



## Case Report

# Management of invasive external cervical resorption in maxillary anterior teeth: A case report

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Received : 25 March 2022  
Accepted : 04 April 2022  
Published : 24 November 2022

DOI  
[10.25259/JRDE\\_2\\_2022](https://doi.org/10.25259/JRDE_2_2022)

Quick Response Code:



## ABSTRACT

The progressive breakdown of mineralized tooth tissue caused by overactive resorptive cells is known as root resorption. Root resorption can be divided into two types: Normal and pathologic. In most of cases of internal resorption and external inflammatory resorption root canal therapy is indicated. It may or may not be indicated in cases of invasive resorption, and it is not suggested in cases of replacement or pressure resorption (unless unrelated pulpal conditions necessitate endodontic intervention). Early detection and treatment of these defects might be beneficial to the patient and increase the chances of saving the tooth. In this case, report the description of external resorption post-orthodontic treatment has been restored and followed up and has shown a good prognosis.

**Keywords:** External cervical resorption, Biodentine, Odontoclasts, Composite resin

## INTRODUCTION

External cervical resorption (ECR) is a pathological condition wherein resorption penetrates the dentin at the root's cervical aspect. ECR, which is usually latent in its early stages, can cause serious harm to mineralized dental tissue and potentially invade the pulp if not diagnosed and treated promptly. Despite this, the etiology of ECR is still unknown, making early detection even more difficult. ECR has gotten a lot of attention in recent years because of the increased incidence.<sup>[1]</sup> The progressive breakdown happens due to overactive resorptive cells and this process is called root resorption. Root resorption can be categorized into normal and pathologic resorption depending on whether the outcome is desired or not.<sup>[2]</sup> According to various epidemiological researches, the prevalence rate has risen from 0.02% to 0.08%.<sup>[3]</sup> Various treatment modalities have been tried till date which include internal repair, intentional reimplantation, periodic review, and extraction. The present article aims to propose a novel treatment modality for ECR through a surgical approach.

## CASE REPORT

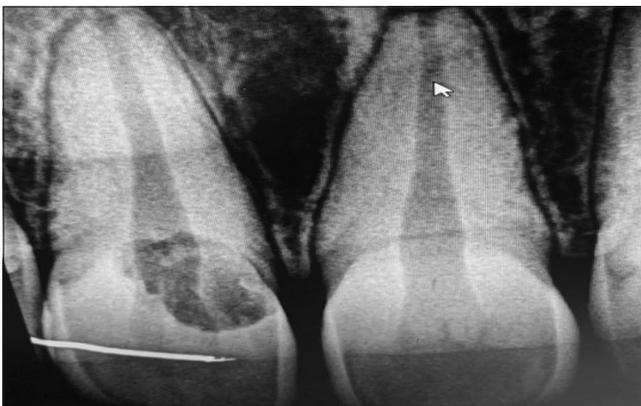
A 24-year-old female patient reported to the department of conservative dentistry with the esthetic concern of gingival overgrowth in the upper anterior region. Dental history of the patient revealed orthodontic treatment one year ago. On clinical examination, it was noted that there was gingival inflammation concerning the right maxillary central incisor 11 and gingival ingrowth was noted [Figure 1]. On radiographic examination, a large ill-defined,

radiolucent defect was noted which was extending up to the coronal 3<sup>rd</sup> of the root indicative of Heithersay Class 3 [Figure 2].<sup>[4]</sup> On probing the gingival sulcus, a defect was noted. No tenderness on percussion was present. The tooth had a lingering response to the vitality test using the cold test.

First, root canal treatment was initiated. Local anesthesia was administered. Access opening and working length determination were done using an apex locator (J Morita Root Zx Mini Apex Locator) in conjunction with the radiographic method. After cleaning and shaping of the canal was completed (biomechanical preparation done up to K file no. 45), calcium hydroxide intracanal medicament was placed for 14 days and obturation was done using lateral compaction technique. A cone-beam computed tomography (CBCT) was taken to confirm the exact location and extent of the defect. The deepest point had a depth of approximately 3.2 mm (buccolingual), mesiodistally, the defect was noted to be 4 mm, and the length of the defect was 4.8 mm [Figure 3].



**Figure 1:** Pre-operative clinical photograph showing gingival overgrowth into the resorptive defect with respect to the right maxillary central incisor (11).



**Figure 2:** Pre-operative intraoral periapical radiograph depicting radiolucency in the cervical region of 11.

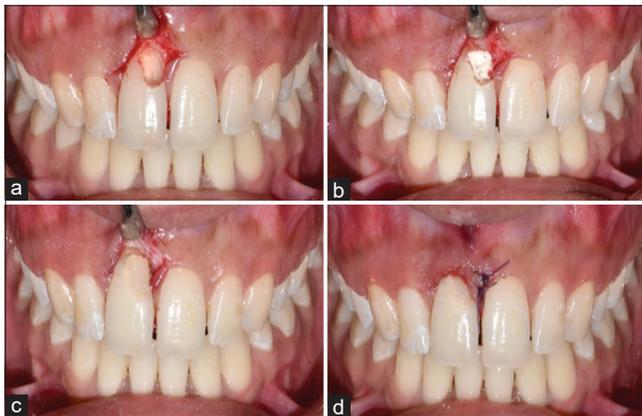
After the root canal treatment was completed, surgical intervention was planned as the resorption area was filled with soft-tissue ingrowth. A simplified papilla preservation flap was considered in this case as the area of interest was in the maxillary anterior region.<sup>[5]</sup> After the full-thickness flap was reflected and hemostasis was achieved, isolation of the field was obtained. A cotton pellet soaked in 5% sodium hypochlorite (prime sodium hypochlorite 5.25%) was applied to the resorptive defect to encourage coagulation necrosis of this tissue as it enters the smaller, more inaccessible areas, and resorptive channels that mechanical instruments alone may not be able to reach and debride, few studies also used 90% aqueous trichloroacetic acid in the defect site when the former was not available.<sup>[4]</sup> Then, a biocompatible material, Biodentine (Biodentine™ Septodont), was placed over the resorptive defect followed by glass ionomer cement (GC Gold Label, Glass Ionomer Restorative Cement) base and composite restoration (Shofu beautiful II) was done. The flap was then repositioned back to its position using vertical mattress sutures with the help of 5-0 Vicryl sutures [Figure 4]. Postoperatively, a nonsteroidal anti-inflammatory drug (etoricoxib 90 mg) was given once daily for 3 days. The patient was also advised to rinse 0.2% chlorhexidine digluconate twice daily for 14 days. The patient was recalled after 7 days for suture removal. The healing of the site was uneventful. The patient was also advised to continue brushing with a soft bristle brush after 1 week for the next 10 days. Follow-up at 6 months revealed healthy interdental papilla and radiographic evaluation with a CBCT revealed no further progression of the resorption [Figures 5 and 6].

## DISCUSSION

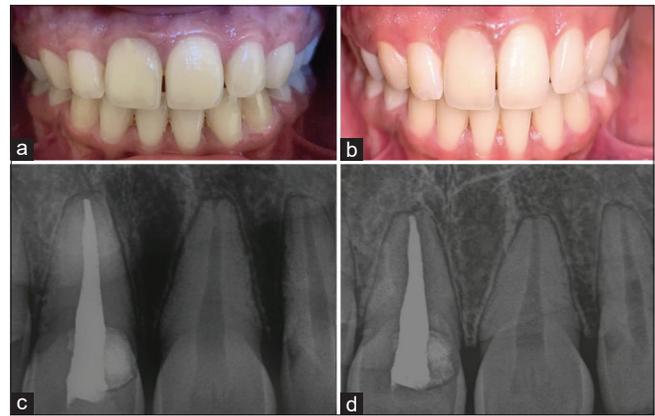
ECR is defined as inflammatory resorption of dental hard tissues (dentin and cementum) by inflammatory clastic cells (odontoclasts).<sup>[3]</sup> Several predisposing variables have been associated with the etiology of ECR, as previously mentioned. In the present case, the patient gave a history of orthodontic treatment, which could be a predisposing factor to ECR.<sup>[4]</sup> Excessive forces applied to the cervical portion of the tooth during orthodontic treatment can cause cemental tears further leading to its necrosis and surrounding areas, exposing the root dentin. As a result, mononuclear precursor cells may be stimulated to differentiate into odontoclasts, resulting in root resorption. The diagnosis of ECR can be challenging, along with the clinical and periapical examinations, a CBCT is a must where the detection of the lesion is unclear, and in some situations, a CBCT also helps in treatment planning. ECR can be observed in several planes without any geometric distortion or superimposition of underlying structures in CBCT. The main purpose of



**Figure 3:** CBCT revealed the exact location and extent of the lesion.



**Figure 4:** Intraoperative pictures (a – defect on reflection of the removal; of tissue in growth), (b and c) defect site filled with Biodentine and composite, and d – flap closure.

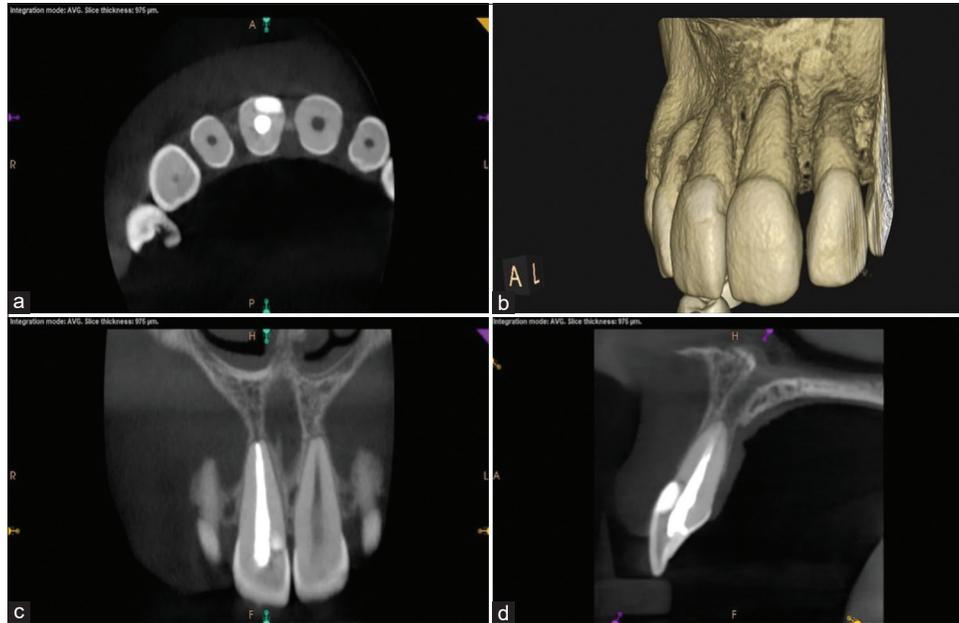


**Figure 5:** (a and b) One month and 6 months clinical picture and (c and d) intraoral periapical radiograph at 1 month and 6 months, respectively.

treating a resorptive defect is to inactivate the resorptive process, remove the resorptive tissue, reduce the blood supply to the existing odontoclasts, and to further prevent revascularization and further clastic action, the defect must be fully debrided and sealed.<sup>[6]</sup> The ideal treatment choice for ECR is mostly determined by the extent of the damage. One study suggests that calcium hydroxide has actions such as arresting inflammatory root resorption and stimulation of healing when used as an intracanal medicament.<sup>[7]</sup> To restore the defect, several bioceramic materials have been considered such as mineral trioxide aggregate MTA and Biodentine. MTA is reported to have a higher rate of reparative dentin production and superior structural integrity.<sup>[8,9]</sup> However,

due to its long setting time, it was not considered for this case. Biodentine has been chosen as the material of choice in this case due to its ability in periodontal ligament PDL attachment and also has an acceptable cosmetic look.<sup>[10]</sup> In cases where the resorption involves the labial aspect of maxillary incisor teeth, 3–4 mm of the superficial Biodentine may be removed at the same session and the remaining cavity replaced with a glass ionomer and/or composite resin restoration to achieve better esthetics.

Although the present case showed a favorable outcome, further long-term studies with longer follow-up periods are required to evaluate the efficacy of Biodentine in ECR cases.



**Figure 6:** six month follow-up CBCT reveals no further progression of the resorption

## CONCLUSION

Early diagnosis and its management can give a successful outcome as shown in this case. However, further long-term studies are required to confirm that Biodentine is the material of choice in ECR.

## Declaration of the patient consent

The authors certify that they have obtained all appropriate patient consent.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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**How to cite this article:** Nireeksha BN, Harsha P, Naik BD, Setty S, Horatti P. Management of invasive external cervical resorption in maxillary anterior teeth: A case report. *J Restor Dent Endod* 2021;1:63-6.