RESEARCH PAPER

Navigating The Obliterated: Endodontic Management Of Calcified Molars

Dr. Niranjan C Paramshetty,[1] Dr. Bhagyalaxmi Fouzdar,2 Dr. Payal Das*[3,] Dr. Vinay Guggari[4] Dr. Bhavana S[5]

[1]MD and Implantologist, KDC Xpress Teeth, RR Nagar, Bengaluru, Karnataka, India.
Email ID kdc.care@gmail.com, Orcid Id 0009-0004-7636-6786
[2]Director and Implantologist, KDC Xpress Teeth, RR Nagar, Bengaluru, Karnataka, India.
Email ID drbhagyalaxmi@gmail.com, Orcid Id 0009-0005-2940-584X
[3]Consultant Conservative Dentist and Endodontist , KDC Xpress Teeth, RR Nagar, Bengaluru, Karnataka, India, Email Id payaldas0195@gmail.com, Orcid Id 0009-0005-3669-6489
[4]Consultant Prosthodontist and Implantologist, KDC Xpress Teeth, RR Nagar, Bengaluru, Karnataka, India, Email Id drvinay.kdc@gmail.com, Orcid Id 0009-0008-5457-4575
[5]Consultant Endodontist, KDC Xpress Teeth, RR Nagar, Bengaluru, Karnataka, India, Email Id bhavana.s021@gmail.com

***Corresponding author:** Dr Payal Das
MDS (Consultant Conservative Dentist and Endodontist), KDC Xpress Teeth, RR Nagar (Bangalore), Email Id payaldas0195@gmail.com, Mobile - 8105326337, Orchid Id - 0009-0005-3669-6489

ABSTRACT
Pulp canal calcification presents a significant challenge in endodontic therapy, often complicating canal location, negotiation, and instrumentation. These case reports describe the successful management of a calcified root canal in molars using a combination of advanced diagnostic and clinical techniques. Two old patients presented with symptomatic irreversible pulpitis associated with a heavily calcified canal. Preoperative radiographic assessment, supplemented by cone-beam computed tomography (CBCT), aided in identifying the extent and location of calcification. Careful access cavity preparation under magnification facilitated the identification of the obliterated canal orifice. Sequential filing and copious irrigation followed by a 3-dimensional obturation resulted in the successful completion of the endodontic therapy.

KEYWORDS: Calcified canals, endodontic management, molar, pulp canal obliteration, D finders

How to cite this article: Paramshetty NC, Fouzdar B, Das P, Guggari V, Bhavana S. Navigating The Obliterated: Endodontic Management Of Calcified Molars. Int J Drug Deliv Technol. 2026;16(36s): 164-167. DOI: 10.25258/ijddt.16.36s.18

INTRODUCTION

Pulp canal calcification is a common sequela of aging, dental trauma, caries, and restorative procedures, characterized by the deposition of hard tissue within the root canal space. This process may lead to partial or complete obliteration of the canal, posing a significant challenge to endodontic diagnosis and treatment.[1] Clinically, calcified canals are often associated with discoloration of the crown and may present with symptoms ranging from asymptomatic conditions to pulpal or periapical pathosis.[1]

The management of calcified canals requires a high level of clinical skill and careful treatment planning, as the difficulty in locating and negotiating the canal increases the risk of procedural errors such as perforation, excessive dentin removal, or instrument separation. Conventional radiographic techniques may be insufficient to accurately determine the extent and orientation of calcification due to their two-dimensional limitations.[2] Therefore, adjunctive tools such as cone-beam computed tomography (CBCT) have become valuable in providing three-dimensional assessment of canal anatomy.[3]

Recent advancements in endodontics like the use of magnification, ultrasonic instruments, and specialized micro-openers, have significantly improved the clinician's ability to manage calcified canals. The use of chelating agents and pre-curved stainless steel files further aids in negotiating these challenging canal systems while preserving tooth structure.[4]

These case reports aim to describe the successful management of a calcified root canal using a combination of advanced imaging, magnification, and minimally invasive techniques, emphasizing the importance of a systematic approach to achieve predictable outcomes in such complex cases.

CASE REPORT

Case presentation 1

A 62-year-old female patient reported to the clinic with a chief complaint of severe pain in the upper left back tooth region for 2 weeks. Before reporting to this clinic she went to another private clinic, where they attempted access opening irt 26 but couldn't negotiate the canals.

Clinical examination revealed attempted access opening in the maxillary left first molar, which was tender on percussion. No swelling or sinus tract was observed. Radiographic examination showed evidence of severely obliterated canals and widening of the periodontal ligament space. Based on clinical and radiographic findings, a diagnosis of symptomatic irreversible

*Author for Correspondence: payaldas0195@gmail.com

pulpitis with symptomatic apical periodontitis irt 26 was made.

Treatment Procedure

After obtaining informed consent, non-surgical root canal treatment was initiated.

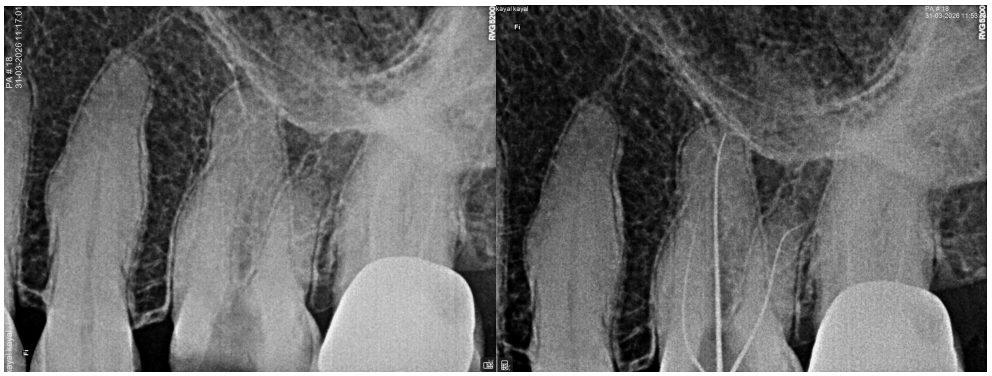
Anaesthesia was achieved using 2% lignocaine hydrochloride with 1:80,000 adrenaline. Access cavity preparation attempted previously was assessed; however, canal orifices were not clearly visible due to calcification.

A dental magnifying loupe was used to enhance visualization. Ultrasonic tips were employed to trough the pulpal floor and locate canal orifices. A DG-16 explorer assisted in identifying the canal entries.Negotiation of the canals was initiated using D finders and #6, #8, and #10 K-files along with a chelating agent (17% ethylene diamine tetra acetic acid (EDTA)). A watch-winding motion was used to gently advance the files.

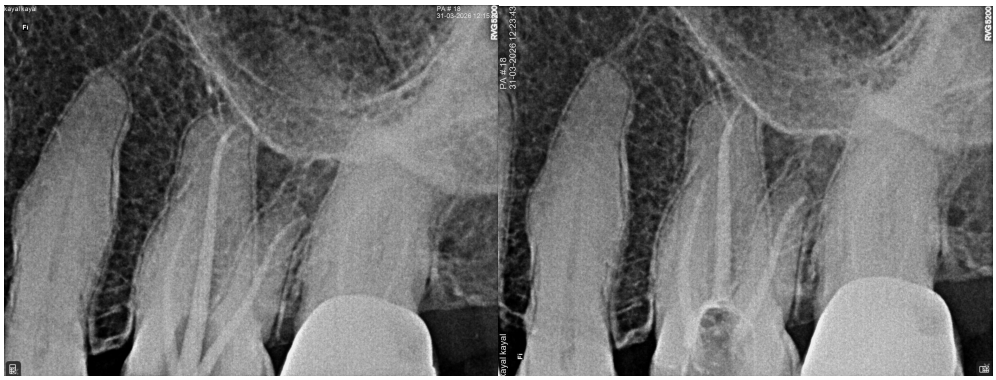
Working length was determined using an electronic apex locator and confirmed radiographically.

Cleaning and shaping were performed using rotary nickel-titanium instruments with copious irrigation using 3% sodium hypochlorite, normal saline and 17% EDTA. Canal patency was maintained throughout the procedure.

The canals were dried with sterile paper points and obturated using 20/06 gutta-percha and bioceramic sealer.A temporary restoration was placed, and the patient was advised for full coverage crown.



Pre-op (attempted access opening) Working length determination

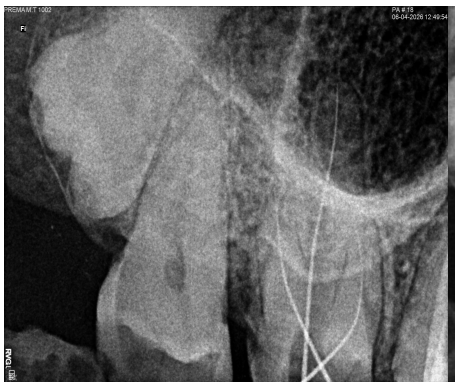


Master cone Obturation

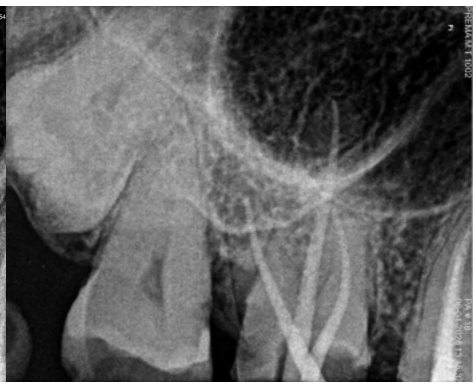
Case presentation 2

A 54-year-old male patient reported to the clinic with a chief complaint of pain in the upper right back tooth region since 1 month. Clinical examination revealed deep dentinal caries in 16, which was tender on percussion without swelling or sinus tract. Radiographic examination revealed reduced pulp chamber space, evidence of severely obliterated canals and widened periodontal ligament space. Based on clinical and radiographic findings, a diagnosis of symptomatic irreversible pulpitis with symptomatic apical periodontitis irt 16 was made.

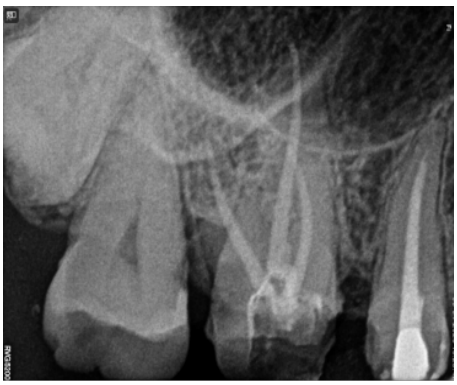
Treatment was performed following the same protocol as case 1, achieving successful negotiation, cleaning, shaping and obturation of the calcified canals.



Working length determination



Master cone



Obturation

DISCUSSION

Pulp canal calcification is a common finding in elderly patients and is often associated with aging, long-standing irritation, or restorative procedures.[1] Progressive deposition of secondary and tertiary dentin leads to narrowing or complete obliteration of the pulp space, posing significant challenges during endodontic treatment.[2]

In the present cases, the patient's age (62 years in the first and 54 in the second case) were important contributing factors for canal calcification. Maxillary first molars are known for their complex root canal anatomy, and the presence of calcification further complicates the location and negotiation of canals.[4] Failure to identify and treat all canals may result in persistent infection and treatment failure.[5]

The use of magnification has been shown to significantly improve the detection of calcified canal orifices. In this case, magnification enabled better visualization of the pulpal floor anatomy and aided in precise troughing.[6] Ultrasonic tips facilitated conservative dentin removal and minimized the risk of perforation compared to conventional burs.[7]

Negotiation of calcified canals requires patience and the use of small-sized hand files. In the presented cases, first a D finder was used which is known to have an active tip resulting in provision of the initial feeling of catch while searching for the canals.[8] Sequentially #6, #8, and #10 K-files, along with a chelating agent such as EDTA, were effective in establishing a glide path.[9] The watch-winding motion and gentle tactile control are critical to prevent procedural errors such as ledge formation or instrument separation.[10]

Working length determination using an electronic apex locator, in conjunction with radiographic confirmation, improved accuracy, especially in narrow and indistinct canals.[11] Cleaning and shaping were performed cautiously using rotary nickel-titanium instruments after establishing a reproducible glide path.[12] Copious irrigation with sodium hypochlorite, normal saline and EDTA played a vital role in disinfection, particularly where mechanical instrumentation was limited.[13]

In calcified canals, excessive enlargement is not recommended due to the increased risk of perforation and weakening of root structure.[14] In the presented cases, preparation was limited to an appropriate apical size that ensured adequate debridement while preserving dentin integrity.

Obturation of calcified canals can be challenging due to irregular canal morphology.[15] However, proper canal preparation and the use of matched gutta-percha cones allowed satisfactory obturation. A good apical seal is essential to prevent reinfection and promote periapical healing.[16] The favorable outcome observed in this case highlights the importance of a meticulous approach, use of advanced armamentarium, and adherence to endodontic principles. Early detection, careful planning, and clinician experience play a crucial role in the successful management of calcified canals.[17]

CONCLUSION

Above cases demonstrate that with meticulous technique and appropriate armamentarium, even severely calcified canals in elderly patients can be successfully treated, resulting in favorable clinical and radiographic outcomes.

REFERENCES

1. Giri K, Banga K, Arora S, Elmsmari F, Pawar AM. Management of calcified canals during root canal treatment: a systematic review of case reports. PeerJ. 2025;13:e19900. doi:10.7717/peerj.19900.
2. Chaniotis A, Dias HS, Chanioti A. Negotiation of calcified canals. J Clin Med. 2024;13(9):2703. doi:10.3390/jcm13092703.
3. Floratos S, Miltiadous ME. Intraoperative use of CBCT for identification and localization of calcified canals: a clinical technique. Case Rep Dent. 2017;2017:1265701. doi:10.1155/2017/1265701.
4. Khatod S, Ikhar A, Nikhade P, Jaiswal A. Management of calcified root canal: A case report. Indian Journal of Forensic Medicine & Toxicology. 2020 Oct 29;14(4):6705-8.
5. Heptania M, Farahanny W, Abidin T. Endodontic challenges in the management of multiple pulp stones and root Canal Calcification-A case report. J Evol Med Dent Sci. 2022;11(7):712.
6. Tavares WLF, Ferreira MVL, De Carvalho Machado V, Braga T, Amaral RR, Cohen S. Guided endodontic access of calcified anterior teeth. J Endod. 2018;44(7):1195–1199. doi:10.1016/j.joen.2018.04.014.
7. Sinha N, Kamboj A, Chopra S, Rathod A, Mohanty P, Mathur P. Endodontic management of pulp canal obliteration: a case report of two cases. Int J Maxillofac Imaging. 2022;8(1):13–15.
8. Oginni AO, Adekoya-Sofowora CA, Kolawole KA. Evaluation of radiographs, clinical signs and symptoms associated with pulp canal obliteration: an aid to treatment decision. Dent Traumatol. 2009;25(6):620–625.
9. Stroner WF, Van Cura JE. Pulpal dystrophic calcification. J Endod. 1984;10(5):202–204.
10. Jimmy E, Rao NG. Strategies for management of calcified canals in endodontics: a review. Endodontology. 2018;30(1):3–10. (Review article)
11. Ahmad IA, Al Omari MA, Dummer PMH. Pulp canal obliteration and calcification: clinical and radiographic terms. Int Endod J. 2012;45(8):711–726.
12. Michetti J, Maret D, Mallet JP, Diemer F. Use of cone-beam computed tomography (CBCT) to locate calcified canals. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2010;109(5):e41–e46.
13. Jha AK, Jha RK. A review on negotiating calcified canals. Dent Res J (Isfahan). 2016;13(5):389–395.
14. Patel S, Dawood A, Ford TP, Whaites E. The potential applications of cone beam CT in the management of endodontic problems. Int Endod J. 2007;40(10):818–830.
15. Weller RN, Brady JM, Baumgartner JC, Guo Y. Effect of EDTA and ultrasonic on calcified canals in extracted human teeth. J Endod. 2014;40(5):613–616.
16. Plotino G, Grande NM, Mercadé M, et al. Ultrasonic tips for ultraconservative access cavity preparation in management of calcified canals: a clinical study. J Endod. 2014;40(3):424–428.
17. Peters OA. Current challenges and concepts in the preparation of root canal systems: a review. J Endod. 2004;30(8):559–567.