ORIGINAL RESEARCH PAPER

Dental Science

KEY WORDS: Anatomic variations, Permanent maxillary first molar

ENDODONTIC MANAGEMENT OF PERMANENT MAXILLARY FIRST MOLAR WITH TWO PALATAL CANALS: A RARE CASE REPORT.

Dr,Marukala.Narendar Reddy* MDS Reader Department of conservative dentistry and endodontics S.V.S Institute of dental sciences Mahabubnagar, Telangana, India *corresponding author

Dr.Sainath Dinapadu MDS Reader Department of conservative dentistry and endodontics S.V.S Institute of dental sciences Mahabubnagar, Telangana, India

Dr.ManasaYarlagadda MDS Post graduate student Department of conservative dentistry and endodontics S.V.S Institute of dental sciences Mahabubnagar, Telangana, India

Dr.Rakesh Reddy Chukka MDS Senior LecturerDepartment of conservative dentistry and endodontics S.V.S Institute of dental sciences Mahabubnagar, Telangana, India

ABSTRACT

Thorough debridement of the root canal system is a prerequisite for successful endodontic therapy.To achieve this goal the clinician must identify all the root canals and to do so one must be aware of the various morphological variations that can occur. Maxillary permanent first molars present with many variations in the root canal morphology. Majority of maxillary first molars have three roots and 4 canals. This case series presents some anatomical variations in permanent maxillary first molar. In this case series the number of root canals ranged from 2 to 5.

Introduction

Successful endodontic therapy depends on thorough clinical ,radiographic examination and a detailed awareness of internal morphology of the tooth [1]. Aberrations in the root canal anatomy is a perpetual challenge and makes it difficult to achieve optimal results. An insight into commonly seen anatomic features is essential [2]. Maxillary first molars frequently present with variations in root canal morphology[1,2]. Here we present a series of cases pertaining to variations in the anatomy of permanent maxillary first molar

Case report 1

A 26 year old female patient presented with a chief complaint of spontaneous toothache in her right posterior maxilla for 2 days.

From the clinical and radiographic findings, a diagnosis of symptomatic apical periodontitis in relation to 16 and irreversible pulpitis in relation to 15was made and endodontic treatment was suggested to the patient Radiographic evaluation in relation to right maxillary first molar tooth did not indicate any variation in the canal anatomy(Figure 1). The tooth was anesthetized with1.8 mL of 2% lignocaine with 1:200,000 epinephrine (Xylocaine; AstraZeneca Pharma Ind Ltd, Bangalore, India) followedby rubber dam isolation. An endodontic access cavity was prepared.

Clinical examination with a DG-16 endodontic explorer (Hu-Friedy, Chicago, IL) revealed one canal opening in each of the distobuccal, mesiobuccal roots and 2 canal openings in palatal root (Fig 2). The working length was determinedwith the help of an apex locator (Root ZX,J Morita) andlater confirmed using a radiograph. Cleaning and shaping was done under rubber dam isolation using ProTaper nickel-titanium rotary instruments (Dentsply, MailleferBallaigues, Switzerland) with a crowndown technique. Irrigation was carried out using normal saline, 2.5% sodium hypochlorite solution. An inter appointment intracanal calcium hydroxide dressing(RC Cal, Prime dental products, India) was given.

At the second appointment, thepatient was free of symptoms. Obturation was completedby cold lateral compaction of gutta-percha and zinc oxide eugenol sealer.The tooth was then restored with a posterior composite resin core (Figure 3). The patient was adviseda full-coverage crown.

Discussion:

Athorough knowledge of root canal anatomy is a prerequisite for successful endodontic therapy.Generally permanent maxillary first molar presents with 3 roots and 4 canals. The three roots include 1 palatal root ,1 mesiobuccal root and 1 distobuccal root [3].Majority of mesiobuccal roots show 2 canals and palatal and distobuccal roots show 1 canal each [3]. Many cases have been reported regarding the anomalies in the anatomical presentation of maxillary first molars with the number of roots ranging from 1 to 4 and the number of canals ranging from 1 to 7 [4,5,6,7].Variations may be due to ethnic background, gender and age3.In the present case report the teeth presented with 3 roots and the 4 canals. The incidence of 2 roots according to Al Shalabi et al (2000) is [2].40%,according to Thomas et al(1993) 5.6% and according to Barrett(1925) 6.3%([3,8,9]). This case report has shown a similar configuration of root canals in the palatal root as reported by Johal et al10 .Such variations in the palatal root morphology have been reported by Hartwell and Thews [11,12].literature reviews have shown that the incidence of second mesiobuccal canals is about 54.7%3.With the use of advanced magnification aids such as surgical operating microscope the incidence of mb 2 canal reported was much higher[13].A two dimensional radiograph can alert the clinician about the morphology of the tooth but it would be of limited use to predict the presence of anatomical aberrations4. Careful observation of the deformation of stainless steel files can also provide valuable information regarding the canal anatomy[4].

This case highlights the variations in root canal morphology and it requires clinicians to be able to detect them in order to perform successful endodontic therapy.

Figure 1: Pre operative radiograph

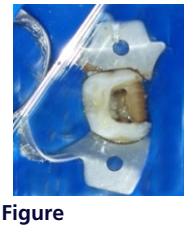
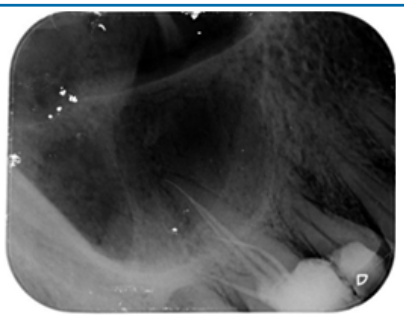


Figure 2: Clinical view Figure



3 : Post obturation radiograph

REFERENCES

1. Gopikrishna V, Reuben J, Kandaswamy D. Endodontic management of a maxillary first molar with two palatal roots and a single fused buccal root diagnosed with spiral computed tomography-a case report. Oral Surg Oral Med Oral Pathol Oral RadiolEndod. 2008 Apr; 105(4).
2. Sert S, Bayirli GS. Evaluation of the root canal configurations of the mandibular and maxillary permanent teeth by gender in the Turkish population. J Endod. 2004 Jun;30(6):391-8
3. Cleghorn BM, Christie WH, Dong CC. Root and root canal morphology of the human permanent maxillary first molar: a literature review. J Endod. 2006 Sep;32(9):813-21
4. Gopikrishna V, Bhargavi N, Kandaswamy D. Endodontic management of a maxillary first molar with a single root and a single canal diagnosed with the aid of spiral CT: a case report. J Endod. 2006 Jul;32(7):687-91
5. Kottoor J, Velmurugan N, Sudha R, Hemamalathi S. Maxillary first molar with seven root canals diagnosed with cone-beam computed tomography scanning: a case report. J Endod. 2010 May;36(5):915-21
6. Christie WH, Peikoff MD, Fogel HM. Maxillary molars with two palatal roots: a retrospective clinical study. J Endod. 1991 Feb;17(2):80-4
7. Hülsmann M. A maxillary first molar with two disto-buccal root canals. Journal of endodontics. J Endod. 1997 Nov;23(11):707-8
8. Al Shalabi RM, Omer JG, Jennings M, Claffey NM. Root canal anatomy of maxillary first and second permanent molars. Int Endod J. 2000 Sep;33(5):405-14
9. Thomas RP, Moule AJ, Bryant R. Root canal morphology of maxillary permanent first molar teeth at various ages Int Endod J. 1993 Sep;26(5):257-67
10. Johal S. Unusual maxillary first molar with 2 palatal canals within a single root: a case reportJ Can Dent Assoc. 2001 Apr;67(4):211-4
11. Bellizzi R, Hartwell G. Clinical investigation of in vivo endodontically treated mandibular anterior teeth. J Endod. 1982 Dec;8(12):555-7
12. Thews ME, Kemp WB, Jones CR. Aberrations in palatal root and root canal morphology of two maxillary first molars. J Endod. 1979 Mar;5(3):946
13. Sempira HN, Hartwell GR. Frequency of second mesiobuccal canals in maxillary molars as determined by use of an operating microscope: a clinical study. J Endod. 2000 Nov;26(11):673-4.