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Original Article

Assessment of presence of middle mesial canal in mandibular molars in a tertiary hospital using CBCT: A cross sectional study

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ABSTRACT:

Introduction: For the successful endodontics all the presentations of the root canals have to be well understood. Hence in this study we aim to assess the presence of the middle mesial canal mandibular molars in a tertiary hospital by CBCT. **Materials and Methods:** We considered 100 subjects whose CBCT images were collected at the institutional department of endodontics. The shape and presence of MMC, canals and number of roots, were evaluated in mandibular molars with no previous restorations or therapies. Thus collected data was analyzed keeping $p < 0.05$ as significant. **Results:** Out of 254 teeth assessed middle mesial canals found in 30 teeth with an overall prevalence of 10 percent with significantly higher prevalence in first molar than second molar. There was no statistical correlation between the existence of MMCs and demographics. **Conclusion:** we can conclude that, the total prevalence of MMC was 10%. And mostly seen in the first mandibular molar.

Key Word: Middle Mesial Canal, Cone Beam Computed Tomography, Mandibular Molar.

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INTRODUCTION

The mandibular molars are the most important teeth in the mouth and also the most common root canal treated. Various presentations of the canals are also reported in the literature.^[1-3] For successful root canal therapy the thorough knowledge of the anatomies and

the presentations is to be known.^[4]

The missed canals may lead to failures in the endodontics. Middle Mesial Canal (MMC) is usually reported in the studies.^[5-7] Failure to detect the presence of an MMC during endodontic treatment of mandibular molar teeth could lead in bacterial

biofilms in the canal, causing periapical inflammation to deterioration and treatment failure.^[9]

Root canal morphology has been investigated with a selection of methodologies, each with its own set of rewards and drawbacks. Plastic casts, staining and cleaning,^[1] micro-computed tomographic imaging,^[2-4] and an operational microscope were all used in in vitro experiments.^[5] CBCT has the advantage over other procedures in that it displays healthy teeth in real time.

It's vital to understand the prevalence and distribution of middle mesial canal (MMC) in mandibular molar teeth in various groups, which can range from 26 %^[6] to 53.8 %.^[7] A number of studies have found that racial and ethnic characteristics may play a role in molar tooth root canal shape and morphology, leading these anatomical abnormalities to occur at various rates in people all over the world.^[8] Hence in this study we aim to assess the presence of the middle mesial canal mandibular molars in a tertiary hospital by CBCT.

MATERIAL AND METHODS

We selected 100 subjects, attending the department of endodontics at our institution. The consent from the patient was taken, and the institutional ethics clearance was also taken. The

CBCT images of these patients were selected from both the sides of the mandibles. The presence of the MMC was noted. Both the first and the second molars were considered for the study. The subjects were noted for the demographics. All images analyzed simultaneously to obtain a consensus between two examiners. All the teeth with the previous restorations, any anomalies, root fractures, etc were excluded.

After data collected was entered on data entered in excel work sheet and data analysis was performed with the help of statistical significance level keeping below 5% (P < 0.05).

RESULTS

We observed the following among the 100 subjects and their CBCT. Almost similar distribution of the age and the gender was seen with no significant difference between the genders. Out of 254 teeth assessed middle mesial canals found in 30 teeth with an overall prevalence of 10 percent with significantly higher prevalence in first molar than second molar. There was no statistical correlation between the existence of MMCs and demographics. **Table 1.** The Distribution (%) of MMC Based on Two Distal Canal is presented in **table 2.**

Table 1: Relation of MMC to Demographic Factors

Molar type	First molar	Second molar	Total	P value
	22	9	10.0%	<.05
side	Right	left		P value
	12	12	24	>.05
Gender	Male	Female		P value
	18	11	30	>.05
Age	<20	20-40	>40 years	P value
	10(3.1%)	11(3.4%)	8(2.5%)	>.05

Table 2: Relation of MMC to second distal canal

The Frequency Distribution (%) of MMC Based on Two Distal Canal		
Two distal canal, n (%)		
	With	without
With MMC	14	15
Without MMC	26	269
Total	40	284

DISCUSSION

The morphology and internal anatomy of many types of teeth differs depending on ethnicity and race. This explains why different types of middle mesial canal architecture and prevalence occur at varying rates in different groups.^[8] In this research, the incidence of MM canals was at the lower end (10%), compared to the reported range in the international literature (0.26% to 53.8%). Tahmasbi et al^[9] conducted a CBCT study to find the prevalence of MMC in 122 teeth using the voxel size of 76µm they found a prevalence of 16.4% which is comparatively more compared to present study may be due to different in size of voxel in addition to difference in ethnicity and

race. The present study found significant number of MMC in first molars than second molars that is consistent with previous study.^[9] There was no difference in MMC distribution between first and second molars in a few trials.^[8,10] Other investigations revealed a higher frequency in second molar , although the findings were not statistically significant.^[7] The current study found no significant differences based on age, which is consistent with previous research. In other studies, MMC was found to be more common in younger patients than in older people .In several research, sex, in addition to molar type and age, appears to be a significant determinant. Inaty et al^[10] found out that there is a significant

difference between women (11.2%) and men (18.4%) (P value <0.05). In one study they found that more prevalence in females than males. The present study shows no significant variation in males and females that is consistent with most of the previous studies.^[8,9] Side of the mandible does not appear to be significant factor in the present study. Prevalence of MMC was more in teeth having second distal canal in the present study (Table 2) Detection difficulties due to small orifice diameter and orifice hidden by developmental groove, as well as complications due to the canal root to main canal, are trials faced by clinicians while the management of teeth with MMC. Access modification, ultrasonic troughing, magnification, troughing under magnification, and CBCT are all used in the clinical detection of these canals. Various studies report varying rates of detection with various methods, and the use of CBCT should be limited due to the radiation risk. The current study's limitations were that it was a single-center study with low-resolution images.

CONCLUSIONS

Prevalence of the middle mesial canals was lower (10%) and is at the lower end of the described range in the international literature, which ranges from 0.26 percent to 53.8 percent. There is no statistically significant difference in age groups, gender, or mandibular side. MMC was more seen in first molars than second molars, and teeth with a second distal canal were more common than teeth with a single canal. Careful exploration of the region between canal orifices is necessary in order to prevent missing the MMC and consequences.

REFERENCES

1. Gulabivala K, Aung T, Alavi A, Ng YL. Root and canal morphology of Burmese mandibular molars. *International endodontic journal*. 2001;34(5):359-70.
2. Villas-Bôas MH, Bernardineli N, Cavenago BC, Marciano M, del Carpio-Perochena A, De Moraes IG, et al. Micro-computed tomography study of the internal anatomy of mesial root canals of mandibular molars. *Journal of endodontics*. 2011;37(12):1682 -6.
3. Harris SP, Bowles WR, Fok A, McClanahan SB. An anatomic investigation of the mandibular first molar using micro-computed tomography. *Journal of endodontics*. 2013;39(11):1374-8.
4. Wolf TG, Paqué F, Zeller M, Willershausen B, Briseño-Marroquín B. Root canal morphology and configuration of 118 mandibular first molars by means of micro-computed tomography: an ex vivo study. *Journal of endodontics*. 2016;42(4):610-4.
5. Karapinar-Kazandag M, Basrani BR, Friedman S. The operating microscope enhances detection and negotiation of accessory mesial canals in mandibular molars. *Journal of Endodontics*. 2010;36(8):1289-94.
6. Kim SY, Kim BS, Woo J, Kim Y. Morphology of mandibular first molars analyzed by cone-beam computed tomography in a Korean population: variations in the number of roots and canals. *J Endod*. 2013;39(12):1516-21.
7. Chavda SM, Garg SA. Advanced methods for identification of middle mesial canal in mandibular molars: An in vitro study. *Endodontology*. 2016;28(2):92.
8. Nosrat A, Deschenes RJ, Tordik PA, Hicks ML, Fouad AF. Middle mesial canals in mandibular molars: incidence and related factors. *J Endod*. 2015;41(1):28-32.
9. Tahmasbi M, Jalali P, Nair MK, Barghan S, Nair UP. Prevalence of Middle Mesial Canals and Isthmi in the Mesial Root of Mandibular Molars: An In Vivo Cone-beam Computed Tomographic Study. *J Endod*. 2017;43(7):1080-3.
10. Inaty E, Jabre C, Haddad G, Nehme W, Khalil I, Naaman A, et al. Anatomical Investigation of Middle Mesial Canals of Mandibular Molars in a Middle Eastern Population: A Cross-sectional Cone-beam Computed Tomography Study. *J Contemp Dent Pract*. 2020;21(8):910-5.