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CASE REPORT

ENDODONTIC TREATMENT OF MAXILLARY CANINE WITH TWO CANALS

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ABSTRACT

Maxillary canines are as a rule considered being single rooted with a single canal. Few reports of presence of maxillary canines with additional canals have been reported in the literature. This article describes Endodontic treatment of a maxillary canine with two canals. The literature pertaining to unusual anatomy of maxillary canines has been reviewed.

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INTRODUCTION

Identification and treatment of the entire root canal system is one of the key factors for successful endodontic treatment. Maxillary canines are as a rule considered being single rooted with a single canal. However a few cases of two root canals have been reported in literature (Sabala *et al.,* 1994; Pineda *et al.,* 1972). Failure to locate and treat a canal is the most causative factor of endodontic failure. The root canal system of any tooth always has the possibility of being very complex. Maxillary canines with more than a single canal or single root with or without developmental anomalies have been reported in literature. Hence a thorough knowledge of the entire root canal anatomy is important for the success of endodontic therapy. The present case reports Endodontic treatment of single rooted maxillary canine with two root canals.

CASE REPORT

A 55-year-old male patient with a non-contributory medical history reported to the Department of conservative dentistry and endodontics with pain in his upper right teeth. Clinical examination revealed a deep carious lesion in his maxillary right canine and a radiograph confirmed the same with no periapical lesion (Fig 1). However there was no pain on percussion. Vitality test (RC Ice, Prime Dental) induced an exaggerated response.

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A diagnosis of irreversible pulpitis was made and it was decided to carry out endodontic treatment. An informed consent of the patient was taken after which 2 % lignocaine was administered. The concerned tooth was isolated with rubber dam and a conventional access cavity was prepared to expose the canal orifice. A closer examination revealed two orifices (Fig 2) and hence the access cavity was modified to expose the second orifice which was situated slightly more palatally. The entire pulp tissue was removed and the working length was measured using an apex locater (ROOT ZX: MORITA). Radiograph (Fig 3) confirmed the presence of two canals which united around 3mm before the apex (Vertucci, Type II). The canal orifices were widened using Gates glidden drills and biomechanical preparation was carried out using K flex files (Mani). Irrigation was carried out using 5% percent sodium hypochlorite and instrumentation was done to apical size of 40. A temporary dressing (Cavit G) was placed and the patient was recalled after a week. The tooth was asymptomatic and hence obturation was planned. The master cones were selected and confirmed by radiograph (Fig 4). Sealapex (Sybron Endo) was used as the sealer and obturation was done by lateral condensation method. A radiograph was taken to confirm and a temporary dressing (Cavit G) was placed (Fig 5). The patient was recalled after a week for full coverage crown.

DISCUSSION

The root canal system of any tooth has the potential of being very complex with various bifurcations along the length of the root. A lot of studies have been carried out in the last few years related to pulp anatomy.

Figure 1. Preoperative radiograph showing deep carious lesion in canine

Figure 2. Access cavity shoeing 2 orifices

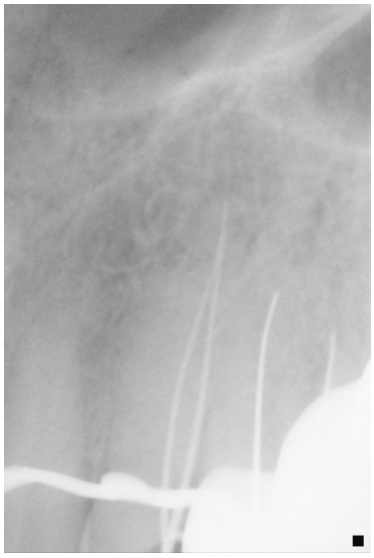

Figure 3. Working length radiograph showing two separate canals joining in apical 3rd

Figure 4. Master cone radiograph

Figure 5. Radiograph showing obturation by lateral condensation

Vertucci (1984), Pineda and Kuttler (1972), Black and Green (1956), all in their anatomical studies have mentioned that maxillary incisors have a single root in 100 % of the cases. Permanent maxillary canines with type V canal configuration was reported to be 2.17% and type III canal configuration was reported to be 4.35% (Pineda and Kuttler, 1972). However there was no report of type II canal configuration. Sonal bansal *et al.* reported a type IV canal configuration in a maxillary canine (2016). Majority of maxillary canines have a single canal however, according to Caliskan *et al.* 1995 4.35% and Weng *et al.* 2009 2.3% may have a two distinct root canals with separate apical foramina. Alapati et al reported a maxillary canine with type II canal configuration (Alapati *et al.,* 2006). Ravi SV reported a maxillary canine with type II canal configuration (Ravi, 2011). Dong- Ryul Shin et al reported a maxillary canine with two separate root canals(type IV) (Dong- Ryul Shin *et al.,* 2011). Weisman reported a bi rooted maxillary canine (Weismann, 2006). The present case shows a type II canal configuration. Two distinct orifices were found in labial and palatal configuration. The palatal canal eventually curved and united with the main canal. To locate the additional canals the clinician should be aware of the variations and the clues that suggest their presence. Also when locating an

additional canal, periodontal space that often projects onto root surface resembling a canal should be differentiated (Jaya Nagendra Krishna Muppalla *et al.,* 2015). A proper exploration of the floor of the pulp chamber, with radiographs at different angles can help in location of additional canals. Most of the above reported studies were done by radiographs. Their main limitation was a 2 dimensional image of a 3 D object. CBCT (Neelakantan *et al.,* 2010), Spiral CT (Subha *et al.,* 2013) and 3D Acciutomo XYZ Slice View tomography (Nakata *et al.,* 2016) are other methods to view and study root canal anatomy.

Conclusion

This case report presents an unusual root canal anatomy in a maxillary canine. It emphasizes on the importance of the fundamental knowledge of root canal anatomy, their variations, interpretation of radiographs and implementation of modern techniques for successful endodontic treatment. This report is presented mainly to increase the awareness in clinicians that variation also exist in the anterior tooth group.

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