

# Non-Surgical management of internal resorption: A Case Report

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**Abstract-** Internal resorption is a relatively a rare phenomenon where resorption begins in the root canal and destroys surrounding dental hard tissues. Management of internal root resorption is a challenge to the dental practitioners. It may usually occur in cases with chronic pulpal inflammation, following caries or due to trauma in the form of an accidental blow. Most cases of internal root resorption are seen in anterior teeth, due to their susceptibility to trauma. However, it may be seen in posterior teeth, most likely because of carious involvement of the pulp. Early diagnosis, removal of the cause, proper treatment of the resorbed root is mandatory for successful treatment outcome. This paper presents a case having resorptive defect which was treated nonsurgically with thermoplasticized gutta-percha obturation technique.

**Keywords:** Pulpal inflammation, trauma, internal root resorption, thermoplasticized guttapercha technique.

## INTRODUCTION

Internal resorption has been described as a resorptive defect of the internal aspect of the root following necrosis of odontoblasts as a result of chronic inflammation and bacterial invasion of the pulp tissue<sup>1</sup>. The diagnosis and management of the internal resorption demands a deviation from the standard procedure. Since the process is asymptomatic, it

results in late diagnosis. The pathognomic feature of the internal resorption is the appearance of the ‘pink spot’ providing a clue to the operator.

Andreasen has made a unique contribution to the understanding of tooth resorption following dental trauma and his original classification remains the most widely accepted<sup>2</sup> i.e.

Tooth Resorption-

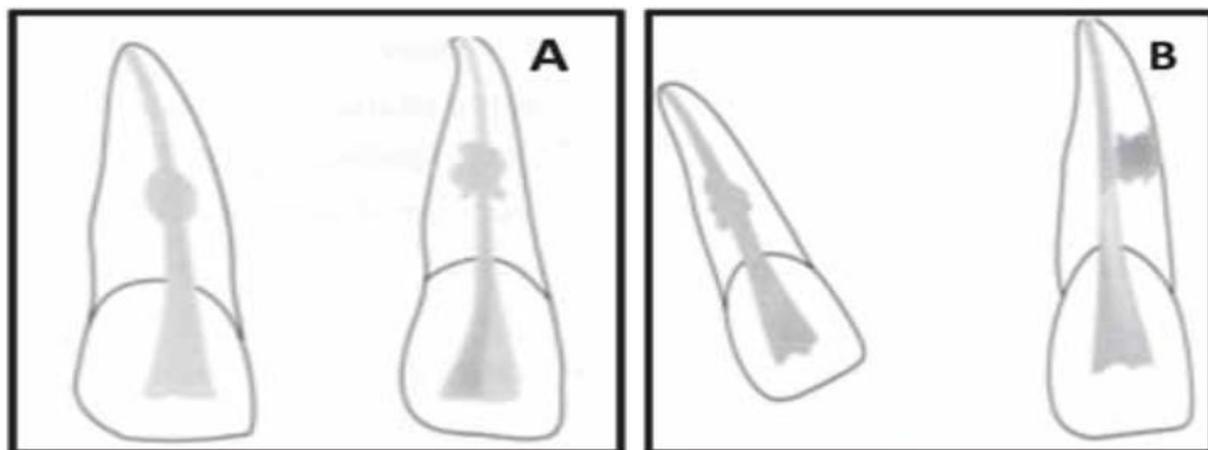
- a)Internal- 1) Inflammatory. 2) Replacement
- b)External- 1) Surface. 2) Inflammatory. 3) Replacement.

Etiology of internal root resorption (IRR) is quite unclear. Various etiologic factors have been proposed for the loss of predentin, and trauma seems to be the most advocated. In a study including 27 patients, trauma is the most common etiological factor (43%), followed by carious lesions (25%)<sup>3</sup>. Many others responsible predisposing factors are orthodontic tooth movement, tooth bleaching, chronic inflammation of the pulp and periodontal tissue, as well as extreme heat production while cutting dentin. The occurrence of internal resorption has been estimated to be between 0.01% and 1%<sup>4</sup>. One study concluded internal root resorption in 1 out of 1,000 teeth<sup>5</sup>. The condition is more commonly observed in male than female subjects. The most commonly affected teeth reported were maxillary incisors<sup>6</sup>.

Differential diagnosis of internal & external resorption; Gartner et al.<sup>7</sup>

InternalResorption	ExternalResorption
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.)

Like that of other inflammatory resorptive defects, the histologic picture of the internal resorption is granulation tissue with the multinucleated giant cell. An area of the necrotic pulp is found coronal to the granulation tissue. Dentinal tubules contain microorganisms and communicate between the necrotic zone and the granulation tissue. Unlike the external resorption, the adjacent bone is not affected with the internal resorption<sup>8</sup>.

#### CASE REPORT

A 17 year old male patient was referred to the department of Conservative Dentistry and Endodontics at North Bengal Dental College & Hospital for endodontic treatment of the maxillary central incisor with chief complaint of tooth discoloration (fig-1). He gave a history of trauma in the maxillary front teeth region three years back. No intra oral swelling was seen. The affected teeth were 21 & 11. Both the teeth were mild tender to percussion and pulp testing revealed non vital pulp. No periodontal pocket was seen. Radiograph was advised and it revealed the presence of an oval shaped radiolucency at the junction of coronal & middle one third of the root 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 ( Sybron Endo) was introduced in the canal & straight line access was established with Gates - Glidden Drills. Canal was thoroughly irrigated with 5.25% sodium hypochlorite (HypodontSteri-chem). The working length of the tooth was measured by Root ZX apex locator (J Morita Mfg.corp., Kyoto, Japan). The canal was enlarged with stainless steel hand files using EDTA (Glyde, Dentsply) as a lubricant. Circumferential filing with H- files (Sybron Endo) 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. Finally sodium hypochlorite was introduced in the canal & ultrasonically activated with a no. 15 K- file attached to a piezoelectric unit (Acteon, Satelec) for one minute. Canal was dried with sterile paper points & an intracanal paste of creamy consistency made by mixing calcium hydroxide powder & distilled water was placed. The access cavity was sealed with Cavit™ G (3M ESPE AG). 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 coated with AH plus sealer( AH PlusDentsply), sectional obturation was done till resorptive area. The remaining canal was obturated with thermoplastized guttapercha technique (Calamus, Dentsply) (fig-3). Warm gutta-percha at the orifice was vertically compacted by using appropriate sized pluggers. A 2 mm thick layer of Glass Ionomer Cement( GC Gold Label glass ionomer Universal Restorative 2) was placed at the orifice for coronal seal. The access cavity was sealed with Z 250 composite (3M ESPE, USA). 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 pulp 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 detectable by radiographs. When diagnosed, immediate removal of the causative agent must be considered, aiming to arrest the cellular activity responsible for the resorptive activity<sup>9</sup>. Internal resorption is usually asymptomatic, the patient reported with esthetic reasons having discoloration due to intrapulpal hemorrhage. The options available for treatment were either endodontic treatment followed by crown or the extraction of teeth with replacement by an implant or prosthesis – fixed or removable.

In this case the patient opted for a non extraction regimen. The endodontic treatment of teeth with internal root resorption is complicated due to the complexity in removing the tissue of the resorption cavity. However, the soft tissue can be dissolved by the use of sodium hypochlorite in elevated concentrations followed by the use of intracanal medication with calcium hydroxide. The complicatedness in cleaning the concavity resorption area demands a cleaning with chemical substances that have an appropriate organic solvent ability<sup>10</sup>. The endodontic instrumentation of that resorption area can result in communication with the periodontium that could cause difficulties in the prognosis. Balancing the effect of the sodium hypochlorite, we used the intracanal medication with calcium hydroxide for a

prolonged period<sup>11</sup>. 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 it from reinfection. Despite of recent advances in endodontic techniques, instruments and irrigants are found to be unsuccessful to access the restricted areas of the canal space. The use of ultrasonic is to agitate the irrigant to improve the removal of necrotic debris and biofilms from inaccessible areas of the root canal<sup>12</sup>. Studies on the success of sodium hypochlorite and calcium hydroxide to remove the resorptive and other tissues from the root canal indicate that they have an additive or even synergistic effect<sup>13-18</sup>. 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 were significantly better in filling artificial resorptive cavities than core systems and cold lateral condensation (CLC). The cold lateral compaction technique produced slightly fewer voids but a larger proportion of the canal space was filled with sealer with this technique.

Calamus by Dentsply is a simple, fast and effective carrier based heated Gutta Percha Obturation System. The Smooth insertion of single heated obturator assures a predictable three dimensional hermetic seal in the apical, middle and coronal third of even the most complex canal anatomies. Cases of internal resorption demand immediate and definitive treatment, so that the prognosis does not suffer. Different approaches have been suggested by several authors. The aim should be debridement and restoration of the resorptive defect by placement of a suitable medicament so that the tooth remains healthy and aesthetically retained. When multiple teeth are involved resorption does not necessarily occur at the same rate<sup>19</sup>. Separate lesions can begin times apart and progress at a different pace. The amount of tooth structure loss is of paramount importance and early diagnosis is vital. 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 defect<sup>20</sup>. When considering a prognosis for a tooth with internal root resorption, endodontically treated, the call for radiographic vigilance every six months for at least two years

should be considered. In the above given case the tooth is symptom less but 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 process<sup>12</sup>. 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. Furthermore, the CBCT's superior diagnosis accuracy resulted in an improved management of the resorptive defects and a better outcome of conservative therapy of teeth with internal resorption. Modern endodontic techniques including optical aids, ultrasonic improvement of chemical debridement, and 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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Fig-1 preoperative view



Fig-2 preoperative I.O.P.A radiograph view



Fig-3 Calamus

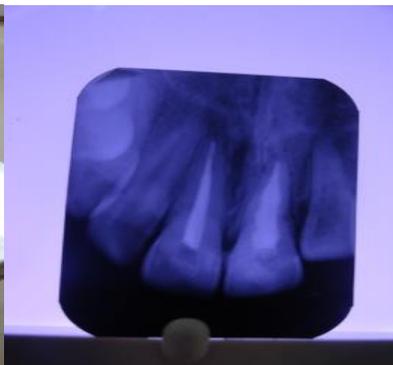


Fig-4 Immediate postoperative radiograph



Fig-5, 12 months postoperative



Fig-6 PFM crown delivered