An exclusive case report on endodontic management of unusual autarchic morphology of permanent maxillary canine with two canals in single rooted teeth

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Abstract
Root canal treatment is crucial for complete debridement of the 3- dimensional obturation to obtain fluid impervious seal. Root variation in the root canal system can lead to difficult task to the endodontists during the management. For such abnormal variations proper treatment planning should be considered for successful root canal treatment.

Keyword: Maxillary canine, Two Canals, Single root, Root canal treatment.

Introduction
Proper investigation of the extra roots or canals in root morphology is the important factors for succeeding in the endodontic therapy. The maxillary canines are mostly single rooted with one canaled teeth in 97% of the cases but existence of additional root or canal in permanent maxillary canine is exceptionally rare condition.[1] Vertucci's categorized the root canal classification of human permanent teeth into several types ranging from single to three separate and distinct canals.[2] Improper identification of the extra root or extra canal during root canal therapy can lead to failure and may affect the prognosis.[1] This current case report shows the maxillary permanent canine with two canal in single rooted teeth.

Case Report
A 44 years old male patient reported to the Department of Conservative and Endodontics with chief complain of pain in upper front region. The pain was sharp, continuous in nature and aggravated on taking cold and heat stimulation and relieves while taking medication. No medical history was given. On clinical evaluation the upper right maxillary canine deep proximal carious lesion which was tender on percussion, radiography analysis was done and on examination its reveals that presence of periapical pathology on root apex of affected teeth and the teeth was diagnosed with chronic irreversible pulpitis (Fig. 1. A).

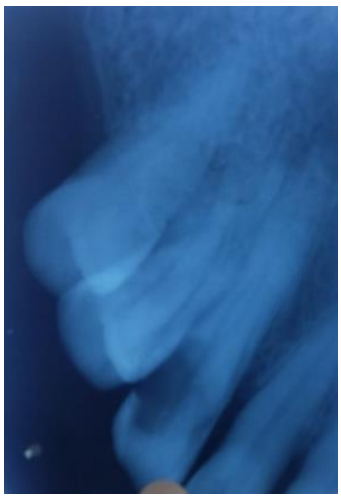

Fig. 1 (A): Pre- Operative radiograph #13.

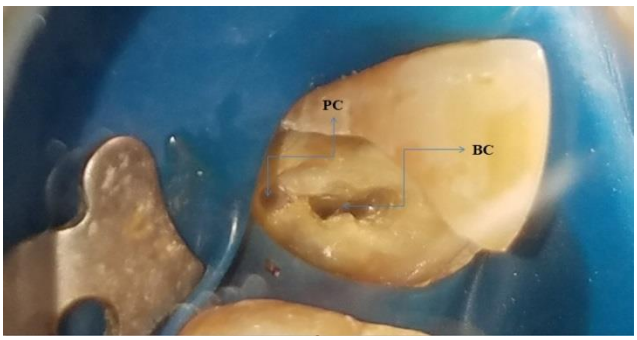

Fig. 1(B): Showing two canal orifices with #13.

After clinical and radio-graphical interpretation the endodontic treatment was suggested to the patient. The tooth was anaesthetized followed by rubber dam (Hygenic) isolation. Access cavity was prepared and the canals orifices were negotiated using a sharp DG16 explorer. (Fig. 1.B)

Pulp extirpation was done, and apical patency was achieved, with# 10K file (Dentsply-Maillefer), the working length was assessed with the help of electronic apex locator (E- connect S), (Orikam), and radiograph was also taken to checked the working length. (Fig. 1.C and D) For confirmation of two canals in permanent canine CBCT scan was done.

Fig. 1(C): Working length determination with #13.

Fig. 1(D): Axial view of CBCT scan of two canal in permanent canine at three different level i.e. cervical, middle and apical region.

Biomechanical preparation was performed using stainless hand files. During the preparation 3% sodium hypochlorite solution and 17% EDTA was used as irrigant alternatively after every instrument change. Apical preparation was done till 30k size for both the canals, after completion of bio-mechanical preparation and calcium Hydroxide was placed as a intracanal canal medicament and patient was reappointed after 7 days for obturation. In next appointment as the tooth was completely asymptomatic master cone radiograph was taken (Fig. 1E). The canals were dried using absorbent paper point and obturation was done using corresponding gutta percha 30/.02 using lateral condensation technique and sealapex (Kerr, SybronEndo). Post-obturation restoration was done using composite (Filtek Z250, 3M) and post-operative radiograph was taken (Fig. 1.F).

Fig. 1(E): Mastercone radiograph with #13.

Fig. 1(F): Obturation with post obturation restoration #13.

Discussion

The root anatomical studies which was done by various authors like Vertucci,[3] Pineda and Kuttler[4] reported that permanent maxillary anterior teeth have a single root with single root canal. This present case report shows Type II Vertucci's canal configuration i.e. two separate canals leave the pulp chamber and join short of the apex to form one canal. Alapati et al[5] and Onay et al,[6] stated Vertucci's Type II canal configuration in permanent maxillary canines.

The main goal of endodontic therapy is to clean the root canals of pulp tissue remnants,

microorganisms and bacterial products prior to obturation, thus making a favorable environment for periradicular tissues healing. Unable to negotiate missed canal has been revealed to be a causative reason in failure of endodontic therapy.[7] It is very important to locate the additional canals treated during root canal therapy. A detailed knowledge of the root canal anatomy is essential for successful treatment. In addition, a careful endodontic exploration as well as radiographs from several different angles may lead to suspicion or identification of additional canals and is certainly essential to give the highest possible chance for success.

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None.

Conflict of Interest
None.

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