

Case Report

Perforating Internal Resorption - A Case Report

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ABSTRACT

Internal resorption is a rare type of resorption in permanent teeth, which is characterized by resorption of the internal aspect of the dentin adjacent to granulation tissue produced in the pulp. Pulp tissue is inflamed because of an infected coronal pulp space or as a result of trauma. Internal resorption may progress slowly or rapidly. If progression is rapid, it may result in a perforation of the crown or root within a few weeks.

This is a case report of a 13 year female patient presenting with perforating internal resorption. The case was treated by debridement and obturation of the canal and sealing the perforation with MTA. 3 month follow-up showed complete healing of lesion. 6 months and 12 months recall showed the patient to be completely asymptomatic and able to perform normal masticatory functions with the tooth.

Keywords: Perforating internal resorption, MTA, Calcium hydroxide.

INTRODUCTION

Internal resorption is a rare type of resorption in permanent teeth, which is characterized by resorption of the internal aspect of the dentin adjacent to granulation tissue produced in the pulp. Although there are different theories on the origin of the pulpal granulation tissue involved in internal resorption, the most logical explanation is that the pulp tissue is inflamed because of an infected coronal pulp space or as a result of trauma.

Resorption can occur due to decrease in PH, as in case of irreversible pulpitis, so that the dentin and enamel is dissolved by chelation. The untreated internal resorption can progress into external resorption which may cause fracture of the tooth. [1]

In case traumatic injury, intrapulpal hemorrhage can develop. Formed

blood clots are then organized and replaced by granular tissue which compresses dentin wall of the pulpal chamber or root canal. This activates undifferentiated mesenchymal cells of pulp tissue to form dentinoclasts that cause resorption of hard tissues of tooth. [1]

Diagnosis:

- 1) Clinically internal root resorption is usually asymptomatic. Teeth in which resorptive process reaches cervical area of the crown may have a pinkish color, known as 'pink tooth' resulting from granulation tissue in growth. [1,2]
- 2) Generally diagnosed through routine radiographs which reveals a round-to-oval radiolucent enlargement of the pulp space. [3] Radiograph performed at different angulation confirms that the resorptive lacuna is a continuation of the distorted border of the root canal.

- 3) Electron microscope shows the pulpal-dentin wall without odontoblasts. Dentinoclasts, large in number, have size of 50µm and with numerous filopods are turned towards dentin surface and attached to it. ^[4]
- 4) Cone beam computed tomography (CBCT) is a relatively new three dimensional imaging technique requiring a significantly lower radiation dose than conventional computed tomography. With traditional computed tomography, a narrow fan shaped X-ray beam makes a series of rotations around the patient's head as they are incrementally moved through the machine. The raw data from each rotation is then reconstructed to produce tomographic images. CBCT differs from conventional computed tomography imaging in that the whole volume of data is acquired in the course of a single sweep of the scanner. Axial, transverse, and tangent slices, number of root surfaces, and actual root resorption extension can be analyzed. ^[4,5]
- 5) Light microscope shows different levels of inflammation of the pulpal tissue with infiltration of predominant lymphocytes, macrophages and some leukocytes, dilated blood vessels and multinucleated dentinoclasts in resorptive lacunae on the pulpal-dentin surface. ^[6]

Pain may be a presenting symptom if perforation of the crown occurs and metaplastic tissue is exposed to oral fluids. It is also possible that extension of the resorption through the dentin into the oral cavity may result in pulpitis and periapical inflammation.

Internal resorption as a destructive process may progress slowly or rapidly. If progression is rapid, it may result in a perforation of the crown or root within a few weeks. ^[7,8] The treatment of this condition should be initiated as soon as possible to prevent further loss of hard tissue or eventual root perforation. ^[7]

In advanced stages, it is often very difficult to distinguish external root

resorption from internal root resorption and aiming at a more predictable outcome some clinicians suggest apicoectomy or extraction of the tooth with prosthesis replacement. However, preservation of the tooth is important not only to aid in mastication and aesthetics but also from psychological standpoints especially in case of paediatric patients.

CASE REPORT

A female patient, aged 13 years, came to the OPD of Dr R. Ahmed Dental College & Hospital with chief complaint of severe pain in right lower posterior region of mouth.

Clinical Examination revealed mesio-occlusal carious lesion in 45. Tooth was extremely tender on palpation and percussion.

Investigation: IOPA X-Ray of 45 showed a flame shaped radiolucent area with perforation of disto-lateral wall in apical third of root canal. Radiolucency extended periapically from the lateral side (Fig.1).

Diagnosis: Based on the clinical and radiological findings, a diagnosis of Perforating Internal Resorption was made.

Treatment: A treatment plan was made to debride and obturate the canal and seal the perforation with MTA. An Inferior alveolar block was given and Rubber Dam was placed. Access opening was done and after determining the working length with a #15K file, biomechanical preparation of canal was done with hand protaper files till F1 and irrigation with 5.2% sodium hypochlorite solution. Care was taken in preventing overzealous instrumentation of perforated lateral wall. After canal drying with absorbents paper points, canal was completely filled with water soluble, non setting calcium hydroxide paste (R C CAL, Prime dent, India) and access opening was sealed with IRM.

Patient was prescribed ibuprofen 200 (NSAID Analgesic) to be taken on SOS basis and asked to report after 1 week.

At 1 week follow-up patient was completely asymptomatic. Calcium

hydroxide dressing was changed and patient asked to report after 1 month.

At 1 month follow-up, IOPA showed substantial healing of lateral and periapical lesion. (Fig.2)

Calcium hydroxide dressing was changed every month for 3 consecutive months.

3 month follow-up showed complete healing of lesion (Fig.3).

Calcium hydroxide was completely removed from the canal and MTA (Angelus, Brazil) was placed in the region of defect in the canal to aid in formation of dentin bridge, thus causing healing of defect A wet cotton was placed in the canal to aid in setting reaction and access was sealed with IRM. Patient was asked to report after 24 hours.

After 24 hrs cotton was removed from the canal and the remaining part of canal was obturated with guttapercha and sealer. Access was sealed with light cure

composite resin and post-obturation IOPA was taken. Patient was asked to report after 1 month.

After 1 month tooth was restored with PFM Crown. Patient was recalled for a follow-up after 6 months (Fig.4) and 12 months (Fig.5). Patient was found to be asymptomatic and was able to perform normal masticatory functions with the tooth. IOPA showed complete healing of lesion.



Fig.1: Pre-operative IOPA X-ray of 45



Fig.2: 1 month follow-up with Ca (OH)₂ dressing



Fig.3: 3Months follow up(after obturation)



Fig.4: 6 months follow-up



Fig.5: 12 months follow-up

DISCUSSION

Clinical detection of internal resorption is followed by endodontic treatment to arrest and prevent further resorption. Extensive perforating internal resorption may complicate the prognosis of endodontic treatment due to weakening of the remaining dental structure and associated bony destruction and changes. The outcome of treatment of teeth with internal root resorption depends primarily on the size of the lesion. Large lesions cause a reduction in the resistance of the tooth to shear forces that may lead to tooth fracture. Therefore, it is imperative to initiate endodontic treatment as soon as possible. [9] Many clinicians face the dilemma of whether to treat a tooth with a questionable prognosis endodontically perform apicoectomy or extract it and subsequently place prosthesis.

When resorption involves external communication with the periodontal ligament space, the perforation site should be repaired prior to completion of treatment. [10] It is well established that a properly executed BMP and appropriate intracanal medicament can heal periapical lesions even when there are associated cystic changes. MTA strengthens the root when used intracanal. So, endodontic treatment along with MTA could be the first option in these cases rather than invasive surgical procedures like apicoectomy or extraction.

In this case, Ca (OH)₂ was used as intracanal medicament because of its well established disinfecting property. When placed in canal for a month it kills more than 99% of microbes both in canal wall and root dentinal tubules. The first Ca (OH)₂ dressing was changed after 1 week as it got neutralized and washed off due to the acidic inflammatory content of infected canal. Water based Ca (OH)₂ was used here. Although oil based Ca (OH)₂ are more effective since they are not easily washed off from the canal and stay for longer duration, they are difficult to remove from canal and so hinder with proper sealing of canal during obturation.

To seal the lateral wall perforation, MTA was used instead of Ca (OH)₂ as the latter takes much longer time to form dentin bridge (4 months-2 yrs) than MTA (only 2-4 weeks). Also dentin bridge formed with Ca(OH)₂ is more porous and has vascular inclusions making it more predisposed to leakage and failure. Moreover MTA has good biocompatibility, sealing ability, lower overfilling tendency, and non-cytotoxicity. [11,12] MTA being a bioactive material, it forms hydroxyapatite crystals and thus strengthens the weak thin root dentin.

During all the initial sittings access was closed with IRM rather than ZOE, and after obturation light cured composite was used to prevent coronal micro leakage as it is one of the commonest reasons for treatment failure.

CONCLUSION

Cases of perforating internal resorption can be managed conservatively with conventional endodontic treatment and MTA, rather than going for invasive surgical procedures like apicoectomy or tooth extraction that are distressing and debilitating to paediatric patients.

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