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Complex root anatomy of upper molar with presence of three mesiobuccal canals

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Abstract

The mesiobuccal root of the upper molars usually presents anatomical complexities that limit the correct cleaning and shaping. This results in treatments with a high incidence of failure, which is why knowledge of the internal anatomy is essential.

The presence of three main canals in the mesiobuccal root of maxillary molars is infrequent, which can make root canal treatment difficult. A clinical case of a maxillary left first molar with three mesiobuccal canals is presented here.

Keywords: Upper first molars, MB1, MB2, MB3, Main canals, optical microscope

1. Introduction

The maxillary first molars have been widely studied as they often represent a challenge due to their complex internal anatomy, especially in the mesiobuccal root which generally presents a second main canal (MB2) which is usually omitted by clinicians and gives way to a incorrect cleaning of the root canal system [7, 8]. Recent studies of the internal morphology of upper molars using microcomputed tomography have shown the presence of fine anatomical structures such as intracanal communications, isthmuses, ramifications, and in low incidence the presence of a third main canal (MB3). (MB3) [1]. (Fig.1)

Clinical case

A 32-year-old male patient comes asymptomatic to the Endodontics clinic of the Autonomous University of Coahuila, Torreón, referring dental intervention with a month of evolution due to intense pain, which is why an emergency treatment was performed. in a private clinic where there was no Endodontics service. Clinical and radiographic inspection revealed an upper left first molar with good dental structure and the presence of a provisional restoration (Provisit ®) that invaded the pulp chamber (Fig. 2).

Based on the classification of pulpal and periapical pathology of the American Association of Endodontics (AAE), the diagnosis is suggested as "previously started" [6] and it is considered to have a good prognosis to return the tooth to its function.

Using an optical microscope, the rectification of access to the pulp chamber and location of two main canals is performed, where an isthmus is observed on the floor of the pulp chamber between the first main mesiobuccal canal (MB1) and MB2. (Fig. 3)

Selective attrition is performed using ultrasound (tip E7D) finding a third main canal which is between MB1 and MB2 (Fig. 4).

The initial patency of the canals was carried out with #10 K files, obtaining the working length with the help of the Propex Pixi ® apical locator, observing the trajectory of the buccal canals on the radiograph, which presented pronounced curvatures (Fig. 5). The buccal roots were instrumented with TruNatomy ® (Prime) files (Fig. 6), which offer high resistance to cyclic fatigue and torsion, in addition to being conservative in the wear of the cervical third [9, 10].

The palatal root, being broader, was instrumented with WaveOne Gold® (medium) and irrigated with 5.25% sodium hypochlorite (NaOCl); The filling was carried out with the

hydraulic condensation technique using TruNatomy Conform Fit® gutta-percha, Bio-C Sealer® bioceramic cement and reconstructed with ParaCore® (Fig. 7, 8).

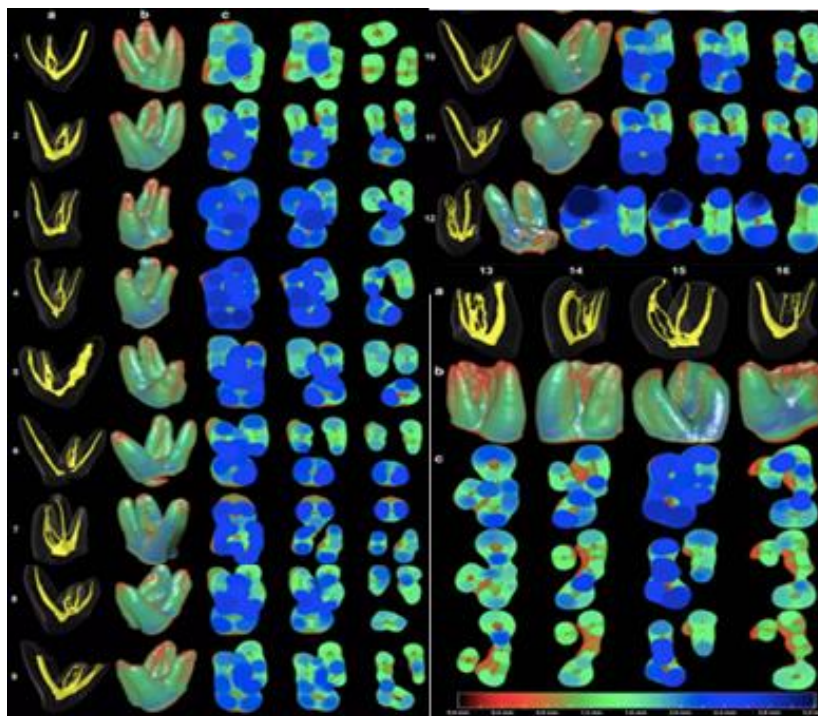


Fig 1: Results obtained in the study by Ordinola Zapata et al. of the analysis of the root canals of 16 MB roots of upper first and second molars that present MB3 canal [1].



Fig 2: Initial X-ray.

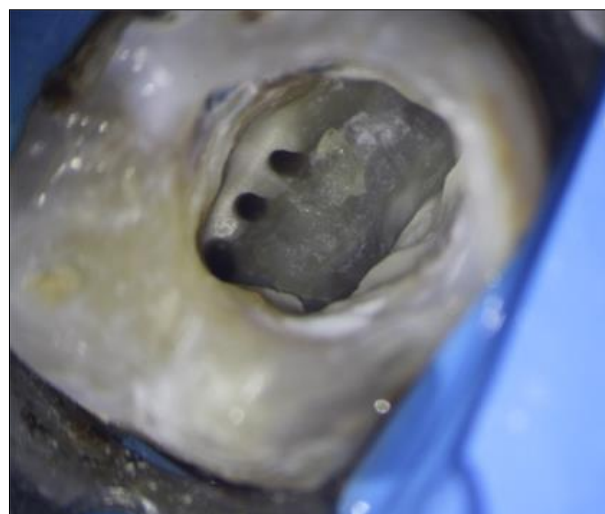


Fig 4: Presence of 3 main canals in the mesiobuccal root.

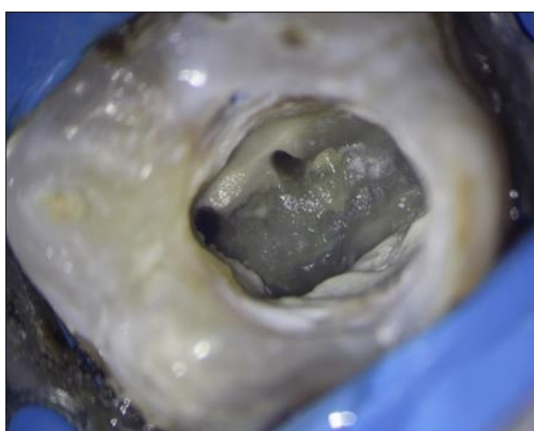


Fig 3: Access rectification, location of duct MB1 and MB2. A small isthmus is observed between the 2 ducts with the help of an optical microscope.



Fig 5: Radiographic conductometrics. Path of dilacerated ducts.

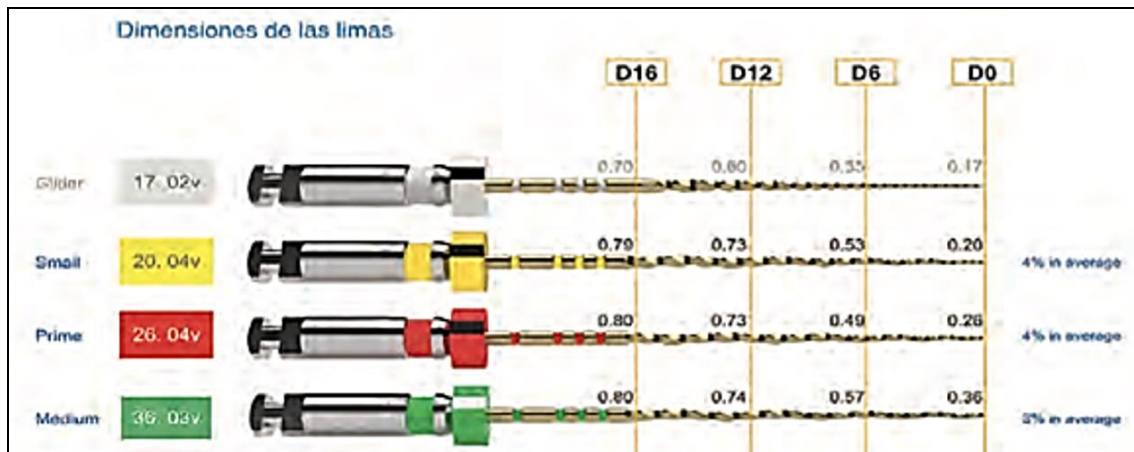


Fig 6: TruNatomy System



Fig 7: Root canal filling with Bio-C Sealer and TruNatomy Conform Fit gutta-percha.



Fig 8: Final X-ray.

Discussion

The main cause of endodontic failure in upper first molars is attributed to the lack of location of additional canals, which is associated with the presence of apical periodontitis^[4]. The incidence of two mesiobuccal canals in maxillary molars ranges from 48.0% to 97.6% between regions, with a worldwide prevalence of 73.8%^[2]. The use of diagnostic aids such as cone beam computed tomography (CBCT) and technological equipment such as microscope and ultrasound

have helped to greatly increase the location of canals^[8]. It has been reported that the prevalence of a MB3 canal is between 0.1% and 11.3% and its surrounding dentin thickness is less compared to that of MB1 and MB2, having an average distance of 1cm from the canal to the furcation, which means that shaping must be done with conservative instruments.^{(1) (3)} Recent studies using micro-CT demonstrate the high variability of root configuration of the MB root; The presence of independent orifices in the floor of the pulp chamber and the confluent anatomy of the MB3 canal are common anatomical features^[5].

Conclusions

- Knowledge of anatomical variations in the root canal plays an important role in the outcome of endodontic treatment.
- The cleaning, shaping and filling of all the root canals increases the success of the endodontic treatment, preventing later periapical pathologies.
- The use of magnification, ultrasound and the choice of suitable shaping systems have a considerable influence on root canal treatment.

Conflict of Interest

Not available

Financial Support

Not available

References

1. Ordinola-Zapata R, Martins JNR, Plascencia H, Versiani MA, Bramante CM. The MB3 canal in maxillary molars: a micro-CT study. *Clin Oral Investig.* 2020 Nov;24(11):4109-4121.
2. Martins JNR, Alkhawas MAM, Altaki Z, Bellardini G, Berti L, Boveda C, Chanotis A, Flynn D, Gonzalez JA, Kottoor J, Marques MS, Monroe A, Ounsi HF, Parashos P, Plotino G, Ragnarsson MF, Aguilar RR, Santiago F, Seedat HC, Vargas W, von Zuben M, Zhang Y, Gu Y, Ginjeira A. Worldwide Analyses of Maxillary First Molar Second Mesiobuccal Prevalence: A Multicenter Cone-beam Computed Tomographic Study. *J Endod.* 2018 Nov;44(11):1641-1649.e1.
3. Gundam S, Maddu R, Gurram SR. Endodontic management of a maxillary molar with three mesiobuccal canals. *Case Rep Dent.* 2014, 320196.
4. Ahmad IA, Al-Jadaa A. Three root canals in the mesiobuccal root of maxillary molars: case reports and

- literature review. *J Endod.* 2014 Dec;40(12):2087-94.
5. Kim Y, Chang SW, Lee JK, Chen IP, Kaufman B, Jiang J, *et al.* A micro-computed tomography study of canal configuration of multiple-canal mesiobuccal root of maxillary first molar. *Clin Oral Investig.* 2013 Jul;17(6):1541-6.
 6. AAE Consensus Conference Recommended Diagnostic Terminology. *Journal of Endodontics.* Vol 35, # 12. 2009, 1634.
 7. Coelho MS, Lacerda M, Silva M, Rios MA. Locating the second mesiobuccal canal in maxillary molars: challenges and solutions. *Clinical, cosmetic and investigational dentistry.* 2018;10:195–202.
 8. Studebaker B, Hollender L, Mancl L, Johnson JD, Paranjpe A. The Incidence of Second Mesiobuccal Canals Located in Maxillary Molars with the Aid of Cone-beam Computed Tomography. *Journal of endodontics.* 2018;44(4):565-570.
 9. Elnaghy AM, Elsaka SE, Mandorah AO. *In vitro* comparison of cyclic fatigue resistance of TruNatomy in single and double curvature canals compared with different nickel-titanium rotary instruments. *BMC Oral Health.* 2020;20(1).
 10. TruNatomy Brochure, Dentsply Sirona Endodontics.

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