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Surgical management of Calcific metamorphosis: A Case Report

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Abstract:
Internal resorption is a condition associated with either physiologic or pathologic process resulting in loss of dentine cementum and bone.
The course of tooth resorption involves elaborate interaction among inflammatory cells,resorbing cells and hard tissue structure.
The key cells involved in resorption are of the classic type, which includes osteoblasts ad odontoblasts.
This report will focus on internal resorption.
Keywords: *Inflammatory cells, odontoblasts, osteoblasts, resorbing cells.*

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I. Introduction-

Calcific metamorphosis (CM) is seen commonly in the dental pulp after traumatic tooth injuries and is recognized clinically as early as 3 months after injury.

Calcific metamorphosis is characterized by deposition of hard tissue within the root canal space and yellow discoloration of the clinical crown.

The clinical picture of Calcific Metamorphosis has been described by Patterson and Mitchell as a tooth that is darker in hue than the adjacent teeth, and exhibits a dark yellow color because of a decrease in translucency from a greater thickness of dentin under the enamel.[1]

The exact mechanism of canal obliteration is unknown but is believed to be related to damage to the neurovascular supply of the pulp at the time of injury (Yaacob& Hamid 1986, Robertson 1998).[2]

Calcific Metamorphosis is seen most frequently in the anterior teeth. It is characterized by anosteoid tissue that is produced by the odontoblasts at the periphery of the pulp space or canbe produced by undifferentiated pulpal cells that undergo differentiation as a result of the traumatic injury.

This results in a simultaneous deposition of a dentin-like tissue along the periphery of the pulp space (root canal walls) and within the pulp space proper (root canal). These tissues can eventually fuse with one another, producing the radiographic appearance of a root canal space that has become rapidly completely calcified. Pulp vitality tests are unreliable in case of teeth exhibiting calacific metamorphosis. There is a progressive decrease in the response to thermal and electrical pulp testing as pulp canal obliteration becomes more pronounced. Teeth undergoing pulpal obliteration are generally asymptomatic .

It has been reported that 52%of teeth were asymptomatic when first examined with a further 21% exhibiting mild symptoms on routine and clinical examination.

The incidence of pulp obliteration after subluxation injuries is marginally higher; obliteration took place in 11% of teeth with immature roots and 8% of teeth with completely formed roots (Andreasen et al. 1987). After more accentuated luxation injuries, e.g. intruded, extruded, and laterally luxated teeth, both pulpal necrosis and pulpal obliteration are encountered more frequently (Andreasen et al. 1987).

In these cases, pulpal necrosis occurs more often in teeth with complete root formation (Andreasen&Vestergaard Pedersen 1985), and pulp obliteration is more prevalent in teeth that have immature roots at the time of injury (Andreasen et al.1987).

II. Case Report

A 21 year old female patient reported to Department of Conservative dentistry & endodontics with a chief complaint of pain and slight mobility in relation to her upper anterior teeth region. The patient gave a

history of trauma 3 years back in upper anterior teeth. The patient was asymptomatic during this period butstarted developing pain in relation to 21 over a duration of last one week.

The clinical examination revealed discolored tooth with sinus opening in relation to 21. A negative response was elicited with both heat and electric pulp test for involved tooth while the response was normal in adjacent teeth. The radiographic examination revealed completely obliterated pulp chamber and canal in 21 with periapical radiolucency. On the basis of history and radiographic examination, it was evident that this was a case of calcific metamorphosis.

III. Management:-

A non surgical endodontic intervention was initially planned for the management. A standard access was done exact centre of palatal surface of crown buccolingually and incisogingivally by penetrating the bur for 3-4 mm at an angle of roughly 45 degree to the long access of the tooth.

However in this case as pulp chamber was completely calcified after reaching a depth of 4mm ,the bur was rotated as parallel to long access of tooth as possible to prevent perforation.

After performing conventional endodontic treatment, the canal with calcific metamorphosis could not be negotiated with endodontic files so we planned for periapical curettage.

During the surgical procedure trapezoidal flap was raised and curettage was done i.r.t 21.Following the surgical procedure ,interrupted sutures were placed.

Preoperative

Incision given

Trapezoidal flap is raised

Cavity prepared irt 21

Curettage done irt 21.

Suture placed.

IV. Discussion

After primary or permanent teeth have been traumatized, two common pathologic pulpal sequelae are either calcific metamorphosis or internal resorption[3]. Calcific metamorphosis is probably initiated by a stimulation of odontoblastic activity.[4]Internal resorption is probably initiated by stimulation of odontoclastic activity.[5]

Generally, if one of these processes begins and is left untreated, the course of events will continue.[6,7] In this particular case, a complete reversal occurred. The cause of this reversal is not clearly understood.

One possibility is that since the parent cells for odontoblasts and odontoclasts may be from the same undifferentiated mesenchymal stock, the odontoblasts idiopathically develop into odontoclasts.[8,9] Another possibility is that subsequent to the initial trauma which caused the calcific metamorphosis, the patient retraumatized the tooth which then stimulated odontoclastic activity.[10]

V. Conclusion

A case of a central incisor exhibiting calcific metamorphosis reversing and undergoing internal resorption is presented. The tooth was diagnosed as undergoing calcific metamorphosis secondary to a traumatic injury. Calcific metamorphosis cases are great challenge to the clinician and its diagnosis and treatment procedure is utmost important in providing best treatment.this article highlights the surgical management of the partial obliteration of the pulp chamber.

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