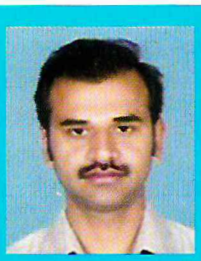
Vertucci Type VII Canal Configuration In Maxillary Second Premolar - A Rare Case Report

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Abstract

Anatomical variations must be considered in clinical practice and proper radiographic evaluation must be done during endodontic treatment.

Access cavity modifications may be required for proper assessment of complex root canal anatomy. Higher magnification and illumination can be useful to recognize and locate additional canals. This article describes the diagnosis and clinical management of a rare case with type VII root canal anatomy in maxillary second premolar.

Keywords: Maxillary premolars, vertucci's classification, root, morphology.

INTRODUCTION : Root canal morphology and anatomy is often complex than it appears clinically and radiographically. These pose problems to the endodontist while performing endodontic therapy. Maxillary premolars are reported to vary in their root canal anatomy to a great extent. It is the only tooth type which was shown to possess all the types of canal configurations known at present. Vertucci classified root canal configuration as follows. (*Type I)* A single canal extends from the pulp chamber to the apex. (*Type II*) Two separate canals leave the pulp chamber and join short of the apex to form one canal. (*Type III*) One canal leaves the pulp chamber, divides into two within the root, and then merges to exit as one canal. (*Type IV*) Two separate and distinct canals extend from the pulp chamber to the apex. (*Type V*) One canal leaves the pulp chamber and divides short of the apex into two separate and distinct canals with separate apical foramina. (*Type VI*) Two separate canals leave the pulp chamber, merge in the body of the root, and redivide short of the apex to exit as two distinct canals. (*Type VII*) One canal leaves the pulp chamber, divides and then rejoins within the body of the root, and finally redivides into two distinct canals short of the apex, (Fig. 1). (*Type VIII*) Three separate and distinct canals extend from the pulp chamber to the apex. [1]

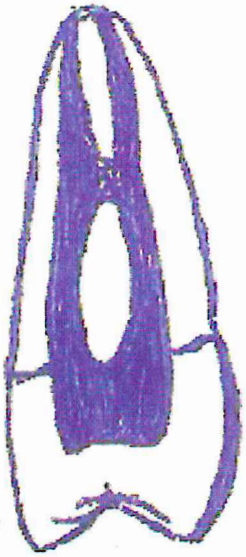

Fig 1. Vertucci's type VII (1-2-1-2) root canal pattern.

The incidence of Vertucci Type VII canal configuration (1-2-1-2) reported are rare and only a few reports available in the literature. A study by Singla *et al* in 90 extracted maxillary second premolar using radiographs has not revealed even a single tooth with Vertucci type VII canal configuration. [2] A recent in vivo study by Aggarwal *et al* in Indian sub population using spiral computed tomography

has shown only one tooth with Vertucci type VII canal configuration among the 121 teeth studied. [3] Sharma and Mathur has found only 1.67% in their study in Indian population.[4] Raj and Mylswamy found the incidence to be 1%.[5] Other authors have found 0-3.7% incidence of type VII canal configuration in various populations.[6,7] This shows that this is a rare incidence in endodontic practice, still the endodontist should be aware of this anomaly. This case report shows a maxillary second premolar with vertucci type VII canal configuration managed successfully.

CASE REPORT

A 24 year old patient reported to the Department of Conservative Dentistry and Endodontics, Bapuji Dental College and Hospital with a chief complaint of pain in upper left back teeth region. Clinical examination revealed a deep Class II distal caries in maxillary left seond premolar (25) and the tooth was tender on percussion. Intraoral periapical radiograph (IOPA) revealed disto coronal radiolucency approximating pulp chamber space with well defined periapical radiolucency. A diagnosis of chronic periapical abscess was done. A treatment plan of root canal therapy was decided.

Caries was excavated with round carbide burs in a slow speed hand piece and endodontic access cavity was prepared. Examination of access cavity revealed the presence of single canal orifice splitting into two canals (Fig 2). Working length was determined using Propex 2 apex locator (Densply, and confirmed using radiograph. Cleaning and shaping was done using rotary protaper and hand K-files. Sodium hypochlorite irrigant was used during the procedure. Apical enlargement was done to a iso size corresponding to 35 K file. The canals were medicated with calcium hydroxide and glycerine paste for three weeks. In the subsequent visit the tooth was asymptomatic and obturation was done using gutta percha and AH Plus sealer using lateralcompaction technique.

Fig 2. Photograph showing maxillary first premolar with single root canal orifice dividing into two separate canals.

Examination of post obturation radiograph revealed the communication between the buccal and palatal canal in the junction of middle and apical third suggesting Vertucci type VII canal configuration (Fig 3).

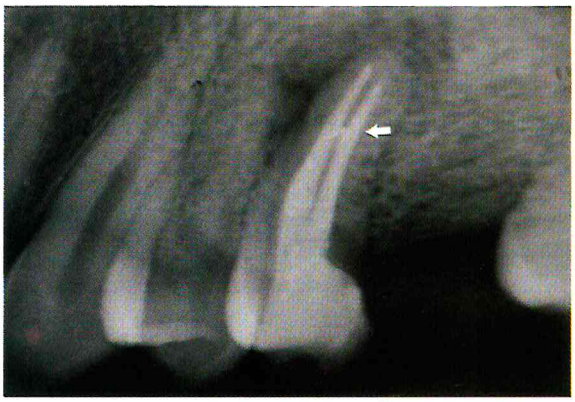

Fig 3: IOPA radiograph showing root canal obturation and communication between the buccal and palatal root canals at the middle third.

DISCUSSION

Numerous factors contribute to the variations found in the root canal like ethnicity, age, gender.[8] Incidence of type VII canal anatomy in maxillary premolars in non Indian population have been reported by Vertucci 2%, Sart & Bayirili 3% and.[9,10]

Complete cleaning shaping and obturation of the root canal system is essential for the success of root canal treatment. An inadequate knowledge about root canal anatomy can lead to misdiagnosis or missing canals at the time of performing endodontic therapy or results in complications.

Conclusion : This report has shown a rare case with a rare type of vertucci type VII canal configuration managed by root canal therapy.

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