

Three-Rooted Maxillary First Premolars: Five Clinical Cases

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Summary

Three-rooted maxillary first premolars do not occur usually, but their possibility always has to be considered. The buccal orifices of the root canals are not clearly visible. In spite of a good knowledge of tooth anatomy, clinical experience, and X-rays, the third canal is often overlooked. The incidence of maxillary first premolars with three roots, three canals and three foramina is about 4-6%. In this article 5 clinical endodontic cases of first maxillary premolars with three canals are presented. The first case presents endodontic treatment of the first right maxillary premolar for a prosthetic reason. All three canals were recognized and treated as documented by radiographs. The remaining cases were retreatment of the first maxillary premolars where third canals had remained unrecognized during previous endodontic procedures, resulting in failure of treatment. Retreatments were performed and results documented by radiographs.

Key words: *endodontic treatment, three-rooted first maxillary premolars.*

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Introduction

The most common root canal configuration of three-canalled maxillary premolars is three separate roots, each containing a single canal, resembling configuration of a miniature three-rooted maxillary molar (1) (Figure 1). The incidence of maxillary first premolars with three roots, three canals and three foramina is about 4-6% (2-4).

Other configuration possibilities of three-canalled upper first premolars, found very rarely, are three canals in a single root, or two canals in the buccal root and one in the palatal (2). Three-rooted first upper premolars are found more often in persons with Turner's syndrome (5, 6).

Due to the fact that visualisation of three-canalled maxillary premolars on operative radiographs can be difficult and buccal orifices are not clearly visible with a mouth mirror, one of the buccal canals often remains unrecognized and endodontically untreated.

The aim of this article was to present 5 clinical cases of the first upper three-canalled premolars with three separate roots.

Case reports I-V

The first case was an initial endodontic treatment of the first upper right premolar for prosthetic rea-

sons. In spite of a deep separation of buccal roots, all three canals were immediately recognized and treated (Figure 2a, 2b).

Cases II-V were endodontic retreatments of first maxillary premolars where third canals remained unrecognized during previous endodontic procedures. After some time chronic periapical periodontitis developed, and patients were sent to the Department of Endodontics, School of Dental Medicine University of Zagreb for endodontic retreatment. Retreatments were performed and results documented by radiographs (Figure 3a,b, Figure 4a,b, Figure 5a,b, Figure 6a,b).

All canals were instrumented by the step-back technique (7). Root canals were irrigated by 20 millilitres of 2.5% solution of sodium hypochlorite per canal. Canals were obturated with gutapercha cones (KERR, Scafati, Italy) and Diaket paste (ESPE, Seefeld, Germany) using cold lateral condensation filling technique (8).

Discussion

The pulp chamber of first upper premolars with three separate roots and canals can continue in the root canal space in two ways. First, three canals can originate separately from the chamber, one in each root. To allow good access for successful clinical

treatment, access cavity modification into a "T" shape is suggested (1), which means mesial-distal extending to the buccal area of the usual access cavity. This root morphology was found in teeth from clinical cases II-V presented in this article.

Secondly, two canals can originate from the pulp chamber, one in the palatal root and one in the buccal root. At a deeper level the buccal root with existing canal may divide into two gracile roots, each containing one narrow canal. This configuration restricts access to buccal canals and produces an "S" shaped canal, which can be eliminated by extending a trough apically 1 to 2 mm in depth, over and between the buccal canals (1). One should be careful not to over-enlarge the narrow buccal canals to prevent lateral strip perforation (1). This root morphology was found in the right first maxillary premolar presented in clinical case I.

Conclusion

Three-rooted maxillary first premolars do not usually occur, although they always have to be considered. Fundamental examination by X ray and proper access cavity preparation modified in "T trough" extension are prerequisites for successful endodontic treatment of three-canalled maxillary first premolars with separate roots.