

A RARE ROOT CANAL CONFIGURATION OF MAXILLARY CANINE : A CASE REPORT

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ABSTRACT

To report a case of endodontic treatment of a maxillary canine in which an extra canal was located and successfully treated. Endodontic therapy is essentially a micro neurologic surgical procedure involving complete debridement and three dimensional obturation of the root canal system to obtain a fluid impervious seal. The foundation of the procedure is based on the intimate knowledge and thorough understanding of the anatomy of both the pulp chamber and the root-canal system. A tooth exhibit variations in their root canal anatomy and poses a challenge in diagnosis and treatment. In the teeth particularly with additional root canals or anatomical variations, root canals are often left untreated and that would be main reason for unfavourable outcome of the treatment. Maxillary canine are statistically more commonly single rooted, single canal but rarely may have single root with two root canals.

KEYWORDS:- Obturation, seal, anatomy, diagnosis

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INTRODUCTION

Diagnosis and recognition of disparity in number of roots and canals are the main in endodontic treatment. The framework of the procedure is based on the bosom knowledge and thorough understanding of the anatomy of both the pulp chamber and the root-canal system. Teeth exhibit variations in their root canal anatomy and pose a challenge in diagnosis and treatment. The maxillary canine usually has a single canal. A small percentage of maxillary canines have two canals¹. Canines are universally referred to as the “cornerstone” of the dental arches². The most common root canal pattern in the maxillary canine was a Type I in 81.6% in Indian population³. Similar findings were reported by Vertucci⁴ (100%), Pineda and Kuttler⁵ (100%), Çalişkanet al⁶ (93.48%), and Sert and Bayirli⁷. The second most commonly occurring canal pattern in maxillary canines was Type III in 11.6% , followed by Type II at 2.8% and Type IV in 0.8%³.

CASE REPORT

A 42-year-old female patient with a non-contributory medical history was referred to the Department of Conservative Dentistry and Endodontics with chief complaint of pain in right upper front region of jaw since 15 days. Pain was continuous, severe in nature and became worse at night and aggravated by hot and cold stimuli and relieved on taking analgesics. Clinical examination revealed deep caries involving the pulp in right maxillary canine. On clinical examination it was tender on percussion with no mobility. Lingering pain in cold test. Radiographic examination revealed a distal radiolucency involving enamel dentin and invaded the pulp chamber space (fig:-1). There appeared to be a widening of the periodontal ligament space at the apex of the tooth.

A diagnosis of symptomatic irreversible pulpitis with symptomatic apical periodontitis was established. Local anesthesia was administered and a medium thickness rubber dam of 6x6 inches (GDC, India) was placed to isolate tooth. Access to the pulp canal space was achieved using a round diamond bur (Dentsply, Mallifer) and two canals were located (fig 2). Working length of was determined using a digital radiograph (Gendex, Nort America) (fig 3). The canal was cleaned and shaped using ISO Standard hand k files (DENTSPLY, Maillefer). A 5.25% solution of sodium hypochlorite and normal saline were used alternatively as irrigants at every change of instrument. The canals were obturated after master cone x-ray (fig 4) with gutta-percha and sealer (DENTSPLY, Switzerland) using a lateral condensation

technique (fig 5). The patient was recalled after 3, 6 & 12 months and (1 year) (fig 6) for follow up and found to be asymptomatic and healing periapical radiolucency.

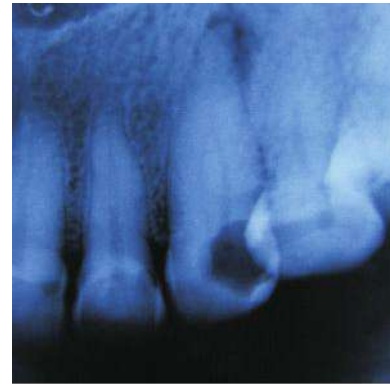


Fig 1:- Diagnostic radiograph



Fig 2:- Access opening and two canal located

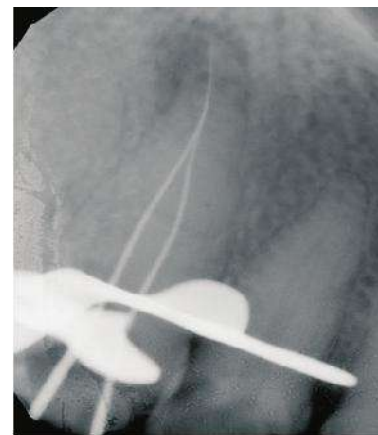


Fig 3:- Working length determination



Fig 4:- Master cone x-ray

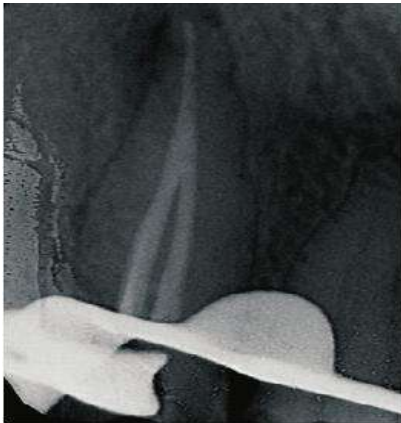


Fig 5:- Post obturation x-ray



Fig 6:- 1 year follow up

DISCUSSION

Failure to locate and fill a canal results in unsuccessful endodontic therapy. Therefore, it is imperative to have knowledge of anatomic variations as endodontic success is related to canal debridement. The difficulty in diagnosis and canal superimposition on diagnostic radiographic should be considered in mind when dealing such case. Vertucci (1984) classified root canals according to number of canals present and their configuration into eight types⁴.

Based on the literature and this clinical case, it is evident that knowledge of the anatomical variations of the maxillary canine is extremely important for the success of endodontic treatment. According to Cohen and Burns⁸, canals are often not treated because they are not located. The clinician should give special attention to the evidence of the occurrence of anatomical variations throughout the procedure. In the present case, during access, removal of the caries, coronal pulp and exploration of the canals, the presence of the bleeding on the pulp chamber floor was indicative of more canals and aided in the location of the palatal canals.

In the present case, radiographic image showed Vertucci type II [2-1] configuration. Studies of maxillary canines revealed only one root canal to be present (Pineda & Kutler 1972⁵, Vertucci 1984)⁴. Caliskan et al (1995)⁶ reported that the main root canal system in maxillary canines could diverge into two separate root canal systems as the canal progressed apically. The root canals either converged along their course to end in a common apical opening or terminated as two distinct apical foramina. The highest reported incidence; however, is that of a single root canal system, accounting for 93.48% of all screened teeth in a Turkish population (Caliskan et al. 1995)⁶, 75.4% in Chinese Guanzhong population (Weng X et al. 2009)¹⁰ and 94.2% in Sri Lankan Population (Pitakotuwage N et al. 2008)¹¹. The majority of maxillary canines have one root canal system, but according to Caliskan et al.⁶ 4.35% and Weng X et al.¹⁰ 2.3% may have two root canals but exit as single canal (Type III) and 2.17% may have two distinct root canals with separate apical foramina (Type V)⁶, both of which should be identified and managed (Hulsmann M and Schafer E 2009)¹².

CONCLUSION

Diagnosis and detection of extra canals require awareness on aberration of tooth morphology. Special care during endodontic exploration, radiographs with different angulations, and use of magnification with loupes and surgical microscope, aids in successful detection and treatment of extra canals.

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