

A Case Report- Maxillary Second Molar with 3 Buccal Canals

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ABSTRACT

The first step in successful endodontic treatment is to gain access to the pulp chamber and negotiate all the canals. To achieve this goal, practitioners need to be familiar with all possible variations in the root canal system and have adequate information of the tooth needing treatment. The present case report describes an anatomic variant of maxillary second molar with 4 canals that is one mesiobuccal, 2 distobuccal and one palatal canal.

INTRODUCTION

Bjorndal (personal communication, April 1975) has stated that knowledge of root canal anatomy is the "single most important aspect for the successful treatment of endodontically treated teeth." Finding all of the root canals in an endodontic case is essential to long-term treatment success. In other words, the clinician cannot properly clean and shape, fill, and seal root canals that he does not find. Additionally, the clinician cannot find anomalous root canals if he does not know where to look for them or that he should look for them.¹

The morphologic and anatomic variations of the root canals in the maxillary first molar have been extensively described, but reports of variations of the maxillary second molar are relatively rare.² A maxillary second molar typically has three or four canals with 1 canal in each of the palatal and the distobuccal roots and 1 or 2 in the mesiobuccal root, as usually found in a maxillary first molar. Never-the less, there have been a few reports of variations of the maxillary second molars root canals. In a study of 520 root canal treated maxillary second molar, there was a 22.7% incidence of 3 separated roots, with 1 canal in palatal root, 1 canal in distobuccal root and 2 canals in mesiobuccal roots. Further, 1.4% had four separated roots with one canal in each the mesio and distobuccal root and the unusual occurrence of 2 separated palatal roots². In addition, in a study of 1,200 maxillary second molars, 5 were found to have 4 roots, and there is a case report of a maxillary second molar with 3 buccal roots (1 mesiobuccal and 2 disto. buccal roots).⁴ A low incidence of second distobuccal (DB2) canal in maxillary molars has been reported in the literature. In a review of the literature, Cleghorn et al found 14 studies that reported on the DB root. The total number of teeth in these studies were 2576, and the incidence of 2 or more canals was 1.7%.⁵

CASE REPORT

A 28-year male patient reported to the department of conservative dentistry and endodontics with a chief complaint of blackish discoloration, pain and sensitivity to hot and cold stimuli in upper right back tooth region for 2 weeks. The patient had no past or present medical history significant to this case. The subjective symptoms reported by the patient were pain on mastication and prolonged sensitivity to eating and drinking both hot and cold food. The patient also reported periodic episodes of spontaneous pain from this tooth. The objective symptoms observed were: prolonged sensitivity to hot and cold, percussional sensitivity, and discomfort to palpation over the root apex. Provisional diagnosis of irreversible pulpitis with apical periodontitis was made in 17 due to caries. Radiographic evaluation revealed that radiolucency was reaching towards the pulp, alveolar bone was within normal limits and no periodontal space widening was seen (Fig-1). So, Final diagnosis of irreversible pulpitis with apical periodontitis in 17 due to caries was made.

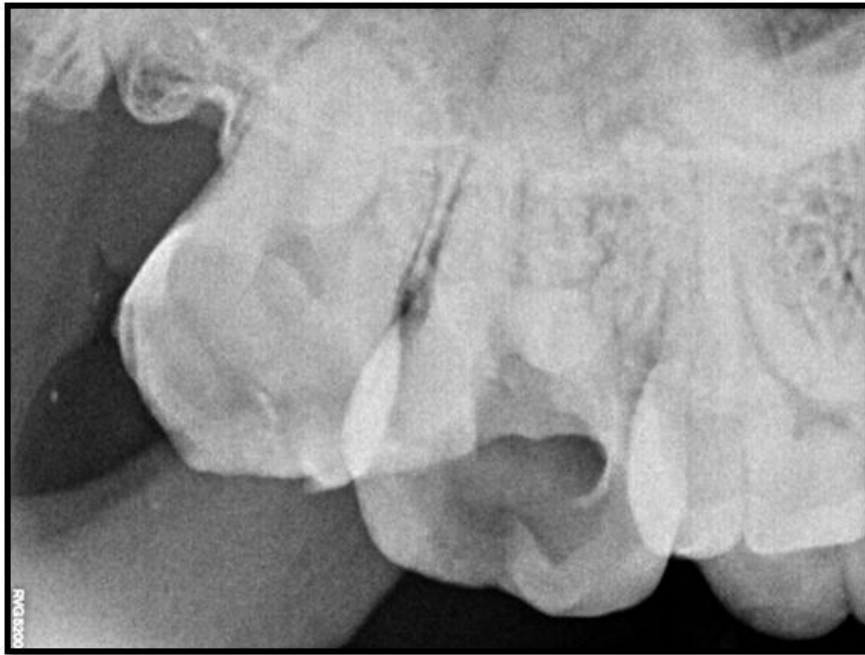


Figure- 1 (Preoperative radiograph of right maxillary second molar.)

The tooth was anesthetized, isolated with a rubber dam and clamp, and an access opening was done. The palatal and mesiobuccal canals were immediately located through the conventional access opening.

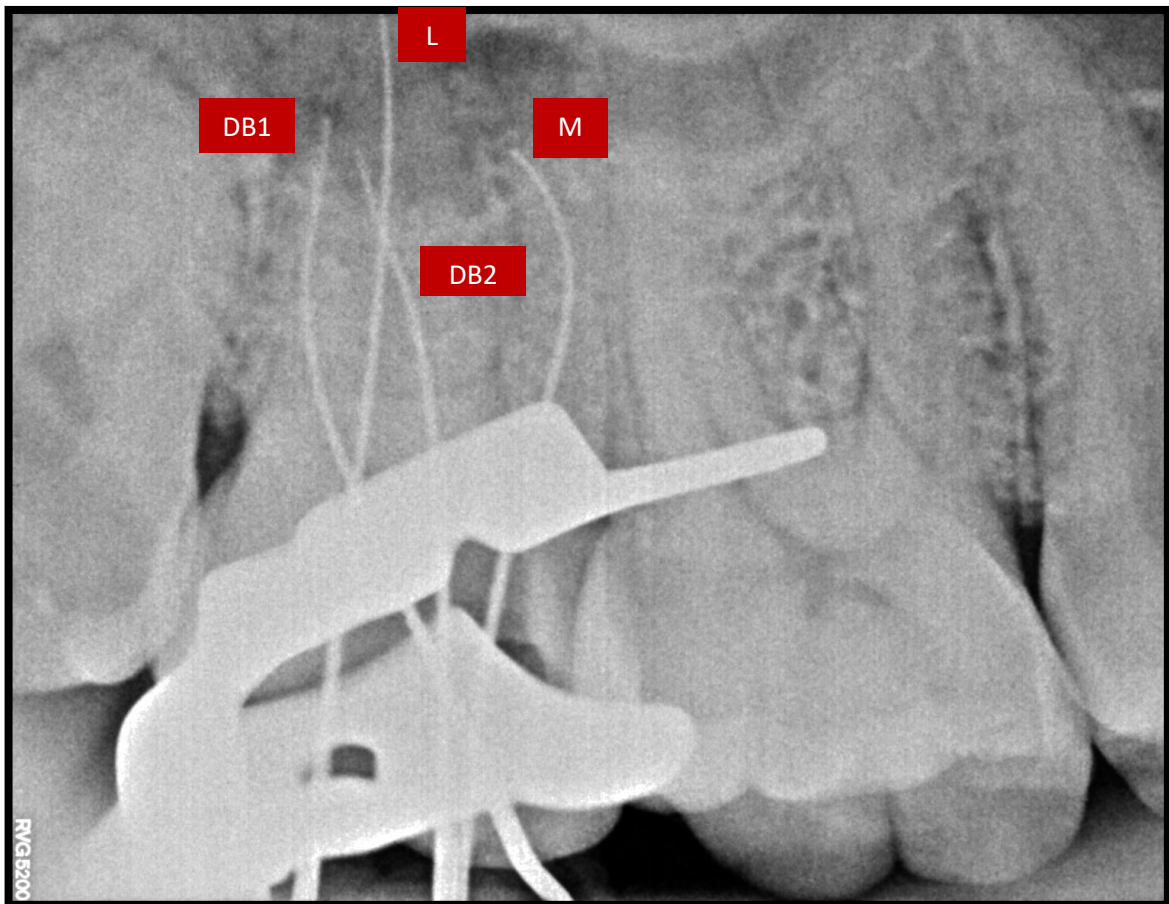


Figure-2 (Radiograph of files in the mesiobuccal, two distobuccal, and palatal root canals which were found.)

First distobuccal canal was located by extending the access opening further than usual to the distal. A second distobuccal canal was located on closer inspection of the floor of the pulp chamber. The distobuccal canals were located

more to the buccal than the mesiobuccal canal(Fig-2).This was not the normal location of the distobuccal canal. The distobuccal canal is usually found more towards the center of the pulp chamber floor (Fig-3).

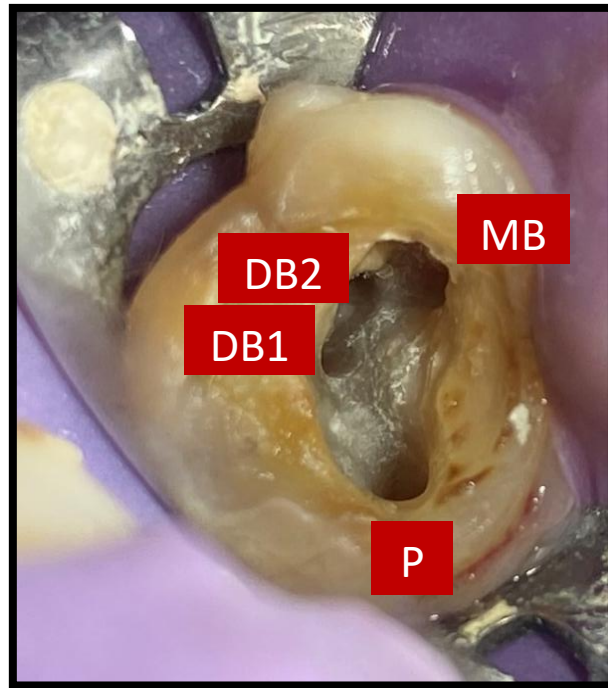


Figure-3 (Floor of pulp chamber and position of canal orifices)

The first impression was that a perforation had been encountered on the distal. Even initial radiographic evidence did not make it entirely clear that a perforation had not been created on accomplishing the access opening. There was minimal bleeding which ceased after the four canals were instrumented beyond two sizes of the initial working length file. Perforations, generally, continue to bleed after instrumentation is completed. The final radiograph of this maxillary second molar was most revealing after completion of instrumentation and filling the root canals with gutta-percha and sealer (Fig-4) followed by composite restoration (Fig- 5).

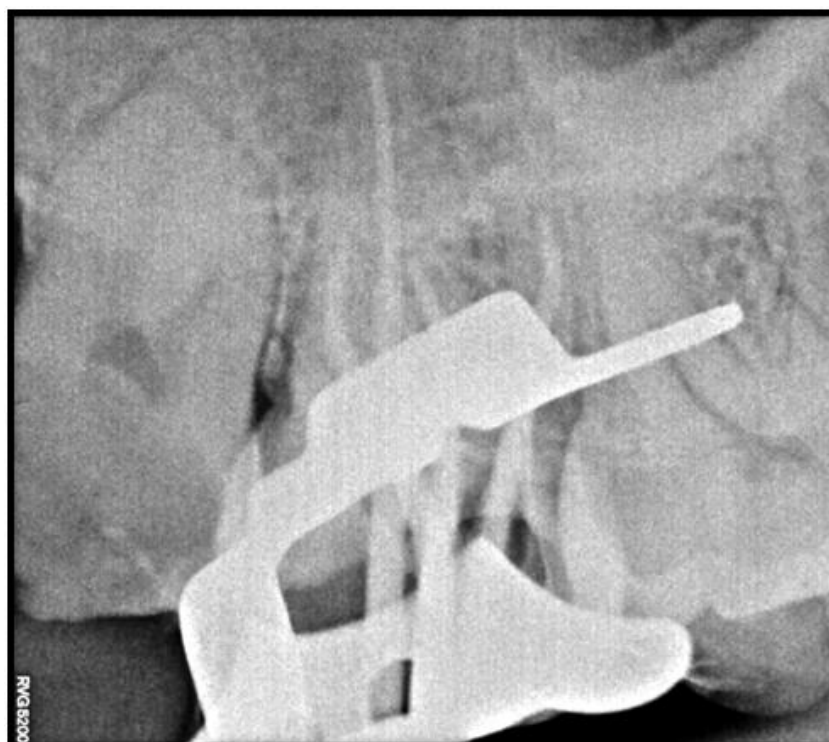


Figure-4 (Master Cone X-Ray)

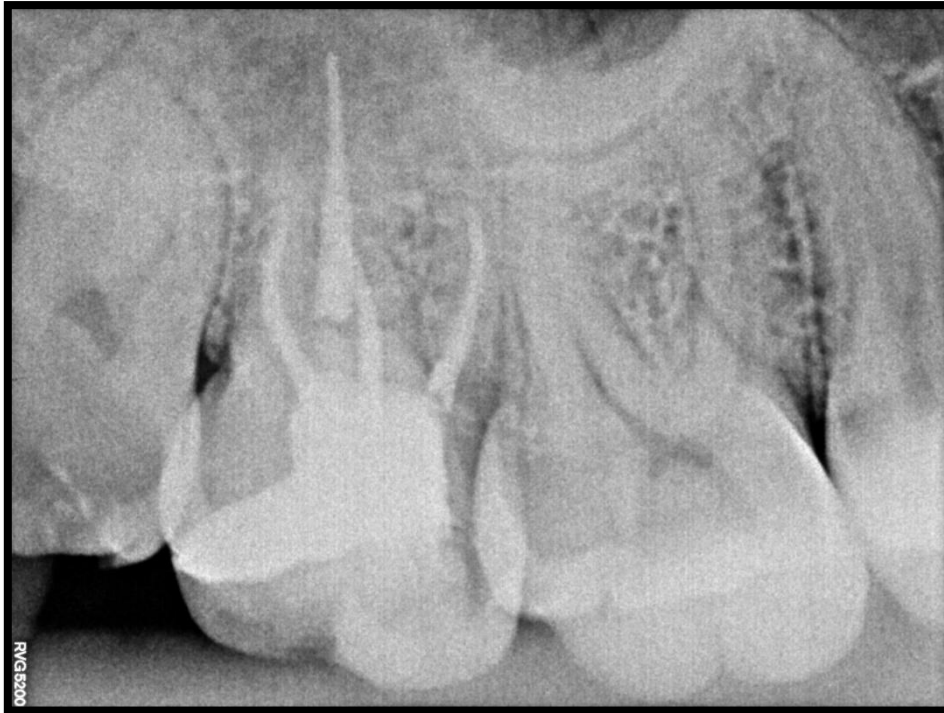


Figure-5 (Post Operative picture)

DISCUSSION

The key to successful endodontic therapy, as stated before, is dependent upon locating all of the root canals and then cleaning, shaping, and sealing them. Access openings as found in textbooks are only useful as a guideline. Modifications of the access openings may be necessary to locate variations of the "normal" anatomy.¹

The use of microscopes during endodontic treatment in dental clinics has become more widespread and this practice has made the detection of hidden accessory canals easier, especially for mesiolingual canals of the maxillary molars. According to Buhley et al. magnification with microscopes and Dental loupes permits approximately a threefold higher detection rate of mesiolingual canals than is obtained with the naked eye.²

Pineda and Kuttler⁶ reported that 3.6% of maxillary molars have two distobuccal canals. Gray⁷ has reported that 2.4% of maxillary first molars have five canals (two mesiobuccal canals, two distobuccal canals, and one lingual canal). Martinez-Berna' and Ruiz-Badanelli⁸ reported 0.88% (3 of a sample of 338 maxillary molars) with two Vol. 14, No. 4, April 1988 distobuccal canals. These latter investigators found only one of the three teeth with two separate foramina.

This case report demonstrated that the "extra" distobuccal canal was located approximately 1 mm directly mesial of the main distobuccal canal. The crown was visibly normal in mesiodistal and buccolingual dimensions.

Case reports of this nature in the dental literature serve four important purposes:

1. To appreciate the complexity and variability of "routine" endodontic therapy.
2. To know that aberrations may occur in a particular tooth under treatment and, more importantly, to know where to look for possible aberrant canals.
3. To ensure more predictable success of endodontically treated teeth.
4. To avoid unnecessary periapical surgery by retreatment of failing endodontic therapy.

CONCLUSION

The case of a maxillary right second molar is discussed. This molar presented with a rare second distobuccal canal which terminated in a separate root and, thus, a separate apical foramen. The importance of reporting these unusual cases is discussed.

REFERENCES

- [1]. Fahid A, Taintor JF. Maxillary second molar with three buccal roots. Journal of Endodontics. 1988 Jan 1;14(4):181-3.

- [2]. Kim JR, Choi SB, Park SH. A maxillary second molar with 6 canals: a case report. *Quintessence international*. 2008 Jan 1;39(1).
- [3]. Peikoff MD, Christie WH, Fogel HM. The maxillary second molar: variations in the number of roots and canals. *International Endodontic Journal*. 1996 Nov;29(6):365-9.
- [4]. Libfeld H, Rotstein I. Incidence of four-rooted maxillary second molars: literature review and radiographic survey of 1,200 teeth. *Journal of Endodontics*. 1989 Mar 1;15(3):129-31.
- [5]. Briseño-Marroquín B, Paqué F, Maier K, Willershausen B, Wolf TG. Root canal morphology and configuration of 179 maxillary first molars by means of micro-computed tomography: an ex vivo study. *Journal of Endodontics*. 2015 Dec 1;41(12):2008-13.
- [6]. Pineda F, Kuttler Y. Mesiodistal and buccolingual roentgenographic investigation of 7,275 root canals. *Oral Surgery, Oral Medicine, Oral Pathology*. 1972 Jan 1;33(1):101-10.
- [7]. Bjorndal AM, Skidmore E (eds.). *Anatomy and morphology of the human teeth*. Iowa City: University of Iowa Press, 1983:31-40.
- [8]. Martínez-Berná A, Ruiz-Badanelli P. Maxillary first molars with six canals. *Journal of endodontics*. 1983 Sep 1;9(9):375-81.