation is taken. Post-obturation restoration was done and post-operative radiograph was taken (Fig. 3).

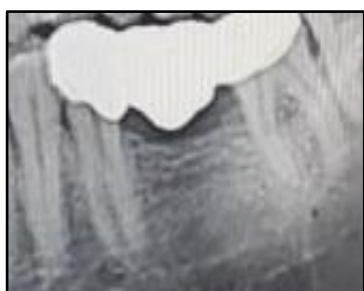


Fig. 1: Pre-operative diagnostic radiograph



Fig. 2: Working length determination radiograph



Fig. 3: Radiograph with post-obturation restoration w.r.t 35, 37

III. DISCUSSION

Anatomical variations, especially extra canals and roots, should always be kept in mind when treating teeth endodontically. Canals if left unclean may harbour microorganisms, which have been reported to be a major cause for treatment failure.^{9,10} The presence of extra roots or canals in mandibular premolars is undoubtedly an endodontic challenge. In a study at the University of Washington it was found that the mandibular premolars showed the highest failure rate of all types of teeth.¹¹

Previous studies on anatomy of tooth that included 4019 teeth report on data for the number of roots in the mandibular second premolar (Table 1). Conceivably, these findings could be due to the complex root canal anatomy of a large number of these teeth. A wide range of opinions are reported in the literature regarding the number of root canals, but there are very few reports on the variations in the number of roots that occur in the mandibular second premolars.^{12,13}

These discussions also validate an important consideration that must not be overlooked i.e. the anatomic position of the mental foramen and the neurovascular structures that pass through it, in close proximity to the apices of the mandibular second premolar. There are reports in the literature, of flare-ups in mandibular second premolars with associated parasthesia of the inferior alveolar and mental nerves.¹⁴ Failure to recognize

the presence of extra root or canals can often lead to acute flare-ups during treatment. Successful endodontic outcome in such cases is dependent upon careful use of all the available diagnostic aids to locate and treat the entire root canal system. Careful interpretation of angled radiographs, proper access preparation and a detailed exploration of the tooth are essential prerequisites for a successful treatment outcome.

Table 1: Incidence (%) of number of roots in the mandibular second premolar

Anatomic Studies	1 Root (%)	2 Roots (%)	3 Roots (%)
Barrett (1925)	100	-	-
Zilich and Dowson (1973)	96.6	-	0.4
Vertucci (1978)	100	-	-
Geider et al (1989)	97.6	0.4	-
Zaatar et al (1997)	95.6	4.7	-
Sert and Bayirli (2004)	100	-	-

IV. CONCLUSION

The clinician should be astute enough to identify the presence of unusual numbers of roots and their morphology. A thorough knowledge of root canal anatomy and its variations, careful interpretation of the radiograph, close clinical inspection of the floor of the chamber and proper modification of access opening are essential for a successful treatment outcome.

REFERENCES

- [1]. Krasner P, Rankow HJ. Anatomy of the pulp-chamber floor. J Endod 2004;30:5-16.
- [2]. Rödiger T, Hülsmann M. Diagnosis and root canal treatment of a mandibular second premolar with three root canals. Int Endod J 2003;36:912-9.
- [3]. Amos ER. Incidence of bifurcated root canals in mandibular bicuspid. J Am Dent Assoc 1955;50:70-1.
- [4]. Cleghorn BM, Christie WH, Dong CC. The root and root canal morphology of the human mandibular second premolar: A literature review. J Endod 2007;33:1031-7.
- [5]. Llana C, Fernandez J, Ortolani PS, Forner L. Cone-beam computed tomography analysis of root and canal morphology of mandibular premolars in a Spanish population. Imaging Sci Dent 2014;44:221-7.
- [6]. Vertucci FJ. Root canal morphology of mandibular premolars. J Am Dent Assoc 1978;97:47-50.
- [7]. Zillich R, Dowson J. Root canal morphology of mandibular first and second premolars. Oral Surg Oral Med Oral Pathol 1973;36:738-44.
- [8]. Singh S, Pawar M. Root canal morphology of South Asian Indian mandibular premolar teeth. J Endod 2014;40:1338-41.
- [9]. Molander A, Reit C, Dahlen G, Kvist T. Microbiological status of root filled teeth with apical periodontitis. Int Endod J 1998;31:1-7.
- [10]. Sundqvist G, Fidgor D, Persson S, Sjogren U. Microbiologic analysis of teeth with failed endodontic treatment and the outcome of conservative retreatment. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1998;85:86-93.
- [11]. Goswami M, Chandra S, Chandra S, Singh S. Mandibular premolar with two roots. J Endod 1997;23:187.
- [12]. Ingle JI, Simon JH, Machatou P, Bogaerts P. Outcome of endodontic treatment and re-treatment - "Textbook of Endodontics". Ingle JI, Bakland LK, editors. 5th ed. BC Decker Inc: 2002. p. 747-57.
- [13]. Shapira Y, Delivannis P. Multiple rooted mandibular second premolars. J Endod 1982;8:231-2.
- [14]. Glassman GD. Flare up associated with parasthesia of a mandibular second premolar with three root canals. Oral Surg Oral Med Oral Pathol 1987;64:110-3.

Dr. Rinky Hajong, et. al. "Management of Mandibular left second premolar with two roots: A Case Report." *Quest Journals of Medical and Dental Science Research* 7.6 (2020): 41-43.