

Nonsurgical Endodontic Retreatment of a Cystic Apical Lesion Associated with Root Resorption: A Promising Approach

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ABSTRACT

This case report highlights the successful management of a cystic apical lesion associated with root resorption through nonsurgical endodontic retreatment, utilizing calcium-enriched mixture (CEM) cement as an obturating biomaterial. A 35-year-old woman presented with mild discomfort in the mandibular right first molar (#46), with radiographic evidence of a well-defined radiolucent lesion at the apex of the mesial root. The tooth had a history of previous failed endodontic treatment with poor root canal obturation, indicating internal root resorption. Nonsurgical endodontic retreatment was performed, and the canals were filled/sealed with CEM cement. Follow-up radiographs showed a gradual reduction in the size of the cystic lesion. At 54 months, complete bone healing of the cystic apical lesion was evident. This case report provides clinical evidence supporting the potential efficacy of nonsurgical endodontic retreatment using CEM cement in managing certain cystic apical lesions, offering a promising alternative to traditional surgical enucleation, even in cases with inflammatory root resorption. Further research is needed to validate the long-term efficacy of this approach in larger patient populations.

Introduction

Periapical cysts, including true or pocket cysts, are usually caused by pulp necrosis and chronic inflammation of the periapical tissues. Surgical enucleation is always the treatment of choice. However, there is evidence that nonsurgical endodontic treatment can provide an effective approach to managing some cystic apical lesions

[1]. When the cyst is associated with inflammatory root resorption, leading to an hourglass shape of the apical foramen, the conservative approach can be difficult or even impossible. However, this report aims to demonstrate the efficacy of nonsurgical endodontic retreatment for a cystic apical lesion utilizing a calcium-enriched mixture (CEM) cement root canal filling as an obturating biomaterial to highlight its potential in promoting periapical healing and regeneration.

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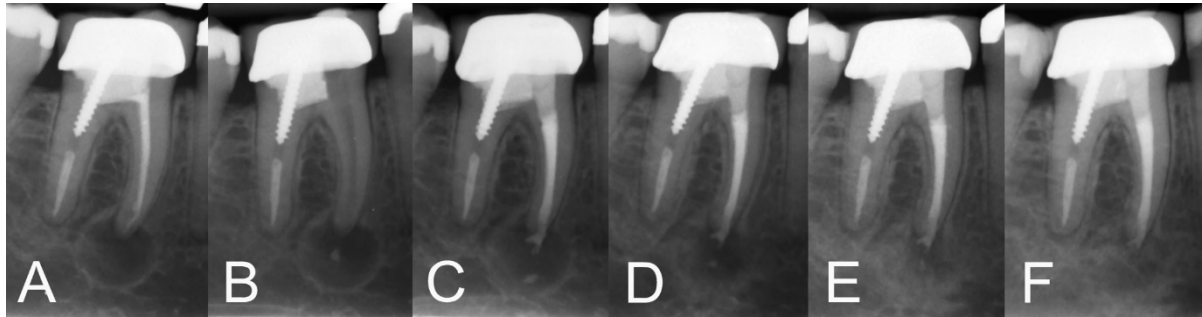


Fig. 1. Clinical radiographs of the case. (A) Pre-operative periapical radiograph showing a well-defined radiolucent lesion with a corticated border at the apex of the mesial root of tooth #46, indicative of a cystic apical lesion associated with root resorption. (B) Access to the mesial canals of tooth #46 was achieved, and thorough cleaning and shaping were performed using hand and rotary instruments. (C) The canals were filled and sealed with CEM cement as the obturation biomaterial. (D) Periapical radiograph taken at 6-month recall showing a mild reduction in the size of the periapical lesion. (E) Periapical radiograph taken at 12-month follow-up showing more reduction in the size of the cystic lesion. (F) Periapical radiograph taken at the 54-month follow-up, demonstrating complete healing of the cystic apical lesion, with no signs of recurrence.

Case Presentation

A 35-year-old woman presented with mild discomfort in the mandibular right first molar (#46). Clinical examination showed a fit prosthetic crown and normal periodontium, with no swelling, sinus tract, or periodontal pocket. Periapical radiographs revealed a well-defined radiolucent lesion with a corticated border at the apex of the mesial root of an endodontically treated tooth (#46), suggestive of a cystic apical lesion (Fig. 1A). In addition, poor root canal obturation of the apical third of the mesial root canals indicated previous internal resorption. Nonsurgical endodontic retreatment of the affected mesial root canals was recommended.

After obtaining informed consent, a modified access cavity was prepared via the porcelain-fused-to-metal crown to achieve entrance to the mesial canals of tooth #46. The canals were thoroughly cleaned and shaped using a combination of hand and rotary instruments, with full-strength NaOCl used as an irrigant for proper disinfection (Fig. 1B). Thereafter, the canals were filled and sealed with CEM cement as an obturating biomaterial. The access cavity was then permanently filled using composite resin (Fig. 1C). One week post-treatment, the patient reported a reduction in pain, and no inflammation or infection was found on clinical examination. Periodic periapical radiographs showed a gradual reduction in the size of the radiolucent lesion (Fig. 1D-E). At the 54-month follow-up, the periapical radiograph showed complete healing of the cystic apical lesion. The tooth is still functional and asymptomatic, with no signs of recurrence (Fig. 1F).

Discussion

This case report demonstrates the successful nonsurgical endodontic retreatment of a cystic lesion associated with root resorption, using root canal filling with CEM cement. CEM cement, with its excellent sealability, biocompatibility, and bioactivity, in addition to antimicrobial effects, proved to be an ideal obturation biomaterial, promoting periapical healing in this case report [2]. Proper filling and sealing of the communication path between the infected root canal system and periradicular tissues are crucial for achieving successful treatment outcomes, and CEM cement as a root-end filling biomaterial is effective in achieving this goal [3]. The favorable treatment outcomes in this case support the potential of nonsurgical endodontic retreatment using an endodontic biomaterial like CEM cement for certain cystic apical lesions, offering a viable alternative to traditional surgical enucleation, even in cases with inflammatory root resorption. This conservative approach offers a new perspective for treating certain cystic apical lesions, contributing to improved patient outcomes and satisfaction. Further clinical trials with larger populations are warranted to corroborate the long-term efficacy of this approach.

Ethical Considerations

Compliance with ethical guidelines

Written consent has been obtained from the patient. The principles of the Helsinki Convention were also considered.

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Conflict of Interests

The author has no conflicts of interest relevant to this article.

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