

# PERMANENT MAXILLARY CANINE WITH TWO ROOT CANALS : AN ABBREVIATED CASE REPORT

## Authors:

<sup>1</sup>Dr. Sona Prabhakar N.

<sup>2</sup>Dr. Geethu M. R.

<sup>3</sup>Dr. Fathima Shamly A. V.

<sup>4</sup>Dr. Sonu Ravindran

<sup>5</sup>Dr. Sunil M. Eraly

<sup>6</sup>Dr. Priya R.

Department of Conservative Dentistry  
and Endodontics  
Malabar Dental College and Research Centre  
Manoor, Edappal, Kerala 679582

Senior Lecturer  
Department of Conservative Dentistry  
and Endodontics  
Malabar Dental College and Research Centre  
Manoor, Edappal, Kerala 679582

Professor and Head  
Department of Conservative Dentistry  
and Endodontics  
Malabar Dental College and Research Centre  
Manoor, Edappal, Kerala 679582

Professor  
Department of Conservative Dentistry  
and Endodontics  
Malabar Dental College and Research Centre  
Manoor, Edappal, Kerala 679582

### Address for correspondence

Dr. Sona Prabhakar N.  
Suprabha House, Kodakkad P. O., Chettipady  
Malappuram, Kerala 676 319  
E mail: sonaprabhakar04@gmail.com

## ABSTRACT

For successful endodontic treatment, the clinician should have thorough knowledge about the variations in the root canal morphology. The science of extra canal is important in endodontics as failure to locate and treat an extra canal is the prime cause for failure of root canal treatments. This case narrates about the treatment of a maxillary canine with two root canals with deep class III dental caries. Clinical examination revealed a maxillary canine with carious lesion and tooth showed no response to electric and thermal tests. Radiographic examination revealed a distal carious lesion (close proximity to pulp) and also appeared to have an additional canal in this tooth. Therefore, endodontic treatment was done and the patient reported complete relief of pain and found to be asymptomatic on review.

**Key words:** Maxillary permanent canine, endodontic treatment, root canal anatomy, two root canals.

J Ind Dent Assoc Kochi 2020;2(2):23-26.

## INTRODUCTION

Two root canals in a permanent Maxillary canine is a rare condition as these teeth are usually single-rooted and single-canaled<sup>1</sup>. The pulp canal system in any tooth has the probability of being very complex with a network of branches throughout the length of the root<sup>2</sup>. The proper knowledge about the root canal anatomy can directly affect the prognosis of the treatment<sup>3</sup>. The prime reason for the failure of root canal therapy is insufficient knowledge of pulp space anatomy and inability to negotiate and properly obturate the canal<sup>2</sup>. The clinician should be aware of the anatomy of the tooth before starting the procedure to prevent this failures<sup>4</sup>. Radiographs from different angles are a prerequisite to study morphological aberrations of root canal system<sup>5</sup>. Additional root canals if not identified are a major cause for unsuccessful root canal therapy<sup>1</sup>. Vertucci et al. classified the root canal configurations of human permanent teeth into several types extending from single to three separate canals<sup>2</sup>. Teeth having multiple canals and multiple roots in the maxillary anterior teeth region with or without any developmental anomalies have been reported<sup>3</sup>. In maxillary canine, the prevalence of double

canal is seen to be as low as 2.8% in Indian population with slight female predilection<sup>2</sup>. In this case report, we describe a case of two canals in a single-rooted maxillary canine.

## CASE REPORT

A 32-year-old female patient was reported to the department of conservative dentistry and endodontics of Malabar Dental College and Research Center, with a chief complaint of decayed left upper front teeth for 2 months. There was a history of sensitivity on taking cold foods associated with the same tooth which was noticed 1 week before. On clinical examination, extensive class III dental caries concerning maxillary left canine (tooth number 23). A positive response to the percussion test was revealed. Tooth showed no response to electric and thermal tests. The pre-operative radiograph shows coronal radiolucency involving enamel and dentine extending to the pulp in the mesial surface. Radiograph also revealed two separate radiolucent lines running till the middle third of the root suggestive of two canals and associated with a slight widening of PDL space. (Figure 1).

Local anesthesia was administered and a medium thickness rubber dam (GDC, India) was placed to isolate tooth #23. Access to the pulp canal space was achieved using a round diamond bur (SS White, New Jersey). Further modification and exploration in the access cavity demonstrated the presence of an additional canal orifice, lying palatal to the main canal [Figure 2]. Working Length was determined using radiograph and apex locator (J MORITA ROOT



Fig.1 : Pre op. 23



Fig.2 : Working length 23

ZX II, USA) and it was found that the palatal canal joined the buccal canal at the apical third of the root (type II configuration of Vertucci classification of root canal configurations). The canals were cleaned and shaped using hand instruments (k files –Mani, Japan) by step-back preparation. Apical preparation was done to size 40 k file in both canals (Mani, Japan). Irrigation performed using 5 ml 3% sodium hypochlorite (TRU LON Jayna industries, Uttar Pradesh, India) and 5ml 17% ethylene diamine tetra acetic acid (Anabond Stedman, India) between each instrument<sup>6</sup>. As a final irrigation 10ml, 3% sodium hypochlorite was used using a 5ml syringe with a 30-gauge needle placed 1mm away from the working length<sup>4</sup>. The canals were dried with paper points and obturation was done by cold lateral condensation technique using Zinc oxide Eugenol sealer (Tubli-Seal, Kerr, USA), followed by post endodontic restoration (Filtek™ Z350 XT Universal Restorative Composite, USA.)<sup>4</sup> [Figure 3 & 4]. The patient was recalled after one week and found to be asymptomatic.



Fig.3 : Master cone 23

## DISCUSSION

Morphological features of the tooth may adversely affect endodontic procedures. Thorough knowledge of both the external and internal anatomy of teeth is an important aspect of root canal treatment<sup>5</sup>. The predominant factor in the failure of nonsurgical endodontic therapy is the failure to locate and fill a canal<sup>6,7</sup>. It is of crucial importance that all canals be located and managed during endodontic therapy.

In the present case report, Vertucci's classification (Vertucci's type II) was used for the classification of the canal morphology. It is considered a standardized method for categorizing root canal anatomical variations<sup>7</sup>. Bolla et al,<sup>8</sup> and Mohammed et al,<sup>9</sup> have reported Type II canal configuration in maxillary canines. The present cases had similar characteristics to that reported by Bolla et al, and Mohammed et al. Two distinct canal orifices were located.

A thorough and careful radiographic evaluation and endodontic exploration may show the way to identify additional canals<sup>4</sup>. Radiographs taken from different angles, some with a file in place may help find and locate extra canals<sup>1</sup>. It is important to identify periodontal ligament space that often projects on the tooth and may resemble a canal. In this case, the examination of the pulpal floor and radiographs were taken with a file confirmed the existence of the extra canal<sup>4</sup>.

The advanced diagnostic radiographic tools such as cone-beam computed tomography (CBCT) are very helpful to diagnose morphological variations if conventional radiographic



Fig.4 : Obturation 23

techniques provide less information. Besides, the use of magnification tools, sodium hypochlorite NaOCl bubble technique might help to locate any additional root canals<sup>10</sup>.

## CONCLUSION

Adequate knowledge of the basic root canal anatomy and its variations from normal is required for the success of the non-surgical root canal treatment. This case report shows the presence of two root canals in maxillary canine. Though such anatomic findings have been cited earlier, our case report highlights the importance of having detailed knowledge of all possible root canal irregularities practitioners should look for and never assume that all canal systems are simple. Angulated radiographs and magnification devices are important tools in diagnosing and treating such cases.

## REFERENCES

1. Kandasamy S, Balakrishnan N, Chandrasekar M. A Three-Rooted Permanent Maxillary Canine: A Rare Anatomical Variant. *J Pharm Bioallied Sci.* 2019;11:S485-S487.
2. Alenezi MA, Al-Hawwas AY. Permanent mandibular canine with two roots and two root canals: Two case reports. *Saudi EndodJ.*2016;6:98-100.
3. Vertucci F: Root canal anatomy of the human teeth. *Oral Surg Oral Med Oral Pathol.* 1984;58:589-599.
4. Malik A, Bansal P, Nikhil V, Singh D. Biradicular mandibular canine: A review and report of two cases. *Endodontology.*2018; 30:159-62.
5. Abdalgawad RA, Aljohani MZ, Taymour NM. Mandibular permanent canine with two root canals, two roots: Case report, Al-Medina, Saudi Arabia. *Biomed J Sci & Tech Res.*2019;20:14729-32.
6. Acharya N, Hasan MR, Kafle D, BadruddozaDithi A, Saito T. A Rare Morphological Variation of Mandibular Anterior Teeth with Double Canals. *Ann Clin Case Rep.* 2019; 4: 1701.
7. Hulsmann M, Schafer E. Problems in gaining access to the root canal system. In: Hulsmann Michael, Schafer Edgar editors. *Problems in Endodontics: Etiology, Diagnosis, and Treatment.* 1 st ed. Germany: Quintessence Publishing Co Ltd; 2009. p. 145-72.
8. Bolla N, Kavuri SR. Maxillary canine with two root canals. *J Conserv Dent.*2011 Jan;14(1):80-2.
9. Mohammed NM, Mandora AO, Alqashqari TA. Maxillary canine with two root canals. *Saudi Endod J* 2015;5:146-8.
10. Patel S, Brown J, Pimentel T, Kelly RD, Abella F, Durack C. Cone-beam computed tomography in Endodontics - a review of the literature. *Int Endod J.* 2019;52(8):1138-1152.