ENDODONTIC MANAGEMENT OF INTERNAL RESORPTIVE DEFECT IN MAXILLARY CENTRAL INCISOR: A CASE REPORT

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ABSTRACT:

Internal resorption is a form of tooth resorption that begins at any point of pulp chamber or root canal and produce an irregular progressive removal of tooth structure. Radiographically, the lesion appears as a uniform, round-to-oval radiolucent enlargement of the pulp space. This case report presents a rare case of resorption in the middle third of pulp space in maxillary right central incisor.

KEY WORDS: Dental trauma, Internal resorption, Maxillary central incisor

INTRODUCTION

Internal inflammatory root resorption is a rare condition in permanent teeth¹, appearing as typical dystrophy of the pulp which jeopardize the hard tissue of the teeth changing its normal morphology². Its etiology is not much clarified, however, can be associated with dental trauma and inflammatory alterations of dental pulp after pulp capping or pulpotomy.

Kinomoto *et al* ³ in 2002 adds that it can also happen due to the infection of dental pulp or extreme heat. These annoying facts stimulate the pulp tissue, thus the inflammatory process starts and then some undifferentiated cells of the pulp can convert themselves to osteoclasts or macrophages, which results in dentinal resorption. In the majority of the cases, the internal resorption usually is asymptomatic and only detectable by routine radiographs ^{4,6}.

Radiographically it is described as a radiolucent area characterized by an oval-shaped enlargement of the root canal, showing many times the appearance of an ampoule⁵ and which does not move with variations of radiographic angle⁶. The margins are smooth and clearly defined, with distortion of the original root canal outline⁷. In more evolved cases, the fragility of the dental structure can cause areas of fracture or perforation.

The treatment of the resorptions is complex, it demands time, is expensive and its prognosis is unpredictable. One of the reasons that make its prognosis difficult is related to the fact that the periapical radiography emphasizes the observation of two dimensions only and the visibility of its length and location is limited 4 .

Case report:

A 23-year-old male patient reported to the Department of Conservative dentistry and Endodontics of the Institute of Dental sciences, Bareilly with a complaint of pain and pus discharge in relation to upper front teeth region since 4 weeks. He gave history of trauma 10 years back. Medical history was non-contributory. On examination 11 was found to be fractured. Pus discharging sinus was present on the labial aspect of 11, and tooth was tender on percussion. Thermal and electrical pulp testing elicited a negative response in the right maxillary central incisor.

Radiographic examination revealed periapical radiolucency in relation to 11. A radiolucent area was noticed on the middle one third of root canal space of right maxillary central incisor. Based on radiographic findings, the lesion was diagnosed as internal resorption, and root canal therapy was initiated. The tooth was isolated under rubber dam and accessed with local anaesthesia with1:1,00,000 epinephrine. Working length was determined using radiographs (Ingle's method) and an apex locator. Cleaning and shaping was done using crown-down technique with Ni-Ti rotary instrumentation (protaper, dentsply). Irrigation between each instrument was done using normal saline and 3% Sodium Hypochlorite solution.

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Fig. 1. Preoperative photograph showing sinus opening in relation to 11



Fig.3. Estimation of Working Length

Fig. 2. Preoperative radiograph showing internal resorption in 11



Fig.4. Master cone Guttapercha.



Fig.5. Obturation done with lateral Cold condensation Thermoplasticised Gutta percha





Fig. 6. Postoperative photograph

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Intracanal medicament (calcium hydroxide) was placed in pulp space because the granulation tissue could not be removed completely by mechanical instrumentation. Hasselgren in 1988, adds that the tissue dissolving effect of sodium hypochlorite can be increased by pretreatment of tissue with calcium hydroxide⁸.

In second visit Metapex paste (calcium hydroxide and iodoform) was placed for 2 weeks. In a third office visit 2 weeks later, the resorptive cavity was completely free of pulpal tissue. Pulp space was obturated with thermoplastic gutta percha and AH plus sealer (Dentsply) using E & Q plus system (Meta Biomed co.,Ltd, Koreas) and 12 was obturated with cold lateral compaction of gutta percha technique and zinc oxide eugenol based sealer. subsequently access cavity and coronal structure is restored with composite.

Discussion

The lesion in this case was diagnosed as internal resorption. It is defined as a pathological process initiated within the pulp space with loss of dentin. Its diagnosis was based on radiographic examination (clearly defined margins, uniform density, and root canal walls appear to balloon out) and clinical (inability to probe the defect via the periodontal ligament) features. It can be found in all areas of the root canal but is most commonly found in the cervical region⁹.

Unlike deciduous teeth, permanent teeth rarely undergo root resorption. Even in the presence of peri-radicular inflammation, resorption will occur primarily on the bone side of the attachment apparatus and the root will be resistant to it. Although many theories have been put forward, the reason for the resistance of the root to resorption is not fully understood.

One theory maintains that the cementum and predentin covering on dentin are essential elements in the resistance of the dental root to resorption. It has long been noted that osteoclasts will not adhere to or resorb unmineralized matrix. Major mediators of osteoclast binding are RGD-peptides that are bound to calcium salt crystals on mineralized surfaces. Since the most external aspect of cementum is covered by a layer of cementoblasts over a zone of non-mineralized cementoid, a surface that provides satisfactory conditions for Inflammatory resorption is characterized by the transformation of normal pulp tissue into granulomatous tissue. The internal root resorption

osteoclast binding is not present. Internally, the dentin is covered by predentin matrix, which possesses a similar organic surface. Another function of the cemental layer is related to its ability to inhibit the movement of toxins if present in the root canal space into the surrounding periodontal tissues. The consequence of an infected root canal space is, therefore, most likely to be apical periodontitis, as the toxins can only communicate with the periodontal tissues through the apical foramina or large accessory canals. However, if the cemental layer is lost or damaged, the inflammatory stimulators can pass from an infected pulp space through the dentinal tubules into the surrounding periodontal ligament, which, in turn, sets up an inflammatory response. Since the cementum is lost, this inflammatory response will result in both bone resorption and root resorption.

The resorptive process if progressing unnoticed perforates the root and may result in fracture of the tooth¹⁰. Graham in 1972¹¹ showed that early diagnosis of internal resorption is essential for successful endodontic therapy.

There are four basic diagnostic methods of internal resorption:

- visual examination based on the changed color in tooth crown
- Radiographic diagnosis
- light microscopy
- electron microscopy

Light microscopy shows different levels of inflammation of the pulpal tissue with infiltration of predominant lympocytes, macrophages and some leukocytes, dilated blood vessels and multinucear dentinoclasts in resorptive lacunae on the pulpal-dentin surface.

Electron microscopy shows the pulpal-dentin wall without odontoblasts. Dentinoclasts, large in number, have size of 50 µm and with numerous philopods are turned toward dentin surface and attached to it.

Two types of internal root resorption; internal replacement resorption and internal inflammatory resorption, have been described by Andreasen (1981). The internal replacement resorption is characterized by metaplasia of the normal pulp tissue into cancellous bone-like tissue. The internal resolves with root canal treatment because the resorbing cells will no longer have the blood supply to survive.

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CONCLUSION: By this we have concluded the importance of clinical and radiographic examination, because early the diagnosis of internal root resorptions more effective will be the treatment and better prognosis.

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