

DETECTION OF AN ACCESSORY ROOT IN THE MAXILLARY CENTRAL INCISOR AND ITS MANAGEMENT: A CASE REPORT

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ABSTRACT:

A successful endodontic treatment is achieved by a good obturation of the root canal system. Knowledge of the root canal anatomy and its variations is one of the factors in achieving this goal. This case report presents the diagnosis and management of an unusual maxillary central incisor with two roots. A 37 year old male patient reported with purulent discharge in maxillary right central incisor. Radiographic and CBCT examination revealed the presence of an accessory root. Conventional endodontic therapy was carried out. After one year, the tooth was asymptomatic and the lesion had healed.

Key words: Two rooted maxillary central incisor, Diagnosis, Cone Beam computed tomography, unusual root morphology

INTRODUCTION:

A thorough knowledge of the anatomical variations of the pulp cavity and root canals is required to ensure a rational approach to endodontic procedures. According to Vertucci, maxillary central incisor presents single root and single canal in about 100% of the cases [1]. However, some maxillary central incisors having a single root and more than one canal or two roots and two canals have been documented in the literature [2-7]. Greenfeld RS et al, have shown that multiple canals or roots in incisors are rare and have suggested that it could be due to the result of developmental anomalies and when encountered, such abnormal morphology may impede conventional endodontic treatment [8].

This article reports an unusual case of a two rooted maxillary central incisor and the effective use of CBCT (Cone Beam Computed Tomography) as a tool for its detection and management.

CASE DETAIL:

A 37 year old male patient reported with a discharge of purulent exudate in the region of maxillary right central incisor since 1 month. His medical history was non-contributory. Clinical examination revealed that the crown was normal with no sign of fracture or dental caries [Figure 1]. The tooth was tender on percussion and there was presence of intraoral swelling labially with sinus tract opening. Thermal tests were performed on the central incisor but it was non-responsive to heat and cold. Pre-operative

radiograph showed radiolucency apical to the tooth. [Figure 2]. Gutta-percha tracing was omitted as radiographic and vitality tests were already conclusive of the diagnosis. The right maxillary central incisor was diagnosed as having chronic periapical abscess.

After rubber dam application, conventional access cavity preparation was made with an Endo access bur (Dentsply Tulsa, Tulsa, OK). Initial instrumentation showed two different paths of insertion of files and an intra oral periapical radiograph was not conclusive regarding presence of two roots. Therefore, A CBCT (Cone beam computed tomography) was advised to determine the possibility of the presence of an accessory root. CBCT showed presence of one main root, and a second, very slender and short root mesially. [Figure 3 and 4].

The working length was determined radiographically using Ingle's technique [Figure 5]. The root canals were cleaned and shaped using hand K file (Maillefer Denstply, Switzerland) instruments with a step-back technique. The main canal was instrumented to master file size of 60 and accessory canal to size 35. The root canals were copiously irrigated with 3% Sodium hypochlorite solution. Finally, the canals were rinsed with 2% Chlorhexidine solution. Calcium hydroxide paste was then placed as intracanal medicament for 2 weeks with change of dressing after every week. After a period of two weeks, the tooth was found to be asymptomatic. Later, the root canals were obturated with Gutta-percha and Sealapex sealer (Sybron

Endo, USA) using lateral condensation technique [Figure 6 and 7]. At a one year follow up, the patient has remained asymptomatic and a radiograph was taken in relation to the maxillary right central incisor, which confirmed the presence of healing of periapical lesion [Figure 8].

DISCUSSION:

Root canal anomalies caused by fusion or gemination or enamel hypoplasia are revealed by coronal anomalies [2]. Some teeth present a root canal anomaly although it has a normal clinical crown. According to Sabala et al, root canal aberrations occurring in less than 1% of the cases were 90% bilateral [9] whereas Lin et al reported that two rooted maxillary central incisors were mostly unilateral [4]. In the present case, there was bilateral presence of maxillary central incisor with two roots having a normal clinical crown.

During root formation, the Hertwigs epithelial root sheath is bent horizontally at the CEJ causing the cervical opening of the tooth germ to narrow. Development of accessory root canal opening on the periodontal surface of the root could be due to any traumatic injury or any unknown factor which causes non-fusion of the horizontal extension of diaphragm [9].

Intraoral radiography, though commonly used, may mislead the clinician in diagnosis or treatment planning of teeth having complicated root canal systems. CBCT has been used in endodontics for the purpose of diagnosis of endodontic

pathosis and canal morphology, assessment of pathosis of non-endodontic origin, evaluation of root fractures and trauma, analysis of external and internal root resorption, invasive cervical resorption, and presurgical planning [10, 11]. The primary advantage of CBCT over radiography is reduced radiation exposure with improved diagnostic information and a three dimensional visualisation of the tissues. Therefore, CBCT was used for better understanding of the complex root canal anatomy in this case.

Calcium hydroxide was used as an intracanal medicament of choice due to its effective anti-bacterial properties that cause the periapical tissue to heal. Antibacterial action of Calcium hydroxide is by the ionic dissociation of Ca^{2+} and OH^{-} ions and their effect on vital tissues, thus generating an induction of hard

tissue deposition [12]. 2% Chlorhexidine was used as a final irrigating solution, as it has anti-bacterial substantivity in the dentin up to 12 weeks. Using Chlorhexidine as an irrigant delays the bacterial contamination of the root canal which enters through the coronal restoration or tooth interface [13].

CONCLUSION:

The major reason for failure of cases in well obturated root canal is caused by the missed accessory canal. For locating the orifices, the application of proper aids is very important. Cone beam computed tomography is an important imaging technique that provides images with sufficient spatial resolution at a low dose. Therefore it is necessary to effectively make use of its application in endodontic diagnosis, treatment planning and post treatment evaluation.

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FIGURES:



Figure 1: Photograph showing clinically normal maxillary right central incisor



Figure 2: Preoperative radiograph showing maxillary right central incisor



Figure3: CBCT image showing presence of an accessory root

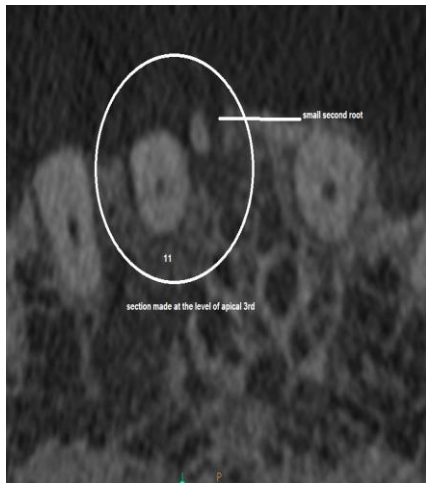


Figure 4: Axial view of the two roots



Figure 5: Working length radiograph showing two different path of insertion of files



Figure 6: Master cone radiograph



Figure 7: Post operative radiograph



Figure 8: One year follow up radiograph