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CASE REPORT

USE OF RECENTLY INTRODUCED BIO-MIMETIC MATERIAL IN THE MANAGEMENT OF CLASS IV INVASIVE CERVICAL ROOT RESORPTION: A CASE REPORT

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Abstract

External cervical root resorption though uncommon, but can lead to extensive mutilation of dental hard tissue which ultimately results in tooth loss. This case report describes the diagnosis and successful treatment of a 22 year old female patient with trauma induced invasive cervical root resorption in #11. The defect was surgically managed using recently introduced highly biocompatible dentine substitute, BIODENTINE. Clinical and radiographic follow up for 12 month revealed arrest of resorption and good healing of the defect with evident bone formation.

INTRODUCTION

Root resorption is a common pathological outcome which in permanent dentition can cause irreversible hard tissue damage and progressively results in tooth loss (1). There are two types of root resorption: internal and external, based on its location in relation to tooth surface.

External resorption is a process that may lead to the loss of cementum, dentin, and bone as a result of odontoclastic action. External root resorption can be further classified into surface resorption, external inflammatory resorption, external replacement resorption, external cervical resorption, and transient apical breakdown (2). External cervical resorption is a distinctive type of external inflammatory root resorption which was termed by Heithersay, as invasive cervical resorption (ICR) because of its cervical location and invasive nature (3, 4). Various etiological factors viz. orthodontic treatment, trauma, intracoronal bleaching, surgery, para-functional habits etc. have been reported in the literature (3, 4, 5).

Early and accurate diagnosis and appropriate management minimises complications. Heithersay recommended the treatment regimen which includes both mechanical and chemical debridement of resorptive lesions, followed by a suitable restoration.

The present case report describes the surgical management of invasive cervical root resorption in maxillary central incisor using Biodentine (Septodont, Saint-Maur-des-Fosses, France), a newly introduced calcium silicate based cement. It has favourable physico-chemical properties which make it clinically easy to handle and compatible with all endodontic procedures (6).

A 22 year old female patient reported to the department of conservative dentistry and endodontics with a chief complaint of pain and recurrent swelling in right upper front tooth since 1 month.

Medical history was non-contributory, but dental history revealed two episodes of trauma to # 11 (FDI classification). First one dates 15-16 years back, for which she had undergone endodontic treatment and complete

obturation with MTA for management of open apex. Second episode of trauma occurred 3 months back. On probing the distal aspect of right maxillary central incisor, a pocket depth of 7mm, fibrous sensation and bleeding from gingival sulcus was noticed (Fig 1a). Probing the defect revealed surrounding dentine to be hard and solid with a sharp scraping sound. A periapical radiograph revealed an irregular radiolucent area in the distal aspect of the right central incisor involving cervical and middle third of the root along with bone destruction (Fig 1b).

On the basis of history, clinical examination and radiographic findings a diagnosis of Class 4 invasive cervical resorption in #11 was made. Informed consent was taken and treatment was directed towards debriding and restoring the defect with a biomimetic material through a surgical approach as tooth was already obturated.

After achieving profound anaesthesia, intrasulcular incision was made on the labial aspect of maxillary right central incisor and full thickness flap extending from the distal aspect of left maxillary central incisor to distal aspect of right maxillary lateral incisor was reflected. Granulomatous tissue was carefully removed and the irregular borders of the defect were smoothed with a bur and the cavity was thoroughly irrigated with sterile saline solution and dried with sterile gauge (Fig 2). Biodentine was mixed according to manufacturer instruction and subsequently sealed into the resorption site (Fig 3). The flap was repositioned without tension and sutured.

1 year follow up revealed good healing of both the soft and hard tissues. The pocket depth had decreased from 7mm to 3mm. No other subjective symptoms were noticed during the follow up period. The progression of the inflammatory external root resorption ceased and the resorptive lacunae were filled with newly formed bone, which was evident radiographically (Fig 4).

Discussion

Heithersay in 1999 (3) classified ICR based on the extent of lesion within the tooth: Class I as small invasive resorptive lesion with shallow penetration into dentine, Class II as well defined invasive resorptive lesion close to the coronal pulp chamber, Class III deeper invasion extending into the coronal third of radicular dentine and Class IV as a large invasive lesion extending beyond the coronal third of the root. As the resorption invades the middle third of the root, this case was classified as class IV.

This type of resorption is usually diagnosed by thorough clinical and radiographic examination. Clinical features differ depending on the stage of lesion. There is progressive loss of cementum, dentine and enamel with replacement by fibro-vascular tissue derived from periodontal ligament. However, some teeth provide no visual signs of cervical invasive resorption and the diagnosis is usually made during routine or radiographic examination (3). Probing is important to differentiate cervical invasive root resorption from subgingival caries. Subgingival caries have a sticky sound on probing; the base of the defect of ICR has a hard, scraping sound. Probing the resorptive defect and associated periodontal pocket can cause abundant bleeding from the underlying highly vascular granulation tissue.

Since the tooth was well obturated with MTA, surgical exposure of the resorptive site was planned to remove the granulation tissue and restoration of defect. Excellent restoration and seal of resorptive cavity are of utmost importance for successful treatment outcomes. As restorative material is placed in contact with the periodontium, therefore, they should be biocompatible and not sensitive to moisture and blood contamination.

MTA has been documented as a successful repair material in cases of invasive cervical resorption (7). Recently, various calcium silicate based materials have been introduced to overcome the drawbacks of MTA such as its difficult handling property and long setting time (8).

Among these materials, Biodentine has been proposed as a favourable repair material due to its bioactivity and biocompatibility (6, 9). Biodentine has setting time of less than 12 minutes, high mechanical strength and also excellent sealing ability. Ability to release calcium ion and extending the alkaline environment makes biodentine more conducive for osteoblastic activity. Calcium and hydroxide ions stimulates the release of pyrophosphatase, alkaline phosphatase and BMP-2, which enhances the mineralsation process (10).

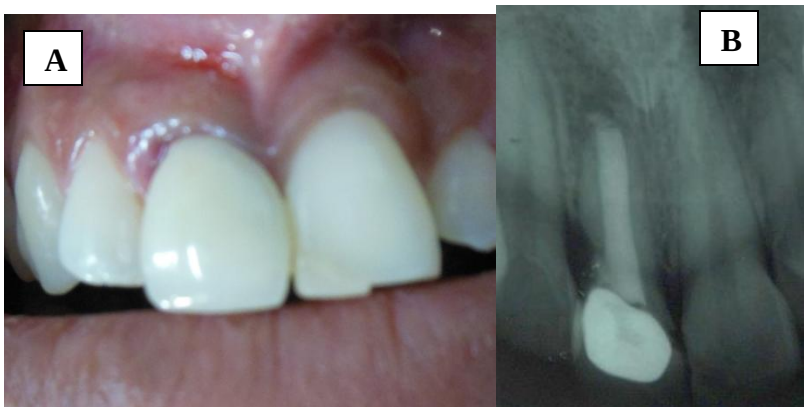

Figure 1. Pre-operative (A) clinical view; (B) radiographic view showing resorptive defect

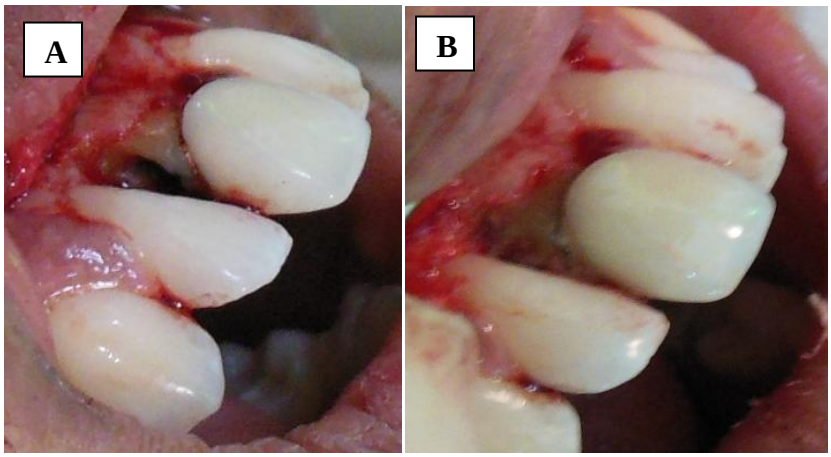

Figure 2. (A) Surgical view showing defect; (B) Defect repaired with Biodentine

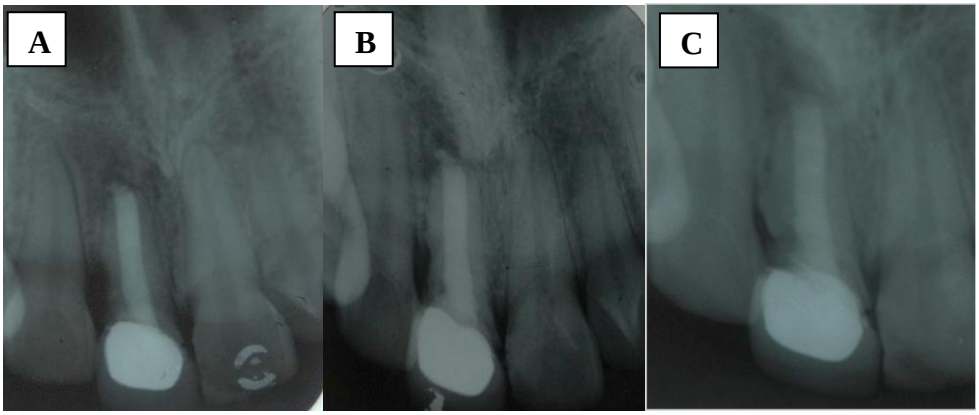

Figure 3. (A) Post –operative Radiograph.
Follow-up Radiographs (B) 6 months; (C) 1 year showing evident bone formation.

CONCLUSION

This case report demonstrated the successful clinical application of biodentine in management of ICR. Biodentine not only halted the lesion progression but also induced osteoblast proliferation and bone regeneration.

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