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Management of Internal Resorption

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Abstract
Internal resorption is an insidious process and commonly found with the history of trauma. The involved tooth is asymptomatic. It is relatively a rare resorption, begins in root canal and destroys dentinal hard tissues. Transformation of normal pulp to granulomatous tissue consisting giant cells which resorb dentin leads to resorption. Other factors like caries, restorative procedures, orthodontic procedures and idiopathy may be considered. It can be found in all areas of tooth but most commonly in cervical third. It is very important to diagnose this condition and render an early treatment. The treatment must aim at complete removal of the resorptive tissue from the root canal system to stop further loss of dentinal hard structure. The purpose of this paper is to report a case of internal root resorption and its management.

Keyword: *Internal root resorption, Dentinoclast, Pink tooth, CBCT, Ultrasonic, Thermoplasticised gutta-parcha, Hybrid technique, MTA*

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I. Introduction

Internal root resorption is described as a resorptive defect in the internal aspect of root. It is caused by transformation of normal pulp tissue into granulomatous tissue consisting giant cells, which resorbs dentin. It occurs on the surface of the dentinal walls which forms the pulp cavity and root canal. The pulp must be vital to initiate resorption and then altered by chronic pulpal inflammation for long duration. The discontinuity of odontoblastic layer along with compromised predentin layer install an autoimmune reaction resulting in Internal root resorption[1].

The aim of the work is to report a clinical case of Internal root resorption in permanent maxillary central incisor at the middle third of root canal.

II. Case Report

A 35 year old female reported to the Department of Conservative Dentistry and Endodontics, Burdwan Dental College, Burdwan with a chief complaint of vague pain in the maxillary anterior region. Patient gave a history of trauma three years back. On clinical examination, the presence of a sinus tract at labial mucosa related to 21 was found with carious involvement of both 11 and 21. The periodontal condition was good with no attachment loss and no inflammatory condition of the related gingiva. Radiographic evaluation showed internal resorption in the middle third of the root canal system in relation to 21 and periapical radiolucency in relation to 11.

It was decided to repair the internal resorption defect with the help of MTA. Preoperative mouth rinse and extra-oral scrubbing was done with Povidone Iodine solution (2% and 5% respectively) and local anesthesia was administered. After the rubber dam isolation, access cavity was prepared in both teeth. Chemo-mechanical preparation of the canal was done in step back method with ISO stainless steel hand files in presence of copious irrigation of sodium hypochlorite solution. Activation of irrigant (6% Sodium Hypochlorite, Sterile saline water rinse, 17% EDTA solution) was done with ultrasonic (Piezoelectic unit and Irrisafe tip). 11 was obturated with gutta-percha and AH Plus sealer. On the other hand, sectional GP was used to obturate the canal up to the base of the resorption site in 21. Flap reflection was done (from 13 to 23) and after bone removal and curettage of the periapical lesion, root end resection was performed in 11. Root end of 11 was prepared with ultrasonics and root end filling was done with MTA. In 21, granulation tissue associated with the resorptive defect was removed with curette. The defect in 21 was repaired with MTA (manipulated according to the manufacture's instruction) after bleeding was arrested properly. Rest of the canal of 21 coronal to the defect was filled with MTA in orthograde manner. Flap was closed and suture was placed. Access cavity was closed with Glass Inomer cement. Patient was discharged with post-surgical instructions and medications. She was recalled after one week for suture removal and teeth were restored with light cured composite. Follow up done after 1 month, 2 months and 6 months post-operatively. After 6 month follow up the teeth were asymptomatic and the IOPA radiograph showed healing. The patient was satisfied because her natural teeth were saved.

Fig 1- Pre-Op Intra oral pic

Fig 2- Preoperative IOPAR

Fig 3- Application of Rubber dam

Fig 4- W/L IOPAR

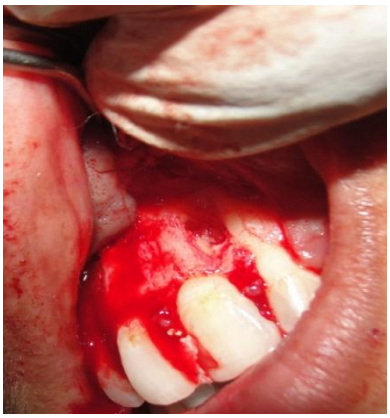

Fig 5- Resorption site after flap reflection

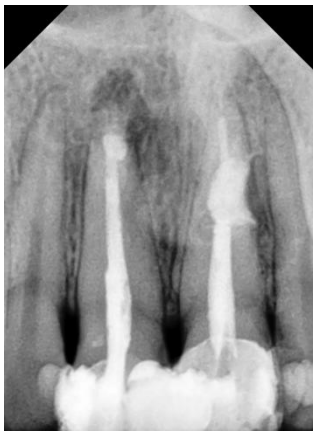

Fig 6- Immediate Post-Op IOPAR

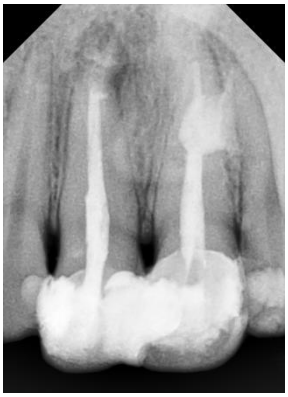

Fig 7- 1 Month Post-Op IOPAR

Fig 8- 6 Month Post-Op IOPAR

III. Discussion

Resorption of calcified dental tissue occurs as a result of process involving the ionic exchange in the local environment due to the change in ph and concomitant lacunar resorption by the dentinoclast cells derived from the inflammatory process[1]. The resorption occurs periodically with the deposition of mineralized structure. Classifications play an important role in diagnosis and treatment planning of the resorptive processes. Andreasen[2] has made a unique contribution to the understanding of tooth resorptions and his classification is widely accepted.

Tooth Resorption- A) Internal- i) Inflammatory
ii) Replacement

B) External- i) Surface
ii) Inflammmatory
iii) Replacement

Another classification is proposed by Lindskoy which subdivides resorption into three [3] broad groups:-

1. Trauma induced resorption :-
   i) Surface resorption
   ii) Transient apical resorption
   iii) Pressure
   iv) Orthodontic
   v) Replacement

2. Infection induced resorption:-
   i) Internal (infective) resorption- a) Apical
   b) Interradicular
   ii) External inflammatory
   iii) Comminuting internal- external resorption

3. Hyperplasic invasive tooth resorption:-
   i) Internal replacement resorption
   ii) Invasive coronal resorption
   iii) Invasive cervical resorption
   iv) Invasive radicular resorption

The occurrence of Internal resorption is very rare (0.01% to 1%)[4]. One study concluded 4 out 1000 teeth[5]. It is more commonly observed in male than female. The most commonly affected teeth are Maxillary Incisors then lower molars. It is most frequently found in the cervical region followed by middle 3rd and apical 3rd of root.

For the resorption to occur the presence of vital pulp tissue is crucial. It is the vital tissue of the pulp which provides the supply of clast cells and the required environment for the resorption to happen. Another important prerequisite is destruction of the predentin layer which results in exposure of underlying dentin to the odontoclast cells. Various etiological factors have been proposed including trauma, caries and periodontal infections, excessive heat generated during restorative procedures on vital teeth, prolonged use of calcium hydroxide etc[3-6,7]. Trauma was reported to be the major etiological factor for contributing 45% of the cases in a study of 25 teeth with IR[8]. Other reports in the literature also support the view that trauma and pulpal inflammation/ infection are the major contributory factors in the initiation of IR[9]. It also had been reported to be occurring along the fracture lines of the apical root fractures and in the apical part of the root where revascularization had been taken place following a luxation injury[10]. Two main patterns are seen: (i) inflammatory resorption, and (ii) replacement or metaplastic resorption. In inflammatory resorption process the dental hard tissue is replaced by the granulation tissue. They can be seen all along the root canal length but most commonly found in the cervical region[11]. Replacement resorption is characterized by the deposition of a bone like tissue on a resorbed dentinal surface.

Clinically internal resorption is asymptomatic and detected by routine radiographs. Pain or discomfort may be the chief complain if the granulation tissue has been exposed to the oral fluids. When the vascular resorptive process removes most of the dentinal layer of the coronal tooth structure, the crown appears pink in color (pink tooth of Mummery, named after the anatomist "James Howard Mummery"). Radiographically, it appears as an oval enlargement (ballooning out) of the root canal space[3].

Histology discloses multinucleated giant cells, osteoclasts, odontoblast and numerous other inflammatory cells.

The differentiation of internal and external resorption is usually based on clinical and radiographic findings. Clinically internal resorption of the cervical third may be misdiagnosed as invasive cervical resorption but it is ruled out by a surface defect while probing the crown. In case of internal root resorption (IR) X-ray shows an enlargement of root canal (ballooning), whereas External root resorption defects are associated with areas of bone rarefaction at the external surface of the root. IR defects are restricted to the pulpal cavity and canals except when they perforate and communicate with the periodontium. While the defects of IR are having a regular margin, the borders of ER defects are irregular and ill defined. The radiolucency in IR is uniform in density but in ER it is irregular. As IR defects are superimposed with the pulpal cavity, the canals or the pulp chambers cannot be followed uninterruptedly, whereas it is possible to trace the unaltered canals in case of ER defects except where they perforate the pulp cavity.

Gartner et al[4] described the radiographic feature of IR and ER by using parallel radiographic technique. A second radiograph taken at a different angulation often confirms the nature of resorption. ER defects will move in the same direction of the x- ray tube shift if they are lingually / palatally positioned. Conversely they will move in opposite direction if they are buccally positioned. IR defects remain in same position relative to the canal in both radiographs.

Cone Beam CT of the involved tooth provides the best diagnostic information and specific location of the defects.

However, once IR has been diagnosed, if the tooth is restorable and has a reasonable prognosis - root canal treatment is the treatment of choice. It is very difficult to clean and shape the root canals associated with the IR owing to the altered morphology of the canal (ballooning), stubbornness of the dentinoclast cells to normal irrigating solutions, presence of the small lacunae at the resorption site harboring odontoclasts and inflammatory cells (difficult to access area for chemo-mechanical preparation methods). Access cavity should be as conservative as possible as there is an increased chance of post operative root fracture due to the loss of tooth structure. Mechanical instrumentation with copious irrigation with activation should be done.

Obturation of the canal should be done with warm thermoplasticised gutta-percha technique. In hybrid method the canal apical to the resorption site is obturated with sectional technique and the rest of the canal along with the defect obdurated with the warm thermoplasticised technique is gaining popularity.

When a resorptive defect communicates with the external root surface or a perforation occurs a combination of non surgical and surgical approach is required[12]. Using MTA to repair the resorption site and filling the rest of the coronal canal bears the best prognosis. MTA is known as a biocompatible material that may induce cementum formation when applied to perforations and when used as a root end filling. It can function in the presence of moisture and inhibits the activity of bacteria[13]. The MTA also provides structure and strength to the tooth by replacing the resorbed tooth structure.

The prognosis of teeth with internal root resorption depends on the size, location, presence of communication with external root surface and the material used to repair the lesion. Large lesions cause a reduction in the resistance of the tooth to shear forces that may lead to tooth fracture. Therefore, early detection and initiation of endodontic treatment is necessary for long term survival and prevention of root fracture[14].

IV. Conclusion

Internal Root resorption is a complex pathological process which is very difficult to predict and control. Modern dental materials and instruments with superior qualities made the treatment of such cases a predictable one.

Bibliography

[1]. Tronstad L : Root Resorption – Etiology, Treminology and clinical manifestations. Endod Dent Traumatol 4:241,1988
[2]. Rabinowitch BZ. Internal resorption. *Oral Surg Oral Med Oral Pathol*1972;33:263–282.
[3]. Silveria FF, Nunes E, Soares JA, Ferreria CL, Rotstein I. Double 'pink tooth' associated with extensive internal root resorption after orthodontic treatment: a case report. *Dent Traumatol*2009;25:43–47.
[4]. Ashrafi MH, Sadeghi EM. Idiopathic multiple internal resorptions: report of case. *ASDC J Dent Child* 1980;47:196–199.
[5]. Brady J, Lewis DH. Internal resorption complicating orthodontic tooth movement. *Br J Orthod*1984;11:155–157.
[6]. Brooks JK. An unusual case of idiopathic internal root resorption beginning in an unerupted permanent tooth. *J Endod*1986;12:309–310.
[7]. Andreasen JO. Luxation of permanent teeth due to trauma: a clinical and radiographic follow up study of 189 injured teeth. *Scand J Dent Res* 1970;19:273–286.
[8]. Calis¸ Kan MK, Türkün M. Prognosis of permanent teeth with internal resorption: a clinical review. *Endod Dent Traumatol*1997;13:75–81.
[9]. Patel S, Ricucci D, Durak C, Tay F. Internal root resorption: a review. *J Endod*2010;36:1107–1121.
[10]. Andreasen FM, Andreasen Jo. Resorption and mineralization process following root fracture of permanent incisors. 1988;4:202-14
[11]. Neville BW, Damn DD, Allen CM, Bouquot JE. *Oral and Maxillofacial Pathology* 2nd ed. Philadelphia: WB Saunders, 1995.

[12]. Gerald N, Glickman, Gary R Hartwell. Endodontic Surgery: *Ingle's Endodontics 6*.2008:1275
[13]. Parirokh M, Torabinejad M. Mineral trioxide aggregate: a comprehensive literature review--Part I: chemical, physical, and antibacterial properties. *J Endod.* 2010;36(1):16–27.
[14]. David keinan, IllanHeling et al: Rapidly progressive internal root resorption: a case report: *Dental Traumatology,* 2008; 24:546,

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