Abstract

External cervical resorption (ECR) is the loss of dental hard tissue as a result of odontoclastic action; it usually begins on the cervical region of the root surface of the teeth. The exact cause of ECR is poorly understood. Several etiologic factors have been suggested that might damage the cervical region of the root surface and therefore initiate ECR. These include dental trauma, orthodontic treatment, intracoronal bleaching, periodontal therapy and idiopathic etiology.

Keywords: Resorption, External Resorption & MTA

Introduction

Root resorption is the loss of hard dental tissue (ie, cementum and dentin) as a result of odontoclastic action. Root resorption might be classified by its location in relation to the root surface, ie, internal or external resorption. External root resorption can be further classified into surface resorption, external inflammatory resorption, external replacement resorption, external cervical resorption, and transient apical breakdown.

One of the least understood of the types of external resorption is external cervical resorption (ECR). This form of external resorption has been described at length by Heithersay [25], who preferred the term invasive cervical resorption, which describes its invasive and aggressive nature. Other terms used to describe ECR include odontoclastoma [6], peripheral cervical resorption [7], extracanal invasive resorption [8], suprastructure extracanal invasive resorption [9], peripheral inflammatory root resorption [10], and subepithelial external root resorption [11]. ECR usually occurs immediately below the epithelial attachment of the tooth at the cervical region [1, 2, 12]. ECR defects can be difficult to diagnose and manage.

Case Report

A 28-year old male patient presented to the Department Of Conservative Dentistry And Endodontics with pain in upper maxillary anterior region. The patient reported on taking history a traumatic injury to his front tooth 6 years back. At that time 11 was luxated and was replanted in to the socket using splint. On clinical examination, there was grade I mobility in maxillary right and left central incisor and crown fracture for both 11 and 21 (Fig.-1). Radiographic examination showed a well-defined radiolucency around the apex of maxillary right and left central incisor and resorption in relation to 11 (Fig.-2). The maxillary right and left central incisor were tested for vitality by using thermal and electric pulp tests and both were found to be nonvital.

Management

The access opening was made on the palatal side of the maxillary right and left central incisor. The canal was instrumented cautiously with K- files (and irrigated slowly with 5ml of 0.9% normal saline as a final rinse). The canal was dried with sterile paper points and root canal was obturated with gutta percha and root canal sealer by lateral condensation technique (Fig.-3).

After that surgical management of external resorption was carried out. During the surgical procedure, a full thickness labial periosteal flap was reflected by...
sulcular incision starting from distal of 12 to the distal of 22 and finally vertical incision was given on both sides (Fig. 4). Loss of labial cortical plate was visible at the labial aspect of 21 and proximal surface of 11. Extent of external resorption was probed by using probe (Fig.- 5). Granulation tissue in relation to 11 and 21 was curetted. After removal of granulation tissue, root resection for both central incisors was done (Fig.- 6). Retropreparation was carried for both 11 and 21 and finally retrofilling was done using MTA. (The management of external resorption was done by using MTA) (Fig.- 7,8). Then, the bone graft was placed in the bony defect (Fig. - 9). In order to cover the facial defect, collagen membrane was put over the defect. Finally, the flap was repositioned and sutured.

Discussion

ECR is a recognized complication of luxation and avulsion injuries (3, 11). Heithersay (3) confirmed that dental trauma was a major potential predisposing factor (15.1% of teeth). This increased to 25.7% of teeth when other contributory factors (for example, intracoronal bleaching, orthodontic treatment) were included. Bleaching was an associated factor in 7.4% of all ECR cases with a history of trauma. Maxillary central incisors were the teeth most frequently traumatized that subsequently developed ECR as per the studies. This is due to their location in the dental arch and associated susceptibility to trauma [13, 14].

Dental trauma might cause ECR indirectly. Intruded primary incisors might cause developmental defects in the cervical region of the unerupted permanent successor teeth as a result of direct trauma of the root apices on the unerupted successor. The use of splints (especially interdental wiring) might also potentially damage the cementoenamel junction and therefore predispose to ECR [4].

As its name suggests, ECR is usually found at the cervical region of the tooth. A pink spot in the cervical region of the tooth is usually the clinical sign noticed by the patient and/or dentist that brings the problem to light. This discoloration is a result of the highly vascular granulation (resorptive) tissue within the tooth becoming visible through the thinned out (resorbed) dentin and translucent overlying enamel (1). If there is no pink spot indicating ECR, then the condition might go unnoticed until there is pulpal and/or periodontal involvement, because these lesions are usually painless.

It is important to differentiate ECR from subgingival caries, which feel sticky on probing. The base of an ECR defect will feel hard and also result in a scraping sound when probed [15]. Probing the ECR defect and/or the associated periodontal pocket will cause profuse bleeding of the underlying highly vascular resorptive tissue [16]. Once the granulation tissue has been removed from an ECR lesion, the cavity walls are felt hard and mineralized on probing. The edges of the cavity usually appear sharp and narrow.

The outline of the root canal are visible and intact, indicating that the lesion lies on the outer surface of the root. With more advanced lesions, the lesion tends to balloon out within the root in all directions; this will also be reflected in the size and position of the radiolucency detected on the radiograph. The lesion might involve the adjacent alveolus, resulting in a radiographic appearance of an intrabony defect [16, 17].

The parallax technique is useful to follow the continuity of the pulp canal and to distinguish between internal and external resorption. With internal resorption, the defect remains centered on the root canal system regardless of the angle of the radiograph exposure, whereas with ECR the defect will either move in the same (lingual/palatal) or in the opposite to the (labial) direction of the x-ray tube [1, 18, 19].

In the case reported in this article, MTA was chosen as the retro-filling material because it is able to provide excellent sealing. According to Koh et al, the capability of MTA to induce cell response is due to the calcium phosphate phase, which causes a change in cell behavior, stimulating the adherence of osteoblasts to MTA.

Conclusion

Early detection is essential for successful management of ECR. Patients with an ECR lesion with no apparent identifiable etiologic factor should have their entire dentition assessed to ensure that no other teeth are affected by ECR. Patients with a history of 1 or more predisposing factors should be monitored closely for initial signs of ECR. The very low risk of developing ECR does not justify taking additional radiographs. However, every radiographic investigation carried out for general examination or diagnostic purposes should be routinely checked for ECR lesions if the teeth in question have been exposed to 1 or more of the predisposing factors.

References

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