

NON-SURGICAL MANAGEMENT OF INTERNAL ROOT RESORPTION OF MAXILLARY INCISOR: A CASE REPORT

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Abstract

Internal resorption is a relatively rare phenomenon where resorption begins within the root canal and destroys the surrounding hard tissues. Management of internal root resorption is a challenge to the dental practitioners. It may occur in cases with chronic pulpal inflammation following caries or due to trauma. Most cases of internal root resorption are seen in the anterior teeth, due to their susceptibility to trauma. However, it may be seen in the posterior teeth. Early diagnosis, removal of the cause, proper management of the resorbed root is mandatory for successful treatment outcome. This paper presents a case having resorptive defect in the root canal of maxillary right central incisor which was treated nonsurgically with thermoplasticized gutta percha obturation technique.

Key Words Pulpal inflammation, trauma, internal root resorption, thermoplasticized gutta percha technique.

INTRODUCTION

Internal resorption has been described as a resorptive defect of the internal aspect of the root canal following necrosis of odontoblasts. This results in chronic inflammation and bacterial invasion of the pulp tissue¹. The diagnosis and management of the internal resorption demands a deviation from the normal root canal treatment procedure. Since the defect is asymptomatic, delayed diagnosis is not uncommon. The pathognomic feature of the internal resorption is the appearance of a 'pink spot' of on the labial surface of crown. This provides a clue to the operator.

Andreasen has made a unique contribution to the understanding of tooth resorption following dental trauma. His original classification is the most widely accepted².

Etiology of internal root resorption (IRR) is quite unclear. Various factors have been proposed for the loss of predentin. Trauma seems to be the most common. In a study conducted by Calis et al including 27 patients, trauma was the most common etiological factor (43%), followed by carious lesions (25%)³. Other predisposing factors are orthodontic tooth movement, tooth bleaching, chronic inflammation of the pulp and periodontal tissues, and extreme heat production while preparing the cavity. The occurrence of internal resorption has been estimated to be between 0.01% and 1%⁴. One study concluded that internal root resorption was found in 1 out of 1,000 teeth⁵. The condition is more commonly observed in male than female patients. The most commonly affected teeth reported were the maxillary incisors⁶.

As in other inflammatory resorptive defects, the histologic picture of the internal resorption is

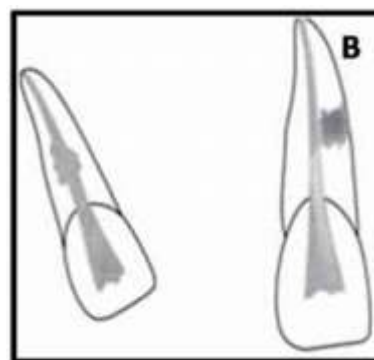
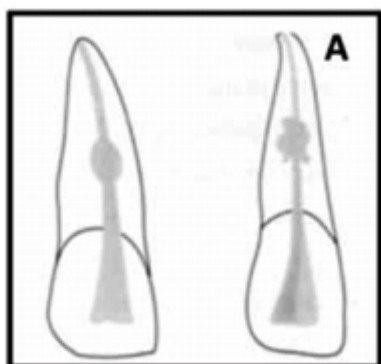
Formation of the granulation tissue. An area of the necrotic pulp is found coronal to the granulation tissue.

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Differential diagnosis of internal & external resorption; Gartner et al.7

Internal Resorption	External Resorption
Sharp, smooth clearly defined margins	Less well defined margins, “moth eaten” appearance
Most defects are Symmetrical	Usually defect nonsymmetrical
Defect is uniformly radiodense	Variation in radiodensity due to resorption and repair
Canal is not seen in the radiographic lesion	Canal can be followed unaltered through the area of the lesion
change in angulation (mesially angulated) – no shift in the lesion over the canal. All though shape may change.	Change in angulation (mesially angulated) – shift from its position over the canal



(Lesion is within the confine of root canal on [Lesion shift on changing angulations] angled radiographs.)

Dentinal tubules containing microorganisms communicate between the necrotic zone and the granulation tissue. Unlike the external resorption, the adjacent bone is not affected with the internal resorption⁸.

CASE REPORT

A 17 year old male patient reported to the department of Conservative Dentistry and Endodontics at the Haldia Institute of Dental Sciences and Research for endodontic treatment of the maxillary central incisor with chief complaint of tooth discolouration (fig-1)

He had a history of trauma to the maxillary front teeth three years ago.. The affected teeth were 21 & 11. Both the teeth elicited mild tender on percussion, pulp testing revealed a nonvital pulp. No periodontal pocket was found. No intra oral swelling was seen. Intraoral periapical radiograph was advised and it revealed the presence of an oval shaped radiolucency at the junction of coronal & middle one third of the root. This was suggestive of internal resorption of 21 (fig-2).

Treatment plan included endodontic treatment of tooth no. 21 & 11 followed by post endodontic restoration.

Access cavity was prepared with high speed air turbine with careful attention to the direction of the diamond point to prevent accidental perforation. An ISO no. 10 K- file was introduced in the canal & straight line access was established with Gates - Glidden Drills. Canal was thoroughly irrigated with 5.25% sodium hypochlorite. The working length of the tooth was determined by finding the apex using apex locator. The canal was enlarged with stainless steel hand files with EDTA as a lubricant. Circumferential filing with H- files was done to remove the necrotic debris. The apical portion of the canal was enlarged to size no. 55 K- file & a stepback preparation was done. 5.25% sodium hypochlorite was used for irrigation. Canal was dried with sterile paper points. An intracanal medicament of calcium hydroxide paste was placed within the canal. The access cavity was sealed with temporary filling material. This dressing was changed once after an interval of 4 weeks. At the end of 12 weeks the temporary filling was removed, calcium hydroxide was flushed out. The canal was dried and coated with a resin sealer, sectional obturation was done upto



Fig-1: preoperative view



Fig-2: Preoperative I.O.P.A radiograph view



Fig-3: Calamus



Fig-4 Immediate postoperative radiograph



Fig-5, 12 months postoperative I.O.P.A. R view



Fig-6 PFM crown delivered

resorptive area. The remaining canal was obturated with thermoplastized gutta percha technique (fig-3).

Warm gutta-percha at the canal orifice was vertically compacted by using appropriate sized pluggers. A 2 mm thick layer of Glass Ionomer Cement was placed at the chamber orifice for coronal seal. The access cavity was sealed with light cure composite. A postoperative radiograph (fig - 4,5) shows densely compacted gutta-percha in the resorptive defect. Finally postoperative restoration with porcelain fused to metal crown was given to patient (fig-6).

DISCUSSION

Internal inflammatory root resorption is a pathological process, initiated within the pulpal space and associated with loss of dentine. It is often described as an oval shaped enlargement of the root canal space and is usually asymptomatic and

detected by radiographs. When diagnosed, removal of the causative agent is mandatory, to arrest the cellular activity responsible for the resorptive phenomenon⁹. Internal resorption is usually asymptomatic. The patient reported with esthetic concern having discoloration of his teeth.

In this case the patient opted for a non extraction treatment. The endodontic treatment of teeth with internal root resorption is complicated due to the complexity of removing the tissue of the resorption cavity. However, the soft tissue can be dissolved by the use of sodium hypochlorite in raised concentrations, followed by the use of intracanal medication with calcium hydroxide. The difficulties in cleaning the concave resorptive area demands a cleaning with chemical substances with an appropriate organic solvent property¹⁰. The endodontic instrumentation of that resorption area can results in communication with the periodontium that could cause difficulties in the prognosis¹¹. The primary aim of root canal treatment is to disinfect the root canal system followed by obturation of the canal

with an appropriate root filling material to prevent reinfection. Despite recent advances in endodontic techniques, instruments and irrigants are unsuccessful in accessing the restricted areas of the canal space.¹² Studies show the success of sodium hypochlorite and calcium hydroxide in removing the resorptive and other tissues from the root canal.¹³⁻¹⁸ The use of calcium hydroxide also has two significant goals: to control bleeding, and to necrotize residual pulp tissue and to make the necrotic tissue more soluble to sodium hypochlorite. Research shows that the thermoplastic gutta-percha techniques are significantly better in filling artificial resorptive cavities than master cone systems and cold lateral condensation (CLC). The cold lateral compaction technique produced slightly fewer voids but large proportions of the canal space was filled with sealers. The thermoplastic gutta-percha obturation technique assures a predictable three dimensional hermetic seal in the apical, middle and coronal third of even the most complex canal anatomies.

When multiple teeth are involved resorption does not necessarily occur at the same rate¹⁹. Separate lesions can begin times apart and progress at a different pace. The necessary endodontic treatment of the concerned tooth was provided and follow up of three to six months was scheduled to rule out any recurrence. The treatment and prognosis both depend on the stage of the defect²⁰. When prognosis of a tooth with internal root resorption, is endodontically treated, the call for radiographic vigilance every six months for at least two years is to be done. In the reported case the tooth is symptom less. A longer record (3-4 years) is required to rule out any reappearance of the lesion. There may be chances that the area of resorption to present a lateral canal, which would allow the continuity of the resorption process and compromise the treatment process¹². The prognosis depends upon the location of the lesion (supra osseous or infra osseous), the time elapsed since resorptive defect started, contamination of site, bone loss at site and choice of sealer used. The motto in the cases was to prevent additional resorption.

SUMMARY

Internal inflammatory root resorption is a particular category of pulp disease, which can be diagnosed by clinical and radiographic examination of teeth in daily practice. Today, the diagnosis of internal root resorption is significantly improved by the three-dimensional imaging. Modern endodontic techniques including optical aids, ultrasonic augmentation of chemical debridement, thermoplastic filling techniques should be used during the root canal treatment of internally resorbed teeth. Alternative materials such as calcium silicate cements offer new opportunities for the rehabilitation of resorbed teeth. In these conditions,

the prognosis of the treatment of internal resorptions, even if root walls are perforated, is good.

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