



## PERMANENT MANDIBULAR CANINE WITH TWO ROOTS AND TWO ROOT CANALS: CASE REPORT

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### Abstract:

Permanent mandibular canines show the least diversities among anatomical variations in roots and root canals, however in endodontics anatomic variability is the rule rather than the exception. Therefore, the knowledge and identification of these variabilities is paramount for successful endodontic treatment. This article presents a case of endodontic treatment of permanent mandibular canine with two roots and two root canals.

**Key Words:** tooth root, canine teeth, endodontics, root canal preparation, dental digital radiography

### Introduction:

Mandibular canine has monoradicular morphological presentation, but internal anatomy may differ from the external morphological presentation. Mandibular canine may exhibit one, two or more canals.[1] Accessory canals can be identified with 2D radiographs taken in more than one angulation or with use of 3D radiographs such as CBCT, use of high magnification helps in better visualization. [2]. Any catch on exploration of pulp chamber with probe can be considered as indication of presence of an extra canal.[3]

The aim of endodontic treatment is to eliminate bacteria. However, if the dentist is unaware of the unusual anatomy of tooth, it may lead to ineffective cleaning and shaping of the root or canals resulting in pain and infection due to presence of persistent microorganisms. Therefore, failure to acknowledge the variation in anatomy can cause endodontic failure.[4] The present report presents a case of endodontic treatment of permanent mandibular canine with two roots and two canals thus highlighting the occurrence of this morphological variation in mandibular canine.

### Case Report

A 28-year-old female presented to a private clinic, complaining of severe pain on lower right side. She gave a history of spontaneous, radiating pain that kept her awake through the night. Pain was only relieved on taking analgesics. Her medical history was unremarkable.

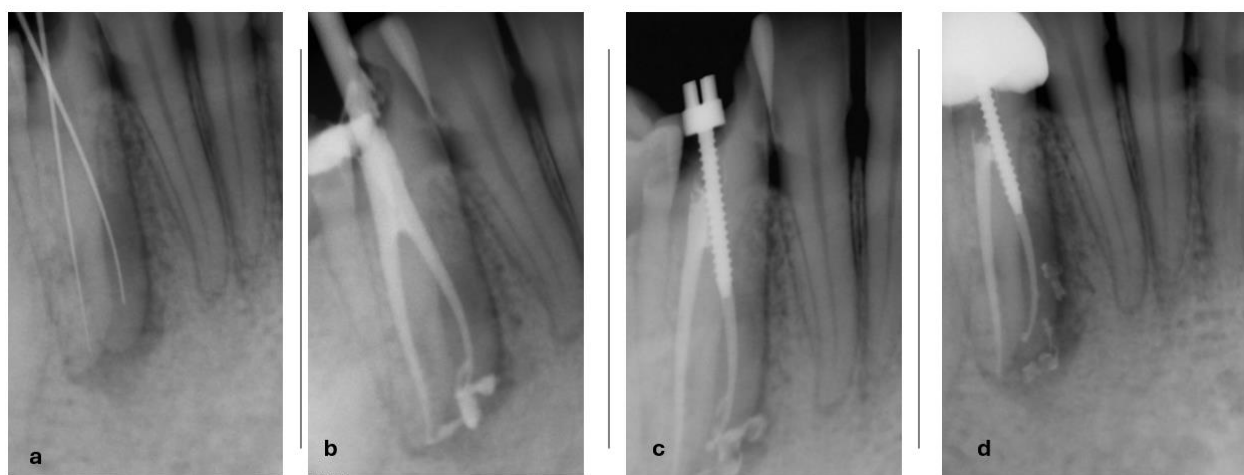
On clinical examination, she had a carious 43. Sensibility testing was done on mandibular anterior teeth and 43 gave a lingering response on cold testing. On mechanical testing, it was tender to

percussion and mobility was within normal limits. Intraoral digital periapical radiograph was taken on different angles that revealed periapical radiolucency and two roots of canine. Based on clinical and digital periapical radiographic examination, a diagnosis of symptomatic irreversible pulpitis with acute periapical periodontitis was established. Root canal treatment with post and core buildup followed by full coverage porcelain fused to metal crown was planned.

After infiltration of local anesthesia using 1.8 ml Medicaine (2% lidocaine with 1:100000 epinephrine), access opening was done using round bur #33 and with endo-Z tapered safe end bur under rubber dam isolation. High magnification using 3.5 X (Univet, italian) endodontic loupes was used for endodontic treatment. Two distinct canal orifices were visible, situated on the buccal and lingual side. Orifices were initially negotiated with DG-16 probe. A digital periapical radiograph was done with shift technique to confirm the presence of two canals and the image revealed presence of two roots and two canals. Stainless steel (SS) K- files #6, #8, and #10 were used for creating glide path. Working length was determined by using apex locator (E-PEX PRO apex locator, Eighteeth) and then reconfirmed on the digital periapical radiograph as shown in figure 1a. Canals were prepared using manual protaper files (Dentsply). Irrigation of canals was done by 5 % Sodium hypochlorite (NaOCl) followed by saline, and then with 17% Ethylene Diamine tetra acetic acid (EDTA). After preparation calcium hydroxide was placed in the canal using lentulospiral, and access cavity was sealed by using temporary restoration (cavit 3M ESPE).

The patient was recalled after 10 days. The patient had no interappointment pain and the tooth was no longer tender to percussion. Cavit (3M ESPE) was removed, and Ca (OH)<sub>2</sub> was washed out of canals using normal saline. Paper points were used to dry the canals. After reassuring that canals are dried, and there is no pus or blood discharge within the canals, sealer (Sealapex, non-eugenol calcium hydroxide) was placed within the canals using lentulospiral. Canals were obturated using manual protaper gutta percha (Dentsply), as shown in figure 1b.

Post and core build up was done with prefabricated metal post (Dental gold-plated screw post, swiss) and nano hybrid resin composite (meta biome) followed by crown preparation for porcelain fused to metal (PFM) crown. Crown was cemented with type 1 GC luting agent (GC Corporation, Tokyo Japan) as shown in figure 1c & 1d.



*Figure 1: (a) Working length periapical radiograph, (b) Obturation (c) After post placement (d) Two rooted mandibular canine with post and crown.*

## Discussion

Clinicians should be aware of the root canal anatomy and possible variations that can exist within the community. Missed canals can lead to multiple visits and misdiagnosis of the clinical condition.[5] Vertucci, Green and Kuttler has reported 15% of canines with two canals. However, there may be two roots and two or three canals.[6]

According to H. Plascencia et al. occurrence of two roots and two canals may exhibit in 1-5%, and two root morphology has female predilection, as reported in this case.[7] Mandibular canines exhibit

only 15% of two canals, Vertucci's class V and very less frequently two roots morphology.[7] 85% of mandibular canine demonstrate Vertucci's class 1 configuration.[8]

For anterior single crown replacement lithium di silicate and layered zirconia have been preferred.[9] Many materials are available in the market thus choice of material will eventually depend upon the cost, benefits and limitations of the material, similarly in this case the patient opted for PFM crown due to less cost as compared to zirconia crown.[10] There was extrusion of sealer during obturation from apex, however, statistically extrusion of sealer (Sealapex) has no postoperative pain or effect on periapical healing.[11]

Patient was satisfied with her treatment. Had no post op pain at 3 month and 6 month follow up.

### Conclusion

This case report reveals the importance of proper clinical evaluation, pre-op radiographs, adequate access opening, and magnification. Clinicians should be mind-full of the fact that variations in morphology can exist, and any tooth can deviate from the usual pattern of tooth morphology.

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