

Endodontic Management of a Three Rooted Maxillary Premolar: A Report of 3 Cases

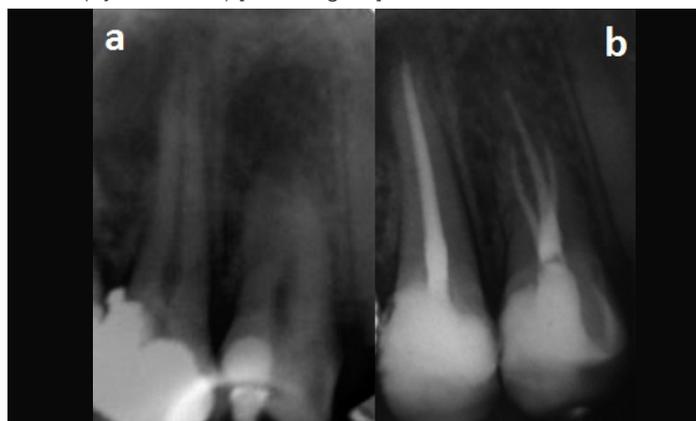
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Keywords: Anatomical variations, Root anatomy, Root canal treatment

CASE 1

A 26-year-old male patient reported to the Department of Endodontics, with a chief complaint of pain in the upper right quadrant, plus unfinished restoration in the first premolar. The clinical and radiographic findings and vitality tests led to a diagnosis of asymptomatic irreversible pulpitis of the right maxillary first premolar, necessitating endodontic therapy [Table/Fig-1a].

The right maxillary first premolar was anaesthetized and isolated with rubber dam and the endodontic access was prepared. In the floor of the first premolar, only two orifices were detected. The access was modified in a cavity with a T-shaped outline and the three canals were detected. The mesiobuccal, distobuccal and the palatal canals were explored with a size 15 Flexofile (Dentsply). The working length was established with an apex locator and cleaning and shaping were performed using ProTaper Next rotary instruments (Dentsply) under abundant irrigation with 5.25% sodium hypochlorite. Final irrigation was done with 17% EDTA plus three periods of 20 seconds passive ultrasonic irrigation with sodium hypochlorite. The root canals were dried with paper points and obturated with laterally condensed gutta-percha and Sealapex sealer. (Sybron Endo) [Table/Fig-1b].



[Table/Fig-1a]: Preoperative radiograph showing the presence of three separate roots in right maxillary first premolar.

[Table/Fig-1b]: Post-operative radiograph with all three canals obturated.

CASE 2

A 69-year-old American male was referred by his general dentist for an endodontic re-treatment of the maxillary left first premolar. Clinically, a sinus tract was found apically on the distobuccal aspect of the tooth 24. Periapical radiography revealed the possible presence of an untreated distobuccal root [Table/Fig-2a] leading to sinus tract formation. The left maxillary first premolar was anesthetized and isolated with rubber dam and access was made through the porcelain crown and modified with a T-shape outline. The distobuccal canal was explored with a size 15 Flexofile (Dentsply) and the mesiobuccal and palatal canals were retreated using Protaper Retreatment system (Dentsply) and after assessing

the glide path, Protaper Next (Dentsply) files were used to shape and finish the canals under abundant irrigation of sodium hypochlorite. Calcium hydroxide was used as an intracanal medicament and after one week, obturated with cold laterally condensed gutta-percha and Tubliseal sealer [Table/Fig-2b].

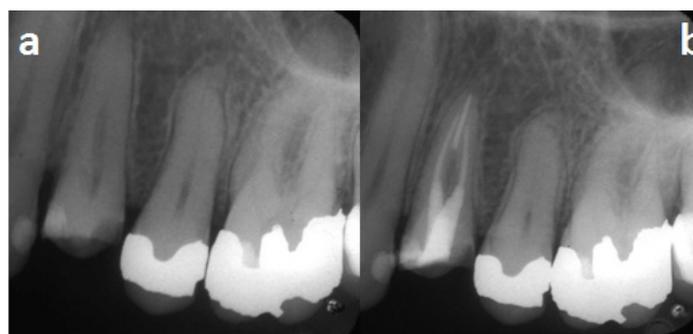
CASE 3

A 30-year-old Mexican male with non-contributory medical history sought treatment, and his chief complaint was pain in the upper left back teeth region. A diagnosis of symptomatic irreversible pulpitis was made and endodontic treatment was planned in 24. Lingual and buccal canals were scouted using a 15 Flex R file. The buccal end of the access was extended mesio-distally using an Endo Z bur. A distobuccal orifice was located and working lengths were confirmed with apex locator. The canals were cleaned and shaped with Light Speed LSX Endo files and sodium hypochlorite. Canals were obturated with standardized gutta-percha points by lateral condensation technique [Table/Fig-3a,3b].



[Table/Fig-2a]: Preoperative radiograph showing the presence of an untreated distobuccal root in left maxillary first premolar.

[Table/Fig-2b]: Post-operative radiograph with all three canals obturated. The sinus tract disappears after the first appointment.



[Table/Fig-3a]: Preoperative radiograph left maxillary first premolar. Most often it is not possible to observe the presence of vestibular roots separated.

[Table/Fig-3b]: Post-operative radiograph with all three canals obturated. The palatal root was prepared for the placement of a post.

DISCUSSION

The most recent studies demonstrate that a root with a graceful, tapering canal and a single apical foramen is the exception rather than the rule [1]. The practitioner should be aware of how many canals to expect, their location, length and relationship to each other [2]. This anatomic abnormality is an additional challenge, which begins at case assessment and involves all operative stages [3]. Additional canals may be detected by clinical investigation of the floor of the pulp chamber. Three-rooted maxillary first premolars are uncommon (0.5-1%) and are similar to that of adjacent maxillary molars [4]. Untreated canal, deficient debridement and incomplete obturation of the root canal system are the most common reasons for failure of endodontic treatment. The clinician must have an understanding of normal anatomy, and of common variations from the norm. A maxillary three rooted first or second premolar should be suspected when the pulp chamber appears to deviate from normal configuration and seems to be triangular or large in

a mesiodistal plane [5]. Maxillary first premolars are one of the most difficult teeth to be treated endodontically, which is due to number of roots and canals, the direction and frequent longitudinal depressions of the roots and the difficulties to visualize the apical limit and the root curvatures toward the buccal and lingual by radiographs.

REFERENCES

- [1] Gopal S, John G, Kumar P, Latha S, Latha S, Kallepalli S. Endodontic treatment of bilateral maxillary first premolars with three roots using CBCT: a case report. *Case Rep Dent* 2014;1:1-4.
- [2] Gandhi B, Majety KK, Gowdra RH. Root canal treatment of bilateral three-rooted maxillary first premolars. *J Orofac Sci*. 2012; 4:56-59.
- [3] Javidi M, Zarei M, Vatanpour M. Endodontic treatment of a radicular maxillary premolar: a case report. *J Oral Sci*. 2008;1:99-102.
- [4] Praveen R, Thakur S, Kirthiga M, Shankar S, Nair VS, Manghani P. The radicular' premolars: case reports of a maxillary and mandibular premolar with three canals. *J Nat Sc Biol Med*. 2015;6:442-45.
- [5] Naveen Kumar V, Madharam K, Dhanavel C, Rajvikram N. Three rooted maxillary first premolar: report of 2 cases. *IJCD*. 2011; 2:109-11.

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Date of Submission: **Nov 18, 2015**

Date of Peer Review: **Jan 07, 2016**

Date of Acceptance: **Jan 12, 2016**

Date of Publishing: **Jun 01, 2016**

FINANCIAL OR OTHER COMPETING INTERESTS: None.