Case Report

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ENDODONTIC RETREATMENT OF MAXILLARY SECOND MOLAR WITH POST TREATMENT DISEASE ASSOCIATED WITH MISSED EXTRA PALATAL CANAL: A CASE REPORT

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ABSTRACT:

Missed canals often lead to failure of endodontic treatment. A clinical case of maxillary right second molar with missed extra palatal root canal is being reported. The case was successfully managed after the location of extra palatal root canal. Modifications to the normal access opening and examination of the pulpal floor for additional canals are stressed. The need of good quality radiographs at multiple angulations is being highlighted. Whenever an endodontist is confronted with unusual difficulties and patient complains of persistent post- obturation pain, the possibility of an extra canal or root has to be borne in mind.

Key Words: maxillary second molar, missed canal, extra palatal canal, retreatment.

INTRODUCTION

Understanding root canal morphology is one of the most important steps in successful root canal treatment. Fahid and Taintor.[1] stressed that if a clinician cannot locate the root canal, it cannot be properly cleaned, shaped, filled and sealed. Insufficient knowledge of the anatomy of the teeth is one of the main reasons for failure of root canal therapy.

The maxillary second molars resemble the maxillary first molars anatomically. The distinctive morphologic feature is that the three roots are united closer and are sometimes fused. Also, they are generally shorter than the roots of the first molars and are that much curved. The second molars usually have only one canal in each root. Four canals are less likely seen in the second molars than in the first molar.[2]

Variations mostly could be seen in the mesiobuccal roots [3] and particularly the mesiobuccal canal in 30-80% of the cases.[4] However, the frequency of reports on two palatal roots with two canals is low.[5-9] Peikoff et al. reported a 1.4% incidence of four separate roots and four separate canals including two palatal roots in 520 maxillary second molars.[10]

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Al Shalabi et al.[11] and Çalişkan et al.[12] in their *ex vivo* study found 1.2% and 3.23% two palatal foramens in maxillary second molar, respectively. Libfeld and Rostein also examined 1200 teeth radiographically, and reported that four rooted maxillary second molars occurred in 0.416% of cases. [13]

This case report intensifies the complexity of maxillary 2 nd molar variation. It presents endodontic retreatment of a maxillary second molar having four canals, two found in the palatal root. The missed extra palatal canal was source of persistent pain and discomfort for the patient. It was located and obturated successfully, following which the patient was asymptomatic.

CASE DETAIL

A 34-year-old female patient reported to the Department of Conservative Dentistry & Endodontics, Himachal Dental College, Sundernagar with the chief complaint of pain in relation to upper left back region since one week. She had undergone root canal treatment for the same tooth, one month back; but since then she had mild discomfort and difficulty in chewing food in that tooth. The medical history was non-contributory.

The clinical examination showed an occlusally restored maxillary left second molar (#27). The tooth was tender on percussion. Pre-operative peri-apical radiograph revealed obturated tooth # 27, with three canals namely; mesiobuccal, distobuccal and palatal (figure 1). Careful observation of the radiograph showed unusual anatomy of the palatal root. Several radiographs were taken at different angulations which confirmed the presence of second canal in the palatal root of tooth # 27. Hence the diagnosis of post treatment disease owing to missed canal was made and retreatment was planned. The patient was explained about the status of tooth and the treatment plan. She agreed for the retreatment and her written consent was taken.

The treatment was started with administration of local anesthesia using 2% lignocaine with 1:200000 adrenaline. The coronal restoration was removed and rubber dam isolation of the tooth was done (Hygienic Corp., USA). A usual triangular access cavity was modified to square-shaped (rhomboidal) using cavity access set (by Dentsply Mail-lefer, Ballagues). After access opening, the gutta percha was removed from the mesiobuccal, distobuccal and palatal roots using H-files (Mani). The complete removal was ensured with a radiograph. Following this exploration for the missed canal was done. The careful examination of the floor of the pulp chamber with surgical loupes (EyeMag® with ×2.5 magnification, Dental Microscopes and Dental Loupes by Carl Zeiss Meditec) and DG-16 Endodontic explorer showed 2 nd palatal root canal. Ultrasonic tips (Dentsply Maillefer, Ballaigues, Switzerland) were used to remove the dentin. It was located approximately 1 mm distally from main palatal canal orifice. The two palatal canals were named as mesiopalatal and distopalatal. The working lengths were determined

with an apex locater (Propex II, Dentsply Maillefer, Switzerland) and were confirmed radiographically (figure 2A & 2B). The radiograph demonstrated two separate palatal canals, apparently fused in the coronal third but clearly separated from middle third till the apex of the palatal root. The cleaning and shaping of the canals were done by a passive Crown Down technique using Protaper Ni-Ti rotary files (Dentsply Maillefer, Ballaigues, Switzerland). Root canal filling done with appropriately sized gutta-percha points (Dentsply Maillefer and SybronEndo, respectively) and Sealapex sealer (Kerr Co., Romulus, MI, USA). On completion of the root canal therapy, the tooth was restored with composite resin materials and a periapical radiograph was taken.(figure 3). At one month recall the patient was asymptomatic.

DISCUSSION

The clinician should always consider the possibility of anatomic variations throughout the endodontic procedure. The missed canals harbour pulpal remnants and microorganisms which lead to post treatment disease. In the present case, the patient had persistent discomfort in her root canal treated tooth because of missed canal. [14]

Radiographic examination is an essential component of the management of endodontic problems. The amount of information gained from conventional radiographs and digitally captured periapical radiographs is limited by the fact that the three dimensional anatomy of the area being radiographed is compressed into a two-dimensional image.[15] Radiographic interpretation of the second maxillary molar root anatomy presents complications because of superimposition of roots on each other or adjacent bony structures. Thorough knowledge of anatomical variations and frequent anomalies in the region besides multiple radiographs with different angles or cone-beam computed tomography (CBCT) could be helpful, the advantage over the conventional radiograph it being the three-dimensional image and also allows the operator to look at multiple slices of tooth roots and their root canal systems.[6,16-19] CBCT images always result in the identification of the greater number of root canal systems than digital images.

Meticulous exploration of the developmental groove in the pulp chamber floor is suggested in order to locate canal orifices; moreover, any dentin projection, which could cover existing orifice, should be removed carefully.

CONCLUSION

Maxillary second molars with two palatal canals often seem to have wider mesio-distal dimensions over the palatal cusps. Hence, a trapezoidal access opening would be more desirable than a triangular opening to identify two palatal canals to achieve success. Radiographs are still the indispensable tools for identifying the variations in root canal morphology.

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FIGURES:

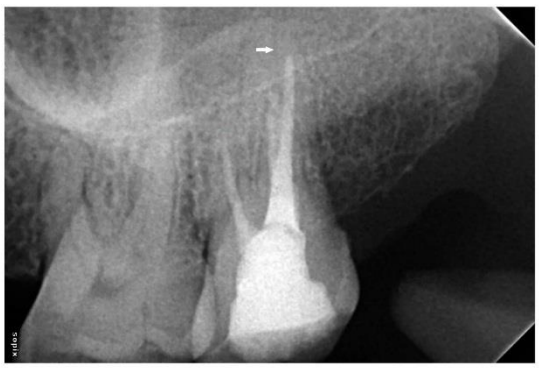

Figure 1

Figure 1: Pre-operative radiograph of tooth # 27 showing three obturated canals namely; mesio-buccal, distobuccal and palatal. The radiograph describes the missed canal in the palatal root. This missed canal was responsible for persistent post-operative pain following initial root canal therapy.

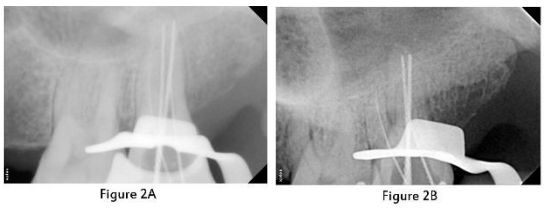

Figure 2A Figure 2B

Figure 2A & 2B: Working length radiographs at different angulations confirming the presence of extra palatal canal. The files can be seen inside mesioobuccal, distobuccal and two palatal canals. These radiographs confirm the presence of extra canal in the palatal root.

Figure 3

Figure 3: Post –obturation radiograph showing the two distinct palatal canals; namely; mesiopalatal and distopalatal. The coronal part of the tooth was restored with composite material.