

ENDODONTIC MANAGEMENT OF A MAXILLARY SECOND MOLAR WITH DOUBLE PALATAL ROOTS- A CASE REPORT

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ABSTRACT:

Knowledge of the root canal anatomy of the individual teeth and the aberrant variations that can occur in their root canal morphology is a criterion of utmost importance and as a prerequisite for the successful endodontic management of a tooth. With proper evaluation of the endodontically involved tooth, both clinically and radiographically along with other diagnostic adjuncts, these anomalies may be promptly recognized and managed and could ensure higher successful outcomes.

Keywords: Two palatal roots, maxillary second molar, root anomaly, extra root canal.

INTRODUCTION:

The goal of endodontic therapy is to precisely shape and clean the entire root canal system and seal it three dimensionally with obturating materials to ensure endodontic success.^[1] It is of paramount importance that, prior to treatment, a clinician have adequate knowledge of the root canal anatomy and anticipate possible variations, to minimize procedural mishaps.^[2,3]

In literature, presently there are very few citations of maxillary second molar with two palatal roots.^[4] Libfeld and Rostein, had radiographically examined 1200 teeth and reported an incidence of four rooted maxillary second molars being in 0.416% of cases.^[5]

Here, the nonsurgical endodontic management of an unusual case of a maxillary second molar with four roots is reported.

CASE DETAIL:

A 20-year-old female, was referred to the dental clinic for endodontic treatment of a maxillary left second molar from general practitioner. The patient had no significant medical history and was asymptomatic, except when food lodgement occurred in the region. On clinical examination there was deep proximal caries associated with the maxillary first and second molar on the left side. The radiographic examination revealed radiolucent lesions involving the pulpal chamber of both the molars. The second molar also showed an unusual root morphology (four separate

roots). There were two separate, long diverging roots (Fig:1).

However, based on the clinical, radiographic and pulp vitality testing results, a diagnosis of asymptomatic irreversible pulpitis was arrived at for the first and second maxillary molars and non-surgical endodontic treatment was planned.

After the patient's informed consent was obtained, local anaesthesia was administered and then the tooth was isolated with rubber dam. During access cavity preparation, the conventional triangular cavity shape was modified to a more square- rhomboidal shape to gain access to the extra root orifice, which was preset more mesially than the conventional location of the palatal canal orifice. After the pulp chamber was cleaned of all debris and was inspected, an unusual 'H' or 'X' type dentinal map pattern was observed. Then under a dental operating microscope the extra palatal canal was explored with a DG-16 explorer to confirm its presence and rule out the presence of the MB-2 canal. So, the canal orifices located were the mesiobuccal, mesiopalatal, distobuccal and distopalatal.

Then, the root canals working length was assessed using an electronic apex locator (Root ZX, J. Morita Corp., Tokyo, Japan) and thereafter, confirmed with a periapical radiograph. The shaping and cleaning of the root canals were done using rotary NiTi ProTaper instruments (by Dentsply Maillefer, Ballagues), along with Glyde as lubricant. The shaping

procedure was done up to F3 for each canal with copious irrigation using 3% NaOCl and 17% EDTA in each canal alternatively.

The canals were then adequately dried, cone fit checked for sufficient 'tug-back' effect and then final obturation of the canals were done by cold lateral condensation with GP cones (Dentsply Maillefer, Ballagues, Switzerland) along with AH-Plus sealer (Dentsply DeTrey, Konstanz, Switzerland). The coronal sealing was immediately done with composite resin to prevent coronal leakage. Finally the post-obturation radiograph was taken to confirm the obturation quality (Fig: 2).

DISCUSSION:

Anatomic anomalies or variations, though rare, do exist. Christie et al. in their study had reported that the incidence of four rooted maxillary molars with two palatal roots in ones busy endodontic practice to be once in every 3 years. The study by Yang et al. concluded that the prevalence of two palatal roots in maxillary second molar to be as low as 1.12%.^[1]

Of the two palatal roots, one is the normal one and the other is the supernumerary root which can be located either distolingually (radix distolingualis) or mesiolingually (radix mesiolingualis).^[6]

Peikoff et al. described six possible canal and root variations in the maxillary molars as following types: (i) three separate roots with three separate

canals; (ii) three separate roots with four canals in which two are in the mesiobuccal root; (iii) three roots and canals in which the Mesiobuccal and distobuccal canals join to form a common buccal; (iv) two independent roots with single canal in each root; (v) only one root with one canal in it (vi) four separate roots and four separate canals.^[7]

Also, Christie et al. classified four rooted maxillary second molars depending on root separation level and divergence as following types: (i) two widely placed palatal roots that are long and complex. Their buccal roots are often short and convergent. (ii) Four short, parallel, distinct roots. (iii) A web of root dentin engaging the mesiobuccal, mesiopalatal, and distopalatal root canal.^[8]

However, presently such an anomaly with four separate roots including two palatal roots has been reported with an incidence ranging from 1.47- 2.1%.^[4] But, such aberrancy is difficult to diagnose due to the tooth's posterior location and even superimposition of the anatomical structures on radiographs.^[3]

Sometimes, a palatogingival groove present may indicate the presence of two palatal roots. However, the most definitive means is by viewing the dentinal map pattern of the pulp chamber floor, which can be achieved by

proper access cavity design, magnification and illumination.^[3] Other methods include- taking more than two radiographs in different angulations, three dimensional radiographs, digital imaging like cone beam computed tomography scans.^[9]

In this case reported, the root and canal morphology according to Peikoff et al. was type-VI and according to Christie et al was type-I and was of unilateral occurrence in this patient.

CONCLUSION:

Therefore, the clinician should be careful in examining and diagnosing endodontic cases, so, that the correct treatment planning and treatment procedure can be executed. Therefore, the knowledge of the possible variations that can exist in individual teeth, precise radiographic examination, use of adjuvant diagnostic aids like dental operating microscopes, cone beam computed tomography or dye penetration methods; along with execution of endodontic treatment principles in a correct method will ensure higher practice standards and success.

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FIGURES:



Figure 1: Preoperative intraoral periapical radiograph showing maxillary left second molar with an extra palatal root



Figure 2: Immediate Post Obturation radiograph