



Management Of Maxillary Second Molar With Two Palatal Roots: A Case Report

KEYWORDS

Anatomical variation, maxillary second molar, two palatal roots

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ABSTRACT *An awareness and understanding of the presence of an extra root as well as unusual variations in root canal morphology is essential as it determines the success of the endodontic treatment. Aberrations in root canal anatomy and morphology are commonly occurring phenomena. A thorough knowledge of basic root canal anatomy and its variations is required for successful completion of endodontic treatment. This case report presents diagnosis, treatment planning and treatment of a maxillary left second molar with two palatal roots.*

INTRODUCTION

One of a most challenging goal for the endodontists and the researchers are the perplexing complexity of the Root canal system. In spite of all procedural protocol if clinician's miss an additional root or canals, it can lead to failure of the treatment. Various studies has been done to investigate the presence of an additional canal or roots. One of the most important study was performed by Walter Hess¹, who injected the root canals with a specific ink and visualized the huge amount of variables and complexities of root canal systems. He published the first extensive report on this subject. An additional third root in mandibular molar was first mentioned in the literature by Carabelli, is called the Radix Entomolaris (RE)². In RE the supernumerary root is located distolingual to the mesial root of the mandibular molars. Similarly an additional root at the mesiobuccal side of the distal root of the mandibular molar is called the Radix Paramolaris (RP)³.

Maxillary second molar variants have already been reported in many clinical cases as well as *in vitro* studies. Peikoff *et al*⁴ carried out a retrospective study in 520 completed endodontic treatments of maxillary second molar teeth. They classified the anatomical root and canal variations into six categories : (1) Three separate roots and three separate canals; (2) three separate roots and four canals (two in the mesiobuccal root); (3) three roots and canals whose mesiobuccal and distobuccal canals combine to form a common buccal with a separate palatal; (4) two separate roots with a single canal in each; (5) one main root and canal; (6) four separate roots and four separate canals including mesiobuccal root, , and distobuccal root with a single canal in each root and two separate palatal roots- mesiopalatal and distopalatal with its own separate canal

CASE REPORT

A 39-year-old male patient complaining of pain in the upper left back tooth since 2-3 days reported to the department of conservative dentistry and endodontics. Clinical examination revealed Deep dental caries with pulpal exposure with respect to tooth no 27. His Medical and Dental history were Non-relevant. On percussion, the tooth was tender and vital-

ity testing with electric pulp tester (Parkell, INC, Edgewood, Newyork, 1717) was positive .On radiographic examination, coronal radiolucency encroaching the pulp was seen. It also revealed the presence of an extra palatal root (**FIGURE - 1**). Two radiographs in different angulations were taken to confirm the presence of an extra palatal root .Hence it was classified as Type VI as per peikoff *et al* classification. Diagnosis was confirmed as Acute irreversible pulpitis with apical periodontitis with respect to tooth no 27

Pulp space therapy with respect to tooth No 27 was advised. After giving local anesthesia of lignocaine with 1:80000 adrenaline (Lignox 2% A -Indoco Remedies), rubber dam (Coltene /Wahledent Inc, 235, Ascot parkway, USA) was placed and access cavity preparation was done with No 2 Access opening round end cutting tapered diamond bur(Dentsply Maillefer, 1338, Ballaigues, switzerland) which revealed the presence of an extra palatal root while modifying the triangular shape to a trapezoidal shape to improve the access which was significantly far apart and larger in size. Working length was estimated with direct digital radiography . Working length of MB, DB , Palatal(1) and Palatal (2) were 18.5, 19, 21, and 23 mm respectively.

Cleaning and shaping was done upto no 20 K files (Dentsply Maillefer,CH-1338,Ballaigues,switzerland) and later with Rotary no 20 M two file system (VDW,Munich,Germany). Canals were irrigated with 3% of sodium hypochlorite and saline. Radiograph with 6% taper, apical diameter 20 master gutta-percha cone (Dentsply Maillefer, Ballaigues, switzerland) was taken .Canals were dried with paper points and obturated with Tubli seal (Sybronendo ,Unit 10, 112-118 Talavera Road Northryde, NSW, Australia 2113) sealer and 6% gutta-percha cone of apical diameter 20 .A microscopic picture of the four canal orifice was taken under a magnification of 8X with Carl Ziess digital operating microscope after obturation (Carl Ziess Surgical GmbH, 73446, Oberkochen , Germany) (**FIGURE - 2**)

Access cavity was sealed with Type IX , High strength posterior restorative GIC (GC Corporation, Tokyo, Japan)(**FIGURE - 3**)

FIGURE 1 (pre-operative direct digital radiography of maxillary left second molar)



FIGURE 2 (post obturation view using Carl Zeiss digital operating microscope)



FIGURE 3 (Direct digital radiograph after access restoration)



Discussion

Prevalence of additional roots and root canals has been widely reported and discussed by various authors, and a variety of study methodology including radiographs, magnification, clinical evaluations, dye injection, tooth sectioning, and scanning electron microscopy have been used^{5,6,7}. Various angulations of periapical radiographs are required for visualising extra roots. MSCT, CBCT, SAIGRAM (Non ionic iopromide) etc has been demonstrated for study of internal anatomy of the tooth^{8,9,10}. Various other anatomic variations of the root such as Dens Invaginatus has been managed by a combination of surgical and non-surgical endodontic therapy¹¹.

Krasner and Rankow's laws of pulp chamber Anatomy cannot be applied completely in case of Maxillary Molars for determining the Number and location of Root canal orifice.¹²

Formation of an additional root could be related to external factors during odontogenesis or penetrance of atavistic gene. Curzon suggests that additional rooted molar trait has high degree of genetic penetrance.⁽¹¹⁾ Anatomical variations can occur in maxillary permanent molars.

Conclusion

The variation in root or root canal morphology, especially in multirooted teeth, is challenging for diagnosis and successful endodontic therapy. The knowledge of common anatomic characteristics and their possible variation is Mandatory for the proper successful outcome of endodontic treatment. Accurate and clear radiographs has to be taken from different angulations and the Internal anatomy has to be carefully visualised and evaluated because missing of an extra root or canal can result in the failure of Root canal treatment.

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