



Management of Pink Spot due to Class IV Invasive Cervical Root Resorption using Vital Pulp Therapy: A Case Report

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A 30-year-old male patient with the chief complaint of pink spot discoloration of the tooth crown in his upper left central incisor was referred for endodontic and esthetic management. After thorough clinical and radiographic examinations, the final diagnosis was class IV invasive cervical resorption (ICR) which was conservatively treated with an orthograde approach; *i.e.* vital pulp therapy with calcium-enriched mixture cement (VPT/CEM). The use of VPT/CEM was successful to restore esthetics and stop the ICR; confirmed clinically, radiographically, and tomographically at one-year recall. The above-mentioned minimally invasive approach reported in the current case study may be considered a practical treatment modality for ICR, specifically in anterior teeth.

Keywords: Calcium-enriched mixture cement; CEM cement; Endodontics; Pink spot; Root resorption; Tricalcium-silicate

Introduction

Root resorption is defined as a dynamic process provoking the destruction of different dental tissues; involving periodontal ligaments, dental hard tissues, and even the dental pulp in advanced stages [1]. In addition, pink spots in teeth have been addressed as a usual consequence of root resorption for years. The progress of root resorption in coronal dentin and enamel can produce an observable pinkish color in tooth crown; as the highly vascular tissue becomes noticeable through the thin remaining enamel.

Invasive cervical resorption (ICR) is a diagnostic term used to define a rare clinical condition with a prevalence range of up to 2.3% [2]; ICR is a relatively unusual form of silent but aggressive external root resorption that may happen and create pink spots detectable in any human permanent or primary teeth. Moreover, ICR is categorized into four classes; with class IV characterized by the extensive invasion of the resorbing tissue, involving the coronal dentin, and extending beyond the coronal third of root dentin. Advanced resorption pattern (*i.e.* class IV) is challenging, and the involved teeth have shown poor prognoses [3].

Recently, vital pulp therapy (VPT) using calcium silicate-

based endodontic biomaterials has been introduced to manage and treat the advanced cases of ICR [4, 5]; consequently, the current report investigates the successful use of a VPT modality, *i.e.* coronal pulpotomy, to conservatively manage a class IV case of ICR.

Case Report

A 30-year-old male patient was referred to our clinic due to the detection of a reddish crown discoloration in his upper left central incisor which had lasted for three months (Figure 1A). Clinical examination revealed no other signs and symptoms; the adjacent teeth were vital and identically sensitive to pulp testing. Diagnostic periapical radiography demonstrated a large resorption defect in the tooth crown (Figure 1B), and cone-beam computed tomography (CBCT) with a higher diagnostic accuracy [6, 7] reconfirmed a large resorptive lesion in the tooth crown extending into the mid-root with probable pulpal involvement (Figure 1C-1G). The patient had a good level of general health, and his medical history was noncontributory. In addition, he did not report any history of dental trauma, orthodontic treatment, periodontal therapy or other relevant dental problems. The concluding diagnosis was





Figure 1. (A) A clearly visible pink spot in the crown of tooth 21. (B) Preoperative periapical radiograph; showing a resorptive defect which extended into root dentin. (C) Preoperative cone-beam computed tomography; showing the resorptive defect in the tooth crown. (D) The sagittal view of tooth 21; demonstrating a large resorptive defect that extended into the mid-root. (E-G) Coronal view as well as axial views of tooth 21; showing advanced ICR. (H) Immediate post-treatment periapical radiograph; showing the filled coronal cavity using calcium-enriched mixture cement. (I) Immediate post-treatment clinical photograph; demonstrating a favorable esthetic outcome. (J-K) cone-beam computed tomography at one-year recall; showing an arrested resorptive process and normal periapical area of tooth 21.

asymptomatic pulpitis associated with class IV-ICR. Amongst the suggested treatment options, the patient chose VPT; the informed consent was subsequently obtained.

After local anesthesia and proper isolation, to treat the involved tooth with VPT, an access cavity was prepared. Accessible inflamed tissue, including the dental pulp, was completely removed from the crown using a long-shank round bur. Following the application of 5.25% NaOCl for 1 minute, achieving hemostasis and a clot-free pulpal wound, calcium-enriched mixture (CEM) cement (BioniqueDent, Tehran, Iran) was mixed, inserted, filled and sealed the prepared cavity. Finally, the access cavity was restored with a resin-based dental composite restorative material.

The immediate postoperative periapical radiograph showed appropriate pulp capping as well as a suitable coronal restoration (Figure 1H); with the pink color of involved tooth changed to its original color (Figure 1I). In one-year recall period, clinical examination showed a normal and functional tooth without any crown discoloration. Furthermore, CBCT examination revealed an arrested resorptive process and normal PDL (Figure 1J and 1K); indicative of treatment success.

Discussion

There are no clear treatment guidelines with predictable outcomes for treating ICR; as the causative etiological factors are not well known. Dentists and endodontists tend to leave advanced cases untreated until the teeth become non-functional or need to be extracted. Surgical approaches are inevitable in advanced resorptive defects [8, 9]; however, they usually fail to retain the dental structure due to the lack of accessibility to the entire lesion(s).

In the current study, ICR was successfully managed via a simple VPT modality using CEM cement as a suitable endodontic biomaterial for the management of extensive root resorption [10-12]. The most significant treatment outcomes of the reported case were:

- (i) the arrest of resorptive process,
- (ii) the prevention of further resorption, and
- (iii) the improvement of esthetics with acceptable clinical results. Additionally, CEM endodontic biomaterial may successfully manage ICR in permanent teeth [4]; nevertheless, it needs to be confirmed with further clinical trials.

Conclusion

The present clinical report has shown that VPT, *i.e.* full pulpotomy using CEM cement, could be deliberated as a simple and practical treatment modality to save teeth with class IV invasive cervical resorption, and effectively restore esthetics in anterior teeth affected by a pink spot.

Conflict of Interest: 'None declared'.

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