

THREE-ROOTED MAXILLARY SECOND PREMOLAR — A CASE REPORT

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ABSTRACT

An accurate diagnosis of the anatomy of root canal system is a prerequisite for successful root canal treatment. A review of the literature reveals a low incidence of maxillary second premolar with three canals. The incidence of maxillary second premolar with three roots and three canals is even lower. This case report describes the successful diagnosis and endodontic treatment of maxillary second premolar with three separate roots and three separate canals.

Key Words: *Three-rooted maxillary premolar, endodontic treatment.*

INTRODUCTION

The ultimate goal of root canal treatment is a thorough cleaning and shaping of all pulp spaces and the complete obturation of these spaces with an inert filling material.¹ Therefore, the knowledge of root canal anatomy of each tooth is crucial in order to reach this goal.²

The maxillary second premolar usually has one root and one canal in 75% of cases and one root and two canals in 25% of cases.³ A review of the literature reveals that the incidence of having three canals in maxillary second premolar is between 0.3%- 2%.^{4,5,6} The chances of maxillary second premolar having three roots and hence three canals are very low.⁷ Velmurugan et al 2005 found that out of 220 maxillary second premolars treated over two years only three had three roots and three canals with an incidence of 1.36%.⁷

Few cases of maxillary second premolars with three separate roots had been reported by some clinicians.^{8,9,10,11}

The aim in presenting this case report is to describe the successful diagnosis and endodontic treatment of maxillary second premolar with three separate roots and three separate canals.

CLINICAL REPORT

A 38 years old male patient came to the conservative clinic at Princess Aysha Bint Al-Hussein Medical Complex seeking replacement of old amalgam filling in the maxillary right second premolar due to fracture. The patient was also complaining from pain on hot and cold stimulation. The medical history of the patient was non contributory. Under local anesthesia (Ubistesin Forte 3M/ESPE, Seefeld- Germany). The old composite filling was removed, recurrent caries was found, during removal of the caries the pulp was exposed. The tooth was isolated with a rubber dam. An access cavity was prepared with sterile high and low speed burs with water coolant. After removal of the coronal pulp two canals were localized (one buccal and one palatal) periapical radiograph was taken to determine the working length (figure 1). The evaluation of the periapical radiograph together with the position of the buccal canal orifice suggested the possibility of the presence of a third canal. The access cavity was modified to a triangular outline (figure 2) and the pulpal floor was re explored carefully and a third canal orifice (second buccal) was found. Another periapical radiograph was taken to evaluate the working length (figure 3), this radiograph clearly confirmed the presence of three separate roots and three separate canals (two buccal and one palatal). The root canals were prepared in a crown-down method using gates glidden drills number 2, 3, 4 (Mani inc, Japan) at the cervical and middle thirds of the roots and hand K files (Mani inc, Japan) to the estimated working length. An apical stop was created with a size 30,35 K files. The canals preparation was finished with step back technique. Each file was followed by irriga-

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Received for Publication: July 14, 2013

Accepted: August 23, 2013



Fig 1: Initial working length determination showing only two canals.



Fig 2: Triangular access cavity showing the orifices of the three root canals

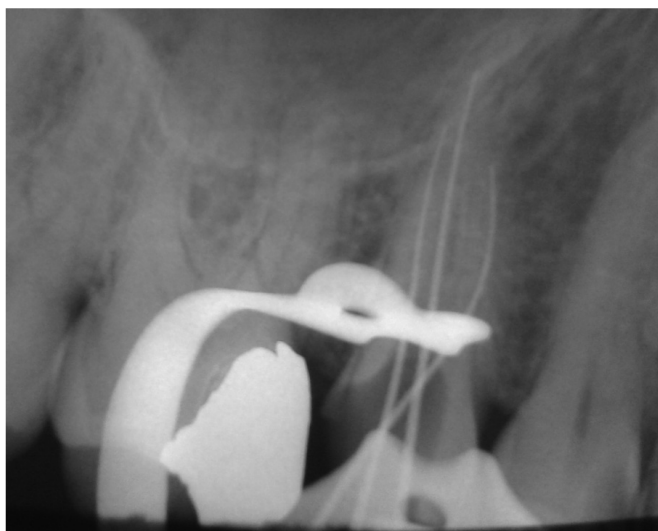


Fig 3: Final working length determination showing the three separate roots



Fig 4: Gutta percha filling of the separate root canals

tion with 2.5% sodium hypochlorite. After cleaning and shaping, the canals were dried with paper points (Roeko, Coltene/ Waledent-Germany) and filled with gutta percha (Roeko, Coltene/ Waledent-Germany) and AH26 sealer (Dentsply Dentry GmbH, Germany) by cold lateral condensation. The access cavity was sealed with amalgam filling. After root canal filling, a final radiograph was taken (figure 4) it showed the three separate root canals.

DISCUSSION

Many difficulties found in root canal treatment are due to variations in root canal morphology. The presence of extra root is challenge during case assessment and during all endodontic procedures including cavity design, canal localization, cleaning, shaping and filling of the root canal system.³

Maxillary second premolars may have one, two, or three roots and canals.¹ Two or three canals can occur in a single root.¹ Root canal anatomy of the maxillary second premolar is usually wider buccolingually than mesiodistally similar to those of the maxillary first premolar.¹ But the anatomy of three rooted maxillary second premolar is similar to that of adjacent maxillary first molar therefore, they are sometimes called small molars or radiculous.¹² The buccal canals are normally close to each other and often covered by a projection of cervical dentine.⁹ The access cavity has to be modified to a triangular confirmation at the base in the buccal direction.¹³

Although the periapical radiograph gives a two dimensional image of a three- dimensional root canal system its interpretation may suggest the presence of extra canals or roots as in this case report.

For Jordanian population the root canal morphology of maxillary second premolar has not been studied. Therefore, the incidence of maxillary second premolars having three roots is not reported. Awawdeh et al 2008 found that 0.8% of Jordanian maxillary first premolars had three roots but their *in vitro* study didn't include maxillary second premolars.¹⁴

Although the three-rooted form in maxillary second premolar is rare, it is essential for every dentist to be aware of this possibility. the knowledge of such variation will assist clinicians in diagnosis and endodontic treatment.

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PAWD

Young female Pakistani dentists have announced a separate association for female dentists of Pakistan. It is called Pakistan Association of Women Dentists (PAWD).

Aims of the association are to help all the female dentists of Pakistan for continuing education and to provide guidance for post graduation.

PAWD has female focal persons in all major cities of Pakistan and in some other countries like UK, and Saudi Arabia. In future more focal persons from other countries will be included. This will provide exposure to PAWD members to the dental community of the world.

Registrations are open on facebook, website will be established soon.

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CORRIGENDUM

1. 2013; Volume 33(1): 13 Qualification of Dr. Shaheen Anjum should be read as BDS, FCPS
2. 2013; Vol 33(1): 30 The title of the article should be read as Non Hodgkin's Lymphoma — A grotesque Presentation.