

Management of invasive cervical resorption by surgical approach – A case report

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Abstract

External cervical resorption is a type of root resorption that starts in the cervical area of the tooth and spreads out in an uneven pattern throughout the dentin thickness. This resorptive process can expand throughout the dentin, with or without pulp involvement resulting in severe tooth structural loss. Because the pericanalar resorption-resistant sheet surrounds the root canal and acts as a protective layer against resorption, ECR is frequently asymptomatic. It is frequently observed during routine radiological examination. To avoid irreparable tooth damage, prompt diagnosis and treatment are required. This paper presents a case of external cervical resorption and illustrates the effects of surgical approach in the amelioration of this condition.

Keywords: External cervical resorption, invasive cervical resorption, surgical repair, early diagnosis, Heithersay class III

Introduction

Root resorption is characterised by the progressive breakdown of mineralized dental tissue as a result of excessive clastic activity [1]. Based on its location, root resorption can be classified as internal when it begins within the pulp, or external when it begins on the periodontium. External resorption could be further categorized as inflammatory, replacement, and surface resorption [2].

External cervical resorption (ECR) is a localized inflammatory resorption that begins at the cervical aspect of the tooth beneath the epithelial attachment [3& 4]. It is regarded to be a rare disease because of the limited case reports in the literature with the prevalence ranging from 0.02% to 0.08% [5&6]. Although the cause of ECR is unknown, various factors have been postulated as predisposing factors, including orthodontic treatment, oral trauma, dentoalveolar surgery, internal bleaching, restorative treatment, viral illness, and periodontal therapy [7].

Diagnosis of ECR remains a challenge, as in most cases, symptoms do not appear until the resorption has progressed to the advanced stage. As a result, when ECR was diagnosed, it may have caused real damage to the tooth structure. The pathognomonic radiographic feature includes ill-defined cloudy radiolucencies in the cervical region which run vertically through the root canal walls, differentiating it from the internal resorption [8]. This article describes a rare case of external cervical resorption which was treated by surgical approach.

Case Report

A 32-year-old male reported to the outpatient department with the chief complaint of pain in the upper front teeth region. The medical history was non-contributory. The patient presented a history of trauma before 4 years back. On clinical examination, there was a pinkish coloured band at the cervical region of the tooth #21 (Fig.1A). There were no signs of a sinus tract or swelling in the region. Pulp sensitivity tests including cold and electrical stimulus revealed a positive response. There was no tenderness to palpation, biting, or percussion. No mobility was found.

Intraoral periapical radiography revealed a poorly defined radiolucent lesion in the cervical area of the maxillary left central incisor (Fig.1B). An explorer probe was inserted into the cavity to look for any hardened and roughened surfaces to rule out the occurrence of root caries. The resorptive defect was classified as Heithersay class III defect.

The patient was informed about all treatment choices, including extraction and internal repair with root canal treatment and external repair. Surgical repair with root canal therapy was planned after discussing with the patient. A written consent was obtained.

Surgical Procedure

After obtaining effective anaesthesia with the administration of local anaesthesia (lidocaine 2% HCl injection), The root canal treatment was carried out with the use of a rubber dam. The access cavity was extended to include the defect. Hand instruments were used to clean and shape the canal, which was subsequently irrigated with 5.25% NaOCl and dried with paper points. The mucoperiosteal flap was reflected until the defect was accessed both buccally and palatally. Using a dental operating microscope, the resorptive defect was cleaned using surgical curettes by careful application of 90% aqueous trichloro acetic acid. Care was taken not to accidentally touch the adjacent soft tissues by protecting them with the petroleum jelly. Sectional obturation was performed. To reinforce the fracture resistance of the tooth, fibre post (Reforpost, Angelus, Brazil) was luted with the resin cement. The defect area in the subgingival region was restored with biodentine (Septodont, Lancaster, PA, USA). The composite restoration was used to restore the remaining tooth structure (Fig.1C&D). After polishing the restoration, the flap was repositioned and sutured. The patient was prescribed chlorhexidine mouthwash and was instructed to maintain good oral hygiene and annual follow-up visits.

The patient was recalled after five days for suture removal. At the subsequent follow-up visit 6 and 12 months, the tooth was asymptomatic, with no evidence of lesion progression (Fig.1E&F). There were no changes in mobility or pain in response to palpation, biting, or percussion.

Discussion

External cervical resorption (ECR) is described as inflammatory clastic cell (osteoclast) resorption of dental hard tissues (dentin and cementum) [1]. As previously mentioned, various predisposing variables could be linked

to the aetiology of ECR. In this case, the patient had a history of previous trauma to the tooth, which could have predisposed him to ECR. Although the aetiology is multifactorial, orthodontic treatment and trauma were the two most often identified local predisposing variables to ECR, according to Heithersay [5] and Mavridou et al [7]. Trauma was shown to be the most common risk factor in 25.7 and 28.5 percent of ECR patients, respectively [5&7]. Damage to the precementum and predentin acts as a prerequisite for the initiation of ECR. Several factors have been proposed as potential catalysts for ECR progression. Bacterial infection, continuous and discontinuous mechanical stress during orthodontic treatment, chewing, parafunction, or a combination of these factors could cause PDL damage favouring ECR [8].

ECR lesions can be difficult to diagnose. The location and extension of ECR defects determine how they manifest clinically. Early defects or those located in the interproximal portions of teeth may be difficult to identify on clinical examination, while severely cavitated defects in the labial or lingual areas can be diagnosed by direct vision or detected by probing with periodontal probes which bleed profusely due to the presence of inflammatory granulation tissues [9].

The paralleling angle radiographic technique could be useful in detecting and locating external cervical root resorption lesions. However, because the three-dimensional anatomical area being radiographed is compressed into a 2D space, the quantity of information received through digital periapical radiographs is limited [10]. Cone beam computed tomography (CBCT), on the other hand, was developed primarily to assess the true nature and severity of resorption lesions with greater precision [11]. In this case report, as the patient did not consent for CBCT scanning, diagnosis and treatment

planning was performed with clinical and radiographic information.

The major purpose of treating this resorptive defect is to remove the resorptive tissue and reduce the blood supply to the existing odontoclasts. To prevent reactivation of further clastic action, the defect must be fully debrided and sealed. The optimum treatment choice for ECR is mostly determined on the extent of the problem. In this case, the root resorption was extensive on the mesiopalatal aspect of the tooth with pulp involvement, thus the chosen therapy was external repair of the defect with endodontic root canal treatment and reinforcement with fiberpost.

Bioactive restorative materials, such as Biodentine (Septodont, Lancaster, PA, USA), can be utilised to restore subgingival ECR cavities which establish communication with the oral cavity. These bioactive materials results in favourable periodontal attachment and reasonable cosmetic appearance. Moreover, it has a faster setting time (approximately 12 min), which overcomes the long setting time of MTA [12].

Conclusion

The exact nature of the lesion must be accurately assessed in order to manage ECR effectively and predictably. If recognised and treated as soon as possible, the prognosis appears to be favourable. Furthermore, despite the favourable outcome in this case report, more long-term studies with longer follow-up periods are needed to assess and evaluate the impact of ECR classification and repair material choice on treatment outcome.

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Legend Figure



Fig. A: preoperative photograph with pinkish discoloration on cervical aspect.

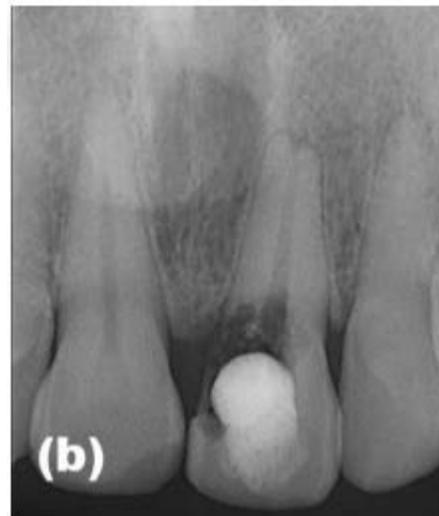


Fig. B: intraoral periapical radiography revealed a poorly defined radiolucent lesion



Fig. C: immediate post operative radiograph

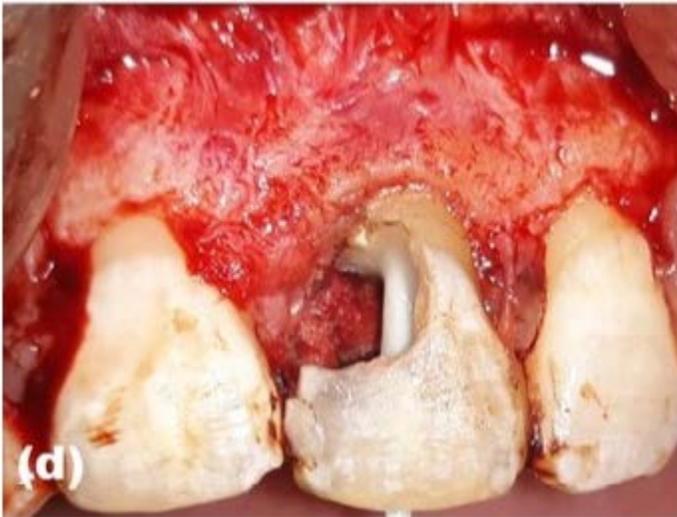


Fig. D: surgical exploration of resorptive defect



Fig. E: restoration of the tooth structure with composite



Fig. F: 12 month followup