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Precision Management of Internal Resorption in a Central Incisor: Preserving Strength and Aesthetics

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Abstract

Internal resorption is a rare but important dental condition where the tooth's internal tissues gradually get absorbed, which can lead to pain, swelling, and weakening of the tooth. In the early stages, it might not cause any symptoms, but over time, it can result in pain, tooth discoloration or swelling. This report describes the clinical signs, diagnosis, and treatment of internal resorption in a maxillary central incisor. It also outlines how internal root resorption was managed in the case study.

Identifying internal resorption early is crucial to begin endodontic treatment before the tooth's hard structures are damaged.

The treatment plan involved endodontic treatment using Mineral Trioxide Aggregate, followed by a restoration of the tooth's crown.

Detecting internal resorption quickly allows for timely treatment, like endodontic therapy, which can halt the disease's progression and help save the tooth.

If treatment is delayed, the condition can become more severe, potentially leading to tooth loss. This report highlights the importance of acting promptly once internal resorption is identified.

Keywords: Root resorption, CBCT, MTA, Tooth discoloration, Case report

Introduction

A specific kind of pulp condition known as internal root resorption involves the loss of dentine, triggered by clastic cells that become active due to inflammation within the pulp. This type of resorption is connected to chronic partial pulp inflammation and partial pulpal death, which typically occur after the death of the odontoblasts.

Internal inflammatory root resorption often arises following orthodontic movement, traumatic injuries, or ongoing pulp infections.

It is a gradual process that is usually detected incidentally during standard radiographic exams. Internal root resorption can lead to substantial tissue loss, which is generally irreversible. In more complicated cases, some dental professionals may suggest removing the tooth and replacing it with an

implant for more predictable results. To close the resorptive defect, the material used for root canal filling must flow. Because MTA has favourable qualities like biocompatibility, bioactivity, and excellent tolerating by peri radicular tissues, it is the material of choice for sealing root canal perforations.1

The filling material used to close the resorptive defect must be able to flow. Since MTA (mineral trioxide aggregate) has favorable qualities such asbioactivity, and good tolerance by surrounding tissues, it is the preferred material for sealing root canal perforations.

Case Report: A 22-year-old male patient visited the Department of Conservative Dentistry and Endodontics with a main concern of localized discoloration involving the maxillary central incisor (Figure 1). His medical history was unremarkable. He had a history of trauma ten years prior.

Figure1: Preoperative image depicting discoloration irt 11.

Radiographic examination showed a well-defined radiolucent area indicating internal root resorption in the middle third of the pulp chamber, extending into the root canal space, which suggested internal resorption (Figure 2)

Figure2: Preoperative radiograph showing well defined radiolucency in middle 3rd of root canal

The CBCT scan revealed an irregularly shaped resorptive defect within the pulp chamber, characterized by a well-defined radiolucent area (Figure 3).

Figure3: Preoperative CBCT scan Image

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Following the diagnosis, a treatment plan was formulated. The patient was informed about the status of oral health, and a treatment plan was suggested. Local anesthesia was administered, and the tooth was isolated with a rubber dam to maintain a clean and dry working area. An access cavity was conservatively prepared on the palatal surface to reach the pulp chamber. Once access was achieved, the canal was irrigated with sodium hypochlorite and EDTA was used with the purpose of dissolving the necrotic tissue of concavities in resorption area. Canal was then shaped using a series of endodontic files. (Figure 4)

Figure 4: Access opening and BMP done

The root canal was obturated using gutta-percha along with a biocompatible sealer to ensure a hermetic seal. (Figure 5)

Figure 5: Obturation done

To manage the resorption, mineral trioxide aggregate (MTA) was employed to fill the resorptive defect followed by post endodontic composite restoration. (Figure

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Figure6: MTA placed in resorptive defect

Following crown preparation for additional aesthetic rehabilitation, a putty imprint was taken to fabricate a fixed partial denture. (Figure 7)

Figure 7: Shade selection was done following crown preparation

Figure 8: A Fixed Partial Denture was fabricated

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Figure 9: Post op smile

Post-treatment evaluations demonstrated significant improvements. Patient was satisfied with the treatment. The clinical follow-up showed adequate clinical function and absence of clinical symptoms.

Discusion:

The prognosis of endodontic treatment is exacerbated by root perforation brought on by severe internal resorption because it weakens the remaining tooth structure and may implicate the periodontal system.2,3

A range of professionals are needed to comprehend the etiology, pathogenesis, diagnosis, and therapy of inflammatory root resorption, which is a multidisciplinary issue.4

Internal resorption-induced perforations can present with no symptoms. According to this report, the patient did not complain of any discomfort or swelling during the initial session, and the radiological examination's accidental discovery of a root resorption.5

It is widely believed that inflammatory root resorptions, both internal and external, are frequently misidentified and misinterpreted. Since internal and exterior resorptions are completely distinct clinical processes with diverse etiological variables and therapeutic procedures, a proper diagnosis is crucial. Clinical findings are used to support the diagnosis, which is mostly based on radiological features. Radiographs taken at different angles will cause the radiolucency on the root to shift in external resorption, whereas in internal resorption, the radiolucency will remain close to the canal. These are accepted radiographic characteristics that distinguish internal from external resorptions.6

MTA was applied into the canal defect to fill the resorbed area and seal the perforation. MTA was chosen in this instance due to its well-known repair properties, as well as its excellent mechanical strength and sealing capabilities.7

Tooth discoloration is one of the main known drawbacks of MTA, and when applied to the anterior teeth, this could be an aesthetic issue. Several theories have been put forth to explain the cause of MTA tooth discolouration.7,8,9

The size of the lesions has a major impact on how well teeth with internal root resorption respond to treatment. Large lesions reduce the tooth's ability to withstand shear stress, which increases the risk of tooth breakage. Therefore, to stop the resorptive process from progressing further and to avoid fractures of the root or cervical crown, it is essential to start an endodontic treatment as soon as feasible.10

Conclusion:

Internal resorption is a challenging dental condition that requires early diagnosis and effective treatment to preserve tooth integrity. Advanced imaging, such as CBCT, is essential for assessing the extent of resorption.

Successful management involves thorough cleaning, removal of resorptive tissue, and sealing the defect with biocompatible materials like mineral trioxide aggregate (MTA). Long-term follow-up is crucial to ensure healing and treatment stability. A comprehensive approach improves patient outcomes, preserves natural dentition, and enhances overall oral health.

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After a follow-up of more than 12 months, clinical and radiographic examinations have demonstrated the most favorable results from the use of biomaterials, such as MTA, in teeth with perforating internal root resorption. This could be a great substitute for implant insertion. Significant tooth discoloration may occur despite MTA's promising biological and mechanical qualities, underscoring the need for more study.

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