

How to Cite:

Kumar, T. M., Nehrudhas, P., Megavarnan, R., Kurian, A. B., Shruthi, J., & Subashri, V. (2022). Middle mesial canal: Case series. *International Journal of Health Sciences*, 6(S1), 3238–3246. <https://doi.org/10.53730/ijhs.v6nS1.5132>

Middle Mesial Canal: Case Series

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Abstract---The occurrence, instrumentation, and obturation of the isthmus between the mesiobuccal and mesiolingual canals in mandibular first molars were studied. The morphology of these middle mesial canals was as follows: eight fins, two confluent canals, and two independent canals. Failures of root canal treatment are mainly due to missed canals and ignorance about the anatomy of the root canal system. The middle mesial (MM) canal is one such type of canal in mandibular molars which is often missed. This case series explain and illustrates three cases with middle mesial canals which is treated successfully.

Keywords---Middle mesial canal, obturation, molar.

Introduction

The primary objective of the root canal therapy is to obtain a hermetic seal of the root canal space. Missed space and canal may contain enormous amount of micro organisms and their by products which may contribute to the failure of the treatment¹. It has been shown that strong relationship between the untreated canal space and periodontitis. Witherspoon DE (2013) et al identified the incidence of additional or missed canal systems in molar retreatment cases and found that in the mandibular first molars, 86% of missed canals were identified in the distal and 14% were Identified in the mesial root. The mandibular first molar is the first posterior tooth that erupts and is the tooth most often requires root canal treatment. They normally present with two roots and two canal in the mesial root & one or two canal in the distal root (Figure 1). The purpose of this article is to report the successful treatment of an additional case of a mandibular molar with three mesial and two distal canals.

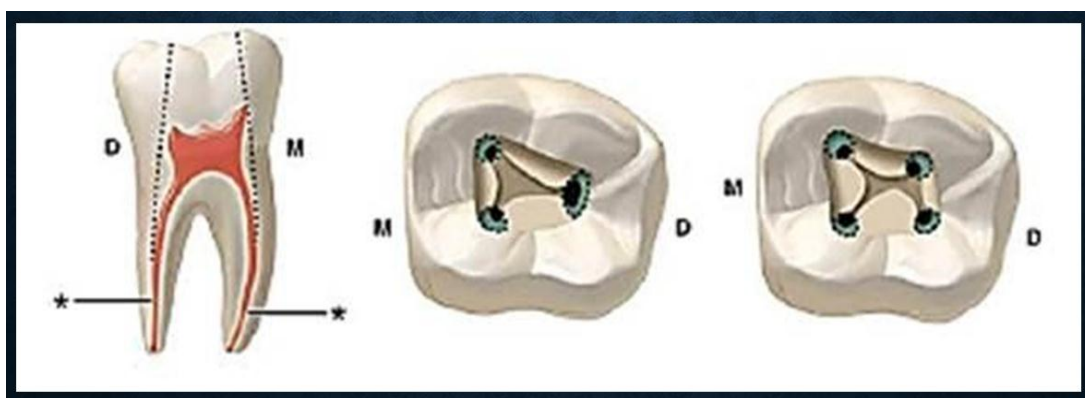


Figure 1-mandibular first molar root configurations

Most significant feature in the mandibular first molar is additional root canal in the mesial root is called middle mesial canal. Vertucci and Williams, who first reported the middle mesial canal in 1974.² Pomeranz HH et al in 1981 suggested clinical evaluation of 100 mandibular molar found that 12 molars had MM canals in the mesial roots and classified into three categories

Fin

If an instruments could pass freely between mesiobuccal or mesiolingual and middle mesial canal

Confluent

When separate orifice is present but the canal joins either MB or ML canal apically

Independent

The canal has separate orifice and terminate to separate foramen

The most common to be reported as confluent followed by Fin and Independent^{4,5}. De carvalho MC reported that MM canal most commonly joint with ML canal rather than MB canal⁶.

Case 1

30yr/Female

Chief complaint :

▫ Patient complains of broken restoration and pain in lower left back tooth region for past 1month

Past medical history:

No relevant medical history

Past dental history:

▫ History reveals that the pain is sharp, intermittent and aggravated on taking cold food.

Hard tissue examination:

▫ Secondary dental caries – 36

▫ Tenderness on percussion -36

Diagnosis :

▫ Symptomatic irreversible pulpitis with apical periodontitis in 36.

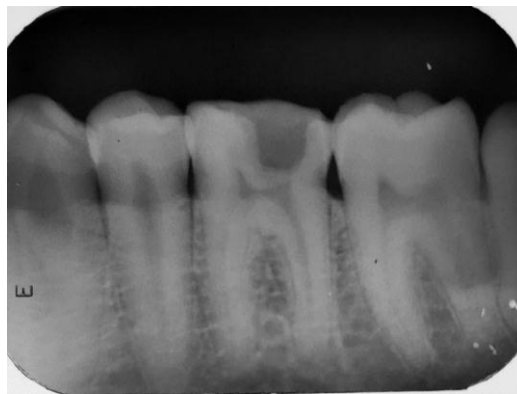


Figure 2- Pre operative radiograph

Procedures

1. LA was administered and access cavity was established.
2. Initially, 2 canals mesially and 2 canals distally were located which were a little apart
3. During refining of the access cavity, a small catch was found with DG-16 on the groove between MB and ML orifices
4. The catch was explored with a #10 K file.
5. Working length radiograph and confirmed to be confluent type
6. The canal orifices were enlarged using Sx orifice shaper



Figure 3-working length

Access Opening



Figure 3-Access opening

- Instrumentation of the canals was performed
- Canal irrigation was performed using 3% of NaOCl and the lubricant used was 17% EDTA
- The canals were then dried and fitted with corresponding gutta-percha and a mastercone radiograph was taken

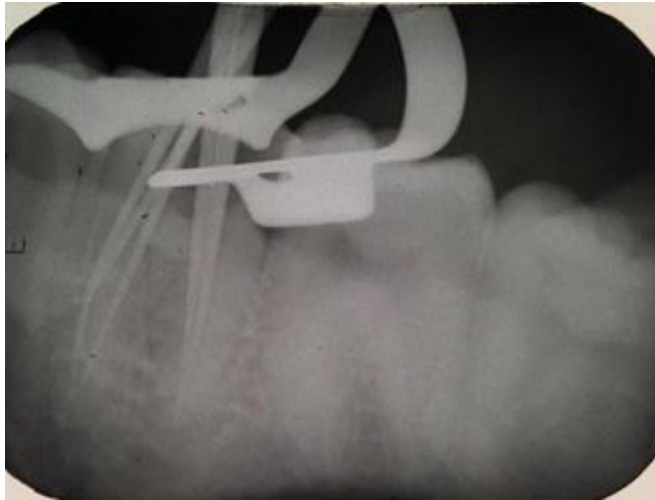


Figure 4 –master cone

Obturation

It was completed using AH plus resin sealer and Post obturation radiograph was taken.

ORTHODONTICS



Figure 5 –Obturation

Case series 2

27yr/Male

Chief complaint :

•Patient complains of pain in lower left back tooth region for past 1month

Past medical history:

•No relevant history

Past dental history:

◦ History reveals that the pain is sharp, intermittent and aggravated on taking cold food.

Diagnosis

Symptomatic irreversible pulpitis



FIGURE 6- Pre operative radiograph

1. LA was administered
2. isolated with rubber dam
3. access cavity prepared with endo access bur
4. canal orifice was located –MB ,ML,DB,DL
5. On careful examination and by running DG-16 in groove between the mesiobuccal and mesiolingual canal orifices
6. Middle mesial canal orifice was identified and enlarged using Sx orifice enlarger.



FIGURE 7 –WORKING LENGTH AND OBTURATION

Case series 3

32 yr/Male

Chief complaint :

▫Patient complains of pain in lower right back tooth region for past 2 month

Past medical history:

▫No relevant history

Past dental history:

▫ History reveals that the pain is sharp, intermittent and aggravated on taking cold food.

Intra oral examination

Large amalgam restoration in 46

Diagnosis

Symptomatic irreversible pulpitis in relation to 46

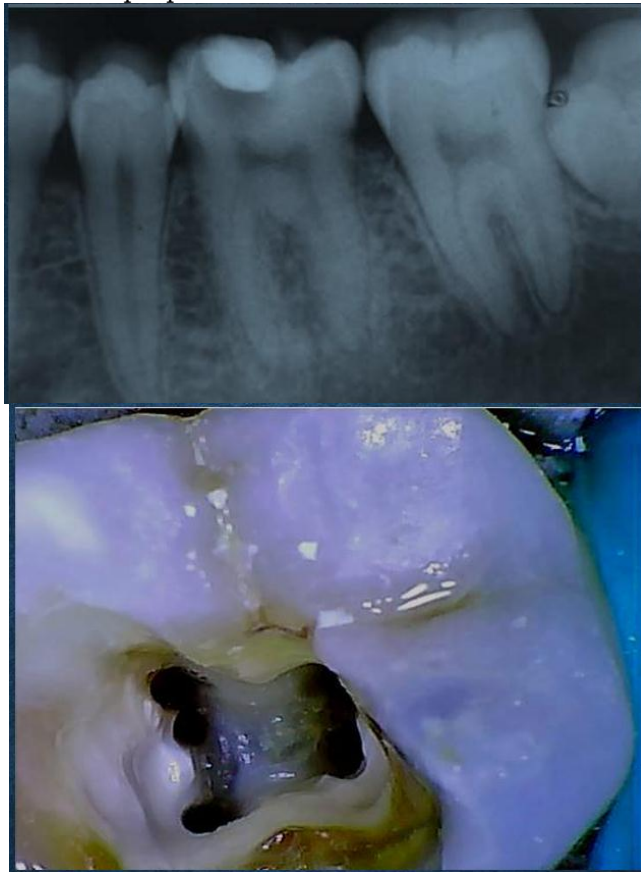




FIGURE 8-PRE OPERATIVE RADIOGRAPH,ACCESS OPENING,WORKING LENGTH DETERMINATION AND OBTURATION

Discussion

Many dental clinicians tend to perceive a given tooth will contain pre determined roots and root canals. many literature reveal that deviation from normal anatomy is not uncommon. AliNosrat et al suggested During the time frame, seventy-five mandibular first and second molars were treated. A total of fifteen teeth (20%) had MM canals that could be negotiated. MM canals were seen in 32.1 percent of patients under the age of 20, 23.8 percent of individuals 21–40 years old, and 3.8 percent of patients beyond 40 years old. The distribution of MM canals among different age groups was shown to be significantly varied after data analysis. In 1991, Goel et al identified a 15% incidence of MM in the Indian population, with just 6.7 percent having an independent configuration. (The separate configuration of the MB and MM canals is seen in case report-3 in reference to 46.) MehrnazTahmasbi et al studied and suggested that Twenty (16.4 percent) of the 122 teeth had genuine MM canals. MM canals were seen in 26 percent of first

molars and 8 percent of second molars (P.05). Isthmi was found in 64.7 percent of the mesial roots. Under the microscope, 258 first molars were examined, with 28.3% having negotiable MM canals.

MM canals were seen in 36.6 percent of patients aged 11 to 30, 22.6 percent of patients aged 31 to 50, and 18.4 percent of patients aged >50⁸. The physician should be aware of the incidence of these additional canals in the mandibular first molar since instrumentation is one of the most important elements in the effectiveness of endodontic therapy. The doctor can then conduct a thorough inspection of the pulp chamber to ensure that all canals have been completely debrided. This improves the chances of long-term endodontic therapy success

Conclusion

While treating further abnormal canals can be difficult, failures can occur if root canals are not found. The physician should be aware of the presence of a midmesial canal, and a comprehensive examination of the pulp chamber, combined with the use of diagnostic aids, can help discover overlooked canals, resulting in complete debridement and a higher probability of long-term success in endodontic therapy.

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