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RESEARCH ARTICLE

INTERNAL RESORPTION: AN ENDODONTIC DOGMA: A CASE REPORT.

Dr. Nachiket Patel, Dr. Kiran Vachhani, Dr. Kamal Bagda, Dr. Kailash Attur, Dr. Dhruvin Desai and Dr. Zarna Patel.

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Abstract:

Internal resorption, a rare phenomenon, has been a quandary from the stand points of both its diagnosis and treatment. It is usually asymptomatic and discovered by chance on routine radiographic examinations or by a classic clinical sign, “pink spot” in the crown. It may occur in cases with chronic pulpal inflammation, following caries or due to trauma in the form of an accidental blow. It is important to diagnose this condition and institute treatment as early as possible to improve the prognosis of such teeth. This paper presents a case having resorptive defect in the coronal 1/3rd which was treated non-surgically. A six month follow-up showed good prognosis.

Introduction:-

Internal root resorption is the progressive destruction of intraradicular dentin and dentinal tubules along the middle and apical thirds of the canal walls as a result of clastic activities. Internal resorption (IR) is a rare, insidious, resorptive pathological process, beginning in the pulpal space and extending into the surrounding dentin.

Internal resorption was first reported by Bell in 1830. Pink tooth of Mummery (1920), so called due to the presence of a pink discoloration on the crown, is named after the anatomist Mummery.[1]

It is caused by transformation of normal pulp tissue into granulomatous tissue with giant cells, which resorb dentin. This transformation is thought to stem from chronic inflammation of the coronal pulp caused by continuous bacterial stimulation. Trauma, caries and restorative procedures have been suggested to be contributing factors, but it also occurs as an idiopathic dystrophic changes.[2]

Clinically, internal root resorption is usually asymptomatic and is detected coincidentally through routine radiographs. Pain or discomfort may be the chief complaint if the granulation tissue has been exposed to oral fluids. The granulation tissue can clinically manifest itself as a ‘‘pink spot’’ in cases in which crown dentin destruction is severe. Radiographic examination usually reveals a fairly uniform radiolucent area with disrupted outline of the root canal. The progression of internal resorption depends on vital tissues.[3]

In cases without a perforation, the removal of the granulation tissue and severing the blood supply to the resorbing cells by root canal treatment should be sufficient. However, in cases in which a pathway between the pulp canal space and the periodontal tissues is present, root canal treatment should be followed by repair of the perforation site with a suitable sealing material.[3]

Corresponding Author:- Nachiket Patel.

There are three basic diagnostic methods of internal resorption:-

1. Visual examination based on the changed color in tooth crown
2. Conventional radiography and Cone beam computer tomography
3. Light microscopy
4. Electron microscopy [4]

Teeth in which resorptive process reaches cervical area of the crown may have a pinkish color, known as 'pink tooth' resulting from granulation tissue ingrowth.

A radiograph of the affected tooth usually shows an oval enlargement (ballooning out) of the root canal space. The pulp chamber and canal cannot be followed throughout the lesion. Radiograph performed at different angulation confirms that the resorptive lacunae is in a continuation of the distorted border of the root canal.

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

Electron microscope shows the pulpal-dentin wall without odontoblasts. Dentinoclasts, large in number, have size of 50μm and with numerous philopods are turned towards dentin surface and attached to it.[3]

Case Report:-

A 32 years old asymptomatic male patient came to the department of conservative dentistry and endodontics with a chief complaint of discoloration of upper front teeth. Patient had previous history of trauma before 20 years.

Clinical examination showed Ellis class II fracture in maxillary right central incisor and Ellis class III fracture in maxillary left central incisor. Pinkish hue was evident on left maxillary central incisor.

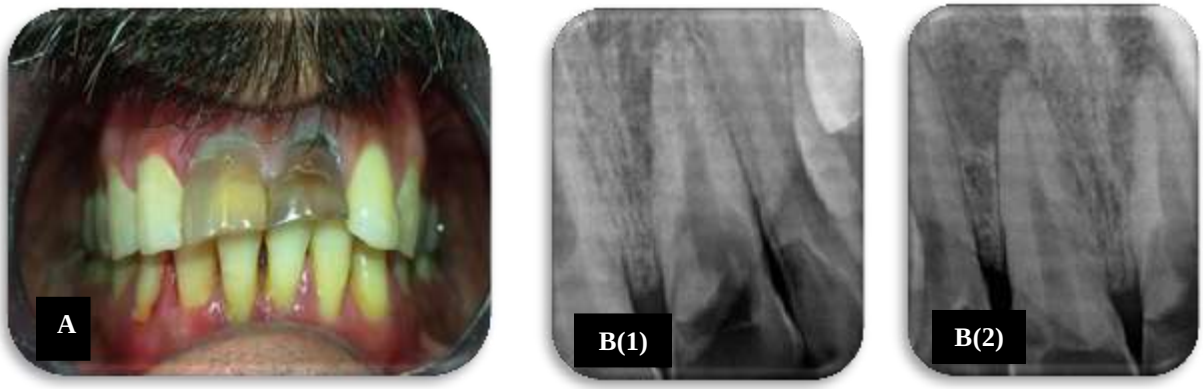

Fig A:- Preoperative clinical photo showed Ellis class-II fracture i.r.t .11 and Ellis class-III fracture i.r.t 21 along with pinkish hue i.r.t. 21.
Fig B1:- Radiograph showed resorptive defect and periapical lesion i.r.t. 21.
Fig.B2:- Radiograph showed periapical radiolucency i.r.t. 11.

On vitality both 11 and 21 were found to be non vital. On radiographic examination resorptive defect was present in coronal third of root canal of 21.Periapical radiolucency was evident i.r.t. 11 and 21.IOPA radiograph of 21 showed immature tooth with wide open apex and radiolucent area in the apical region.

Root canal treatment was accomplished by established methods. The tooth was isolated with a rubber dam. After working length determination; the canal was prepared by Hyflex CM (Colténe, Switzerland) file systems. An apical stop was created with a rotary nickel–titanium size 60, .04 Hyflex CM file. This was accompanied by copious irrigation with 3% sodium hypochlorite & normal saline and a calcium hydroxide paste dressing was placed to alkalinize the environment and remove remaining pulp tissue.

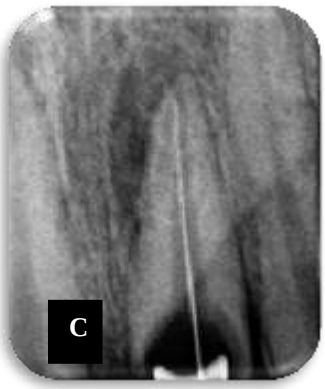

Fig C:- Radiographic verification of working length

Fig D:- $Ca(OH)_2$ was placed in root canal

After 7 days, the dressing material was removed with 3% sodium hypochlorite, followed by normal saline irrigation and aspiration. After the canal was dried, metapex syringe was inserted into canal and material was injected in canal. The completed root canal filling with metapex was verified radiographically.

Fig E:- Metapex was placed in canal

Patient was recalled after 1 month. On next visit, radiograph showed reduction in periapical radiolucency i.r.t 21.Metapex was removed with copious irrigation with 3% sodium hypochlorite, H file and ultrasonic tips. Canal was being dried by sterile paper points.

As the root apex was wide, MTA plug in the apical third was placed. For that, MTA (Pro-Root MTA, Dentsply Maillefer, Ballaigues Switzerland) was mixed according to manufacturer's instructions and was placed with a small MTA carrier to the canal orifice. The MTA mixture was then adapted to the canal walls using a thick gutta-percha cone which was tightened 4 millimeters shorter than the working length. The correct position of the MTA mixture was controlled with a periapical radiograph. A wet sterile cotton pellet was then placed in the coronal part of the root canal and access cavity was closed with a temporary filling material for the setting of the MTA.

Fig F:- Removal of metapex from 21 after 1 month. Radiograph showed reduction in periapical radiolucency.
Fig G:- Obturation i.r.t. 11 and Apical plug of MTA i.r.t. 21

The temporary filling material and paper point was removed after two days and the set of the MTA was gently tested. The rest of the canal was obturated with warm vertical compaction of gutta-percha in association with a root canal sealer sealapex till the resorptive defect. As there wasn't any perforation or communication between canal dentine and periodontium, defect was filled with hybrid composite. Both teeth 11 and 21 were prosthetically rehabilitated with ultra-T Zirconia Crowns.

Fig H:- Obturation with warm vertical compaction and resorptive defect filled with hybrid composite i.r.t. 21.
Fig I:- Post Operative photograph after FCC i.r.t. 11, 21.

A six-month follow up demonstrated clinically asymptomatic and adequately functional tooth, with radiographic signs of healing.

Fig J:- Six month follow up radioograph

Discussion:-

Internal inflammatory root resorption is a rare, insidious pathological process, initiated within the pulp space and associated with loss of dentine. Haapasalo suggested a prevalence of 0.01%–1% for internal root resorption occurring due to inflammatory causes.[1] 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.[5]

In teeth with perforating defects, remineralization of the defect may occur, formation of hard tissue matrix can occur with the help of bioactive materials, against which permanent root canal filling is condensed. In this case, the defect was non-perforating, so it was filled with composite resin and root canal was filled with warm vertical compaction.[6,7]

The difficulty in cleaning the concavity of resorption area requests a cleaning with chemical substances that have an appropriate organic solvent capacity. The endodontic instrumentation of that resorption area can cause a communication with the periodontium that could complicate the prognosis. Complementing the action of the sodium hypochlorite, we used the intracanal medication with calcium hydroxide for a prolonged period. The use of a calcium hydroxide-based sealer would allow the alkalinity maintenance, preventing a resorption recurrence.[8]

In teeth with a large resorption cavity in the coronal third of the root canal, use of composite materials should be considered in order to strengthen the tooth and to make it more resistant to tooth fracture.[9,10]

Conclusion:-

Internal inflammatory resorption is an uncommon resorption of the tooth which starts from the root canal and destroys the surrounding tooth structure. Odontoclast cells which are responsible for the resorption are structurally and functionally similar to bone osteoclasts. It is easy to control the process of internal root resorption via severing the blood supply to the resorbing tissues with conventional root canal therapy. With proper treatment and use of modern endodontic techniques and materials, the prognosis of even perforated cases is fairly good.

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