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# Surgical Management Of A Tooth With Perforating Internal Resorption-A Clinical Challenge

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**Abstract:** Internal resorption is an unusual form of tooth resorption often complicating treatment outcome. Perforating internal resorption often results in hopeless prognosis leading to tooth extraction. The present case report showcases successful surgical treatment in a case of perforating internal resorption treated with MTA and restored with light transmitting fibre post and all ceramic crown.

**Keywords**: Internal resorption, Calcific metamorphosis, MTA, GTR membrane, Light transmitting glass fibre post

## Introduction

Root resorption is the loss of dental hard tissues as a result of activities of clastic cells[1,2]. It can be a physiological or pathological phenomenon. Though Internal Resorption is a relatively rare entity, the condition is more frequently observed in males than in females[3] and in traumatised teeth. Maxillary laterals & centrals and mandibular lateral incisors are more likely diagnosed with internal resorption. Haapasalo suggested a prevalence of 0.01%–1% for internal root resorption occurring due to inflammatory causes[4].

Internal resorption is usually asymptomatic and approximately only 2% shows clinical signs[5].

Tooth resorption may go unnoticed for many years; often the patient is unaware of it because of the lack of symptoms. Pain may be reported if the process is associated with significant pulpal inflammation. The resorption remains as long as vital tissue remains and may result in the communication of pulp tissue with the periodontal ligaments. Usually, the clinician will discover the resorption as an unusual radiographic finding on a routine examination[6].

According to Shafer "Internal resorption is an unusual form of tooth resorption that begins centrally within the tooth apparently initiated in most cases by a peculiar inflammatory hyperplasia of the pulp".

The most acceptable & logical cause is the inflammation of pulp owing to infected coronal pulp space through appropriately oriented dentinal tubules. Primary requisite for that resorption is the loss of protective barrier of odontoblastic layer & predentin while trauma and extreme heat also have been suggested as causes[7].

Genetic factors have also been implicated in the development of internal resorption. The link between interleukin- (IL-) 1 gene polymorphism and root resorption has been reported in a study of monozygotic twins[8].The presence of IL-1 + C3953 allele is the sign of predisposed susceptibility to an exaggerated inflammatory response [8]

An internal resorption lesion mainly consists of granulation tissue. The pulpal connective tissue is highly vascularized with varying degrees of

inflammation, infiltrated by lymphocytes, macrophages, neutrophilic leukocytes, and plasma cells. Neutrophils and macrophages are attached to the mineralized dentin surface. "Resorptive bays" with numerous odontoclasts are also seen [9]. Bacteria can be detected either in the dentinal tubules or in the necrotic part of the coronal root canal or in dentinal tubules communicating between the necrotic zone and the granulation tissue of teeth undergoing rapidly progressing resorption[8].

Andreasen classified resorption into internal resorption that includes inflammatory & replacement resorption & external resorption that includes surface, inflammatory & replacement resorption.

Lindskog classification subdivides resorptions into three broad groups: (1) Trauma induced tooth resorption i.e. Surface resorption, Transient apical internal resorption, Orthodontic resorption, Repalcement & pressure resorption (2) Infection induced tooth resorption i.e. Internal inflammatory apical & radicular resorption, External inflammatory resorption, Inflammatory communicative resorption (3) Hyperplastic invasive tooth resorptions i.e. Internal (invasive)replacement resorption, Invasive coronal resorption, Invasive cervical resorption, Invasive radicular resorption.[10]

Obliteration of complete or partial pulp chamber and root canal secondary to trauma is not infrequent. Microscopically, this calcific metamorphosis is characterized by multifocal, dystrophic calcifications.[11,12] There are conflicting views regarding the treatment of pulpal obliteration in permanent teeth when no periapical radiographic change or pulp test response is manifested. Some state that no treatment is necessary. They interpret calcification of the pulp chamber and root canal as being nature's root canal filling. Others view the calcification of the pulp chamber and root canal as a pathologic deterioration of the normal pulp[13-16].

This paper presents clinical challenges faced during the management of perforating internal resorption, a case report.

**Case Presentation:**

**Case Report:**

A patient came to the department of Conservative Dentistry & Endodontics with the complain of mild pain & tenderness and discoloration of teeth. Patient had a history of traumatic injury to teeth 5 years back.

On clinical examination maxillary right central incisor showed $2^0$ mobility and was tender on percussion. There was a sinus in the labial sulcus in relation to 11. Both the maxillary right and left central incisors were discolored(Fig 1)

On vitality test both the teeth gave negative response.

Radiographically 11 showed uniform enlargement of root canal space with widening of PDL space on the lateral aspect. 21 showed widening of PDL space apically along with calcification of root canal space (Fig 1).

Internal resorption of maxillary right central incisor with lateral periodontitis & Calcific metamorphosis of maxillary left central incisor with apical periodontitis was diagnosed,.

Endodontic management for both the teeth was primarily planned.

After isolation with rubber dam straight line accesses to the pulp chambers of affected teeth were prepared using diamond bur in air rotor handpiece. After determination of working length(Fig 2) biomechanical preparation was performed with K-files & H-files. Active irrigation was done with endoactivator using 6.25% NaOCl followed by an interim dressing of $Ca(OH)_2$ (Fig 3) was given to both the teeth. Patient was recalled after two weeks.

After 2 weeks clinical evaluation showed that 21 was asymptomatic and it was then obturated with gutta percha. But 11 remained tender on percussion and placement of paper point into canal confirmed oozing of blood from apical third of root. A deep periodontal pocket was noticed in the labial aspect of the tooth and dehiscence was suspected. So, the treatment plan was changed and surgical intervention was taken into consideration. A closed dressing of $Ca(OH)_2$ was given for another week.

After control of seepage from the canal the tooth was obturated with thermoplasticized Guttapercha just prior to surgical intervention( Fig 4). On surgical exploration perforation was seen at the labial aspect of root in the apical 3rd and total dehiscence of alveolar bone on labial aspect was observed. After enucleation of granulation tissue from the periapical



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bony cavity apical part of root along with perforation site was resected and retrograde preparation was done(Fig 5). Following retrograde filling with MTA(Fig 6), surgical cavity was packed with sterile bone graft(Fig 7) and a collagen membrane was placed to cover the dehiscence as well as surgical cavity to promote guided tissue regeneration(Fig 8).

On recall visit one month later there was no pain or tenderness on percussion of maxillary right central incisor and mobility had also reduced. Radiograph showed periapical healing in progress(Fig 9).

Due to the reduced thickness of root dentin, it was planned to restore the tooth with light transmitting glass fiber post to reinforce the tooth by monoblock formation. Extracoronal restoration was then provided on both the teeth (Fig 10).

Patient was again followed up at 6 month & 1 year interval and satisfactory periapical healing was observed.

**Discussion:**

Traumatic injury to pulp may be a predisposing factor for the calcific metamorphosis as well as for the internal resorption of the tooth. Calcific metamorphosis is probably initiated by a stimulation of odontoblastic activity whereas Internal resorption by stimulation of odontoclastic activity[15.]

Physiologically the pulpal wall is protected from the action of the clastic cells by the odontoblastic layer and pre-dentin layers. Therefore, for internal root resorption to occur, the external protection of the odontoblast layer and the pre-dentin of the root canal wall must be destroyed, resulting in exposure of underlying mineralized dentin to the odontoclasts[17,2].

Hence, Internal root resorption is the progressive destruction of intraradicular dentin and dentinal tubules along the middle and apical thirds of the root canal walls as a result of clastic resorption [18].

Perforating internal resorption may complicate the prognosis of endodontic outcome due to weakening of the remaining dental structures and possible periodontal involvement.

Prognosis of the tooth can also be influenced by the biomaterial employed for the treatment. MTA is most commonly used for perforation repair and also as retrograde filling material because of its biocompatibility, sealing ability and potential to induce osteogenesis and cementogenesis.

Though endodontic management was considered initially in this case, surgical intervention became necessary for management of perforation, removal of granulation tissue from the resorption cavity and to restore the cavity with a biocompatible material, bio-graft.

As complete dehiscence of alveolar bone was observed in 11 collagen membrane was placed on the root to promote Guided Tissue Regeneration & to prevent post-surgical denudation.

As this resorption had made the tooth more vulnerable to fracture due to reduced root dentin thickness, adhesive restoration of the tooth using light transmitting glass fiber post was done to form a single continuum, Monoblock that gives reinforcement against stresses. The patient was followed at regular interval and found asymptomatic.

**Conclusion:**

Early diagnosis, elimination of predisposing factors, proper endodontic treatment of the resorbed tooth is mandatory for successful treatment outcome. Internal resorption being an unusual resorption of the tooth starts from the root canal and destroys the adjacent tooth structure. The process of internal root resorption may be controlled by severing the blood supply to the resorbing tissues with proper endodontic therapy.

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