Non Surgical Management of Complex Resorption in a Mandibular Second Molar – A Case Report

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ABSTRACT:

In practice, clinicians are beset with a plethora of conditions such as inadvertent or traumatic pulp exposures, root perforations, open apices, root resorption defects etc that require immediate and optimum management. One of the major impediments to this has been the need for moisture control which is notoriously difficult to achieve. However, the introduction of MTA has proven to be a significant addition to our repertoire and a possible solution to all these challenges. When diagnostic criteria are chosen correctly and treatment protocol stringently employed, predictable and durable positive outcomes can be produced. This article describes a case wherein MTA has been employed in treating a case of internal root resorption combined with external apical resorption successfully.

Keywords: Complex Resorption, Mandibular Second Molar, Non Surgical Management.

INTRODUCTION

Resorption is the process of removal of cementum and /or dentin through physiological or pathological activity of tooth resorbing cells, odontoclasts.[1] Root resorption may occur due to various injuries, including mechanical, chemical, or thermal injury. Generally, it can be classified as internal or external root resorption. Internal root resorptionis a rare condition, usually asymptomatic and is detected in routine radiographic examination[2]. It is caused by transformation of normal pulp tissue into granulomatous tissue with giant cells, which resorb dentin.[3]

Radiographically, internal resorptionappears as a uniform, round-to-oval radiolucent enlargement of the pulp space. The margins are smooth and clearly defined, with distortion of the original root canal outline[4]. If the internal resorption involves the crown, usually associated with a pink area, referred to as a "pink spot"[5].Outer surface of the root may be affected by external root resorption, and the causes for this may be numerous. There are several types of external root resorption with the most common being external inflammatory root resorption. It usually occurs as a sequela of traumatic injury, orthodontic tooth movement, or chronic infection of the pulp or periodontal structures.

Internal resorption occurs only when there is presence of vital pulp tissue. Therefore, nonsurgical root canal therapy (pulp removal) is the treatment of choice to arrest the resorptive process[6]. The irregular internal anatomy of the resorptive cavity causes practical difficulties for thorough debridement and obturation of the pulp space as the access to these lacunaes are always arduous. If the internal resorption has extended to the point that it communicates with the external root surface, there is loss of root integrity and destruction of the adjacent periodontium.

Selection of the suitable restorative material for cases of root resorption continues to be a challenge, especially if there is extensive tooth loss. Various biomaterials have been used for root resorption, among them, MTA has gained popularity due to its biocompatibility, potential to induce osteogenesis and cementogenesis,[7] sealing capacity superior to that of other materials, mechanical strength,[7] capacity to promote healing of the peri-

radicular tissues, bactericidal activity, capacity for adhesion in the presence of blood,[8] radiopacity, resistance to humidity,[9] in addition to being well tolerated by the tissues. Common indications of MTA are root-end filling, pulp capping, apical filling of teeth with open apices, apexification therapy, and repair of root perforations.[10] Thus, MTA stands as suitable candidate for the management of root resorptionas it plays a crucial role in regenerating a periodontal attachment and inducing osteogenesis and cementogenesis.

CASE REPORT

A 16 year old boy reported to our department with occasional pain and swelling in relation to lower left back tooth. Pain and swelling disappears on taking medication. Lower left first molar was extracted at 9 years of age. History of orthodontic treatment at 13 years of age.

Clinical examination revealed missing 36 and a small, tender, swelling in relation to 37(Figure 1). 37 was intact with no obvious carious lesion. On periodontal probing pocket depth was also normal. All teeth in this quadrant responded normally to cold and electric pulp testing except 37, which was unresponsive. The medical history was noncontributory.

Radiographic examination revealed radiolucency in the mesial and distal root canal suggestive of internal resorptionand shortened mesial root with tooth structure loss indicating external inflammatory resorption. Also there was radiolucency in the furcation area (Figure 2). GP tracing through the swelling pointed onto the lesion on the furcation area.(Figure 3)

Based on the radiographic findings, the lesion was diagnosed as symptomatic apical periodontitis with internal and external root resorptionand root canal therapy was initiated. Tooth was isolated using rubberdam under local anesthesia (2% lignocaine with 1:200000 adrenaline, Kwality pharmaceuticals Pvt.ltd, India). Access opening was done under dental operating microscope (Seiler, USA). Upon opening the pulp chamber there was granulation tissue which caused excessive bleeding. Dry calcium hydroxide powder was used to control the bleeding. In order to clean the canal sodium hypochlorite with ultrasonic system was used.

Canal was medicated with calcium hydroxide for two weeks because the granulation tissue could not be removed completely by mechanical instrumentation. It also alkalinizes the outer root dentin which counteract acid environment for resorption. The calcium hydroxide paste was changed 2 weeks later. After 3 weeks obturation was done. Mesial canal obturated with MTA using MTA carrier and distal canal with thermoplasticized guttapercha by warm vertical condensation (Touch n Heat) (Figure 4). The cavity was temporized for one day for the MTA to set. After one day composite was given as the permanent filling.

Figure 1

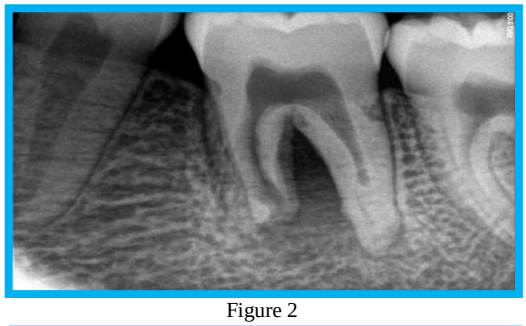

Figure 2

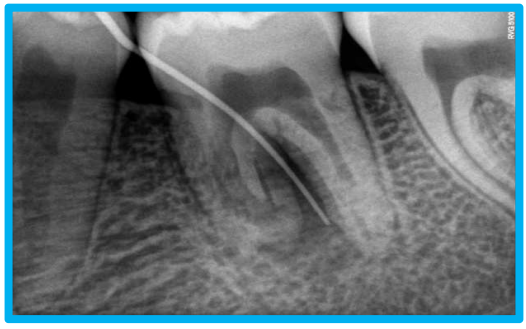

Figure 3

Figure 4

The patient was recalled after 6 months and the tooth was found to be asymptomatic. No percussion pain was observed, and the patient had a healthy gingiva with no periodontal pockets on probing. The periapical radiograph revealed satisfactory healing of the mesial and furcalradiolucency(Figure 5).

At a 2-year follow-up visit, the tooth was still symptom free (Figure 6). There was no percussion or palpation sensitivity, and periodontal probing was within the normal limits.

Figure 5

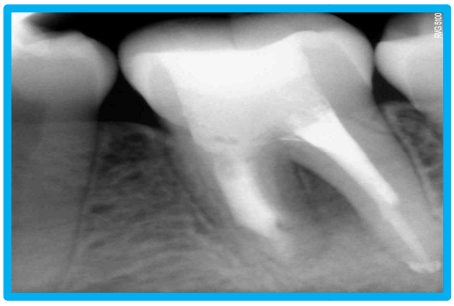

Figure 6

DISCUSSION

Although theetiopathogenesisof the lesion in this case have still not been completely elucidated, it was diagnosed as internal resorption combined with external apical resorption. Also there was furcation radiolucency. This diagnosis was based on radiographic examination. Among the numerous etiological factors, orthodontic movement contributes to internal resorptionby causing some alterations in the dentin-pulp complex, such as interruption of the odontoblast layer, alteration in the microcirculation of the pulp and hypoxia. There are many treatment options such as extraction followed by implant or prosthesis, surgical treatment, conventional root canal treatment, biodentine/MTA obturation.

After the confirmatory diagnosis of internal root resorption, the treatment must be started rapidly, with the objective of removing all stimulatory factors of resorptive cells such as any vital remnant of apical tissue and necrotic coronal portion of the pulp, which may act as a means of their blood supply.

We choose MTA as the obturating material for resorptive canal. MTA provided good sealing of the defect, subsequently allowing a conventional root canal–filling technique. More importantly, the biologic response to this material was excellent, and complete healing of the lesion had been ensued by the time of a 2 years follow-up visit. Also it has been shown that MTA stimulates the propagation of human osteoblasts by offering a biologically active substrate for the cells.

During the management of teeth with internal root resorption, excessive bleeding due to the presence of a partially vital pulp tissue, visualization of access to the canal may be obscured. By means of irrigation with sodium hypochlorite, a reduction in bleeding, thus facilitating visualization of, and access to the canal. Calcium hydroxide may also help in controllingthe bleeding.

The surgical operation microscope was believed to be a very valuable tool in managing this nonsurgical perforation repair. The magnification and illumination allowed good assessment of the cleanliness of the resorptive cavity and proper placement of the repair material.

CONCLUSION

Complete pathogenesis of resorption is still unclear. But early diagnosis, removal of the cause and proper treatment gives a successful outcome. The case presented here was

successful with the absence of clinical as well as radiographic symptoms. There was evidence of healing of the radiolucency in the alveolar bone and a continued absence of pathologic features.

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