# TWO ROOTED MAXILLARY SECOND MOLAR WITH FOUR CANALS: A RARE ENTITY

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## Introduction

Anatomical variations are inevitable in every tooth with maxillary second molar being no exception.[1] Variations in root anatomy includes presence of single root, two roots, fused roots, extra palatal root[2,3]. Variations in internal anatomy include second mesiobuccal canal, three canals in mesiobuccal root, second distobuccal canal, two canals in palatal root, C shaped palatal canal.[3] Application of CBCT in endodontics serves the purpose of aiding in diagnosis and also improves the treatment planning, thereby enhancing the treatment outcomes. This clinical case report presents a successful endodontic treatment of a maxillary second molar with a rare and unusual root canal anatomy using CBCT as a diagnostic aid.

## Case report

A 34 years old female patient reported to department of conservative dentistry and endodontics with pain in upper left back tooth since a week. Based on clinical, radiographic and pulp testing examination, a diagnosis of symptomatic apical periodontitis of left maxillary second molar was made and non surgical endodontic treatment was planned. During the endodontic treatment the tooth was anaesthetized. Conventional endodontic access cavity was made under rubber dam isolation. Thorough inspection of the pulp chamber floor with a DG16 endodontic explorer revealed four distinct root canal orifices, two on mesial side and two on distal side (Fig 1a). The two distal canals were seen to be in close proximity. The number and location of canal orifices seemed to be unusual. Moreover, the intraoral periapical radiograph did not reveal the number and morphology of the roots clearly (Fig 2a). Therefore, CBCT imaging was performed. The axial CBCT

images revealed that the left maxillary second molar had two roots which were located mesially and distally and four root canals namely mesiobuccal (MB) canal, mesiopalatal(MP) canal in mesial root, distobuccal (DB) and distopalatal (DP) canal in distal root (Fig 1b).

After exploring the four root canals with #10 K files the working lengths were determined (Fig 2b). Cleaning and shaping were performed using Protaper Gold™ rotary instruments using a crown down technique. All the 4 four canals were enlarged to size F2 (Fig 2b). Irrigation was performed using 2.5% Sodium hypochlorite solution and 17% Ethylene Diamine Tetra Acidic acid during cleaning and shaping; 2% Chlorhexidine was used as final rinse. Later, the root canals were dried with absorbent points and Calcium hydroxide intra canal medicament was placed and the access cavity was sealed with Cavit. The next appointment was scheduled after one week, where the patient was found to be asymptomatic. Obturation was done by using cold lateral compaction of Guttapercha and AH plus resin sealer. A radiograph was taken to assess the quality of the obturation (Fig 2c). After completion of root canal treatment, the tooth was restored with a composite resin core followed by appropriate coronal restoration.

## Discussion

Typically, a maxillary second molar has three roots and each of these roots have a single canal. Presence of two roots in maxillary second molar is a rare occurrence. Zhang et al[4], Nikoloudaki GE et al[5], Peikoff et al[1], Libfield et al[2] have reported the frequency of occurrence of two rooted maxillary molar as 8%, 8.25%, 6.9% and 12% respectively. Usually, when a two rooted maxillary second molar is present, they have a single canal in each root. The two roots can either be mesial and distal or buccal and lingual roots as reported by Zhang et al in his radiographic study using CBCT[4]. Presence of four canals in a two rooted second maxillary molar is a rare entity.

Unlike some cases which reported presence of extra palatal root in maxillary second molars, our case reveals the absence of a palatal root. In addition, in our report, the two roots of maxillary second molar are positioned mesially and distally and each with two root canals, thus making it rare and unusual. Till date, only three case reports have been reported, where a maxillary second molar had two separate

mesial and distal roots with two canals in each root.[6,7,8] In the present case, both the canals in each root were of Weine's type II root canal configuration, similar to the one reported by Ashraf et al[6]. Sathyanarayanan et al has reported almost similar case wherein the distal root showed Vertucci type VI canal configuration[7].

The accuracy of CBCT in determining the root canal systems has been known to be more precise in comparison with the conventional radiographs. In the present case report usage of CBCT enabled us to study the root canal morphology more explicitly, eventually leading to successful endodontic treatment.

## References


1. Peikoff MD, Christie WH, Fogel HM.The maxillary second molar: variations in the number of roots and canals. Int Endod J.1996;29(6):365-9.
2. Libfeld H, Rotstein I. Incidence of Four-rooted Maxillary Second Molars: Literature Review and Radiographic Survey of 1,200 teeth. J Endod. 1989 Mar;15(3):129-31.
3. Ghasemi N, Rahimi S, Shahi S, Samiei M, Frough Reyhani M, Ranjkesh B. A Review on Root Anatomy and Canal Configuration of the Maxillary Second Molars. Iran Endod J. 2017 Winter;12(1): 1–9.
4. Zhang R, Yang H, Yu X, Wang H, Hu T, Dummer PM. Use of CBCT to identify the morphology of maxillary permanent molar teeth in a Chinese subpopulation. Int Endod J. 2011;44(2):162-9
5. Nikoloudaki GE, Kontogiannis TG, Kerezoudis NP. Evaluation of the Root and Canal Morphology of Maxillary Permanent Molars and the incidence of the second mesiobuccal root canal in Greek population using Cone-beam Computed Tomography. Open Dent J. 2015 Jul 31;9:267-72.
6. Ashraf H, Dianat O, Hajrezai R, Paymanpour P, Azadnia S. Endodontic Treatment of a Double-Rooted Maxillary Second Molar with Four Canals: A Case Report.Iran Endod J. 2014 Fall; 9(4): 304–306.
7. Sathyanarayanan K, Poornima L. Endodontic Management of Maxillary Second Molar with Vertucci Type VI Root Canal Morphology Diagnosed Using Cone-beam Computed Tomography. Contemp Clin Dent. 2018;9(3):494-497.
8. Sımsek N, Keles A, Bulut ET. Unusual root canal morphology of the maxillary second molar: a case report. Case Rep Dent. 2013;2013 :138239.

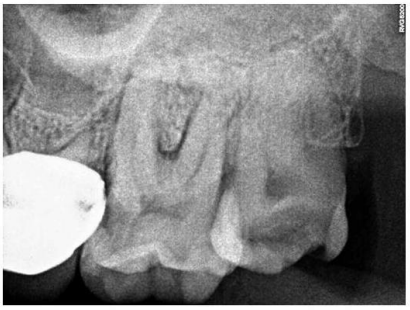

Fig 2a: Pre operative radiograph

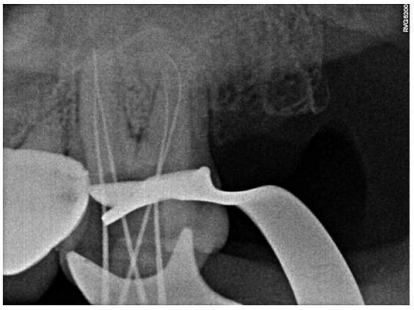

Fig 2b: Working length

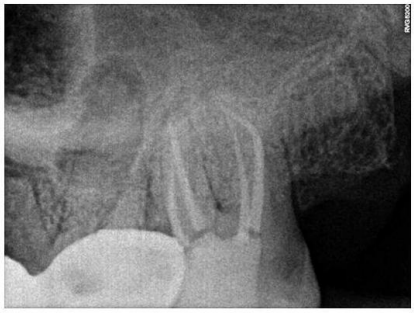

Fig 2c: Obturation

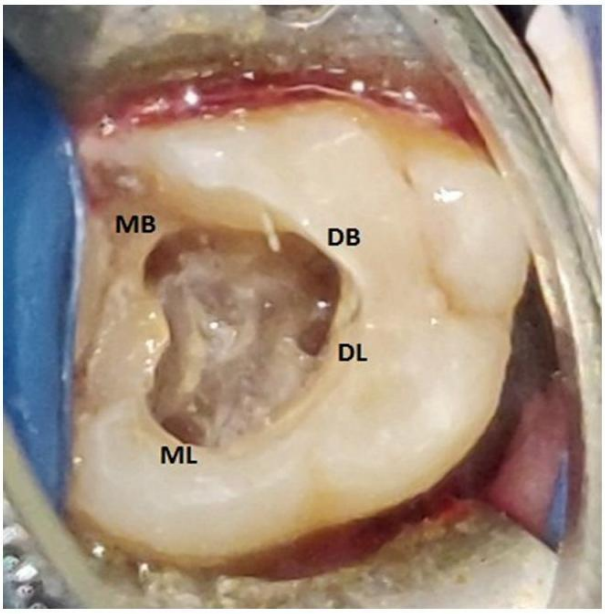


Fig 1a: Pulp chamber view

Fig 1b: CBCT image