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Case Report

Rehabilitation of Invasive Cervical Resorption Using Biodentine – A Case Report

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Abstract

Aim and Background: Invasive cervical resorption of the tooth is relatively uncommon with unknown etiology. It is initiated on the external aspect of the root, apical to the apical attachment. It is often aggressive, resulting in significant loss of tooth structure.

Case Description: A female patient clinically presented with cervical cavitation with pinkish discoloration of tooth which was detected by incidental radiograph. This is usually misdiagnosed as root caries, cervical burnout, or internal resorption. The use of cone beam computed tomography (CBCT) gives a three-dimensional insight into lesions and the ability to determine the most suitable treatment plan. This case report highlights the use of CBCT for confirmation of lesion on 11 and 21, and subsequent surgical management with Biodentine to replace the lost cementum.

Conclusion: Correct diagnosis and proper management can result in a successful outcome.

Key words: Biodentine, Cone beam computed tomography, Invasive cervical resorption

INTRODUCTION

Invasive cervical resorption (ICR) is an external inflammatory root resorption that occurs after injuries or irritation of the periodontal ligament or pulp. It is often misdiagnosed as internal resorption because of its similarity to clinical presentation as a pink spot. It is usually asymptomatic with unknown etiology and occurs on maxillary anterior teeth. Most commonly seen with patients undergoing orthodontic and periodontal therapy, intracoronal bleaching, and traumatic prone tooth.[1] Other predisposing factors are bruxism, intracoronal restoration, developmental defects, and systemic diseases. This form of external resorption has been described at length by Heithersay who preferred the term ICR which describes its invasive and aggressive nature. This usually occurs immediately below the epithelial attachment of the tooth at the cervical region which is difficult to diagnose and manage.[2]

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CASE DESCRIPTION

A 20-year-old female patient presented to the Department of Conservative Dentistry and Endodontics with bleeding gums and a pinkish appearance of maxillary right and left central incisors. The patient noticed the color change over a period of 2–3 years and felt that the lesion had increased in size over the year [Figure 1]. There was no history of trauma, orthodontic treatment, or bleaching. There was no relevant medical history. The marginal gingival of the right and left central incisors was erythematous. The crown of 11 showed pink discoloration in the cervical third of the labial surface that appeared to originate subgingivally. On probing the soft tissue, a fibrous sensation was felt and bleeding was observed. Periodontal probing revealed

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pocket depths of 5 mm and 7 mm at the buccal gingival sulcus with 11 and 21, respectively.

The teeth gave a delayed response to thermal and electric pulp tests and were not tender to percussion. A periapical radiograph of 11 revealed an irregular but well-demarcated area of radiolucency at the cementoenamel junction and on 21 extended up to the midroot. The resorptive radiolucency was superimposed but did not appear to alter the pulpal outline. There was no interdental bone loss, lamina dura was intact, and periodontal ligament space was slightly increased at the apical area [Figure 2].

To rule out internal resorption, a radiograph was taken with mesial and distal angulation shift and radiolucency was shifted which confirmed that it was an external resorption.

A cone-beam computed tomography (CBCT) image was taken to know the extent of true size location, circumferential spread, and proximity of the lesion to the root canal [Figures 3 and 4]. This 3D CBCT confirmed that the lesion was ICR on 11 and 21 which involved the root canal.

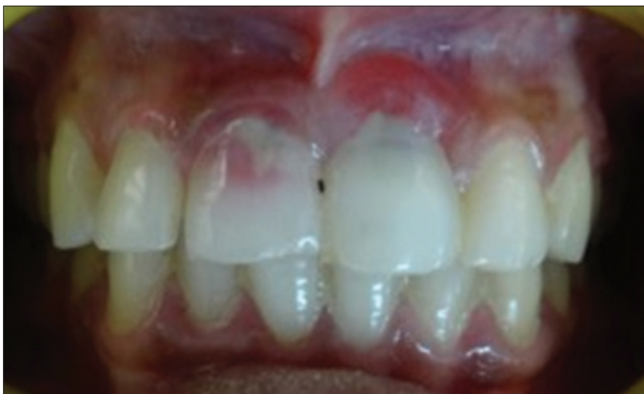

Figure 1: Pre-operative labial view showing pink tooth with 11 and abscess in relation to 21

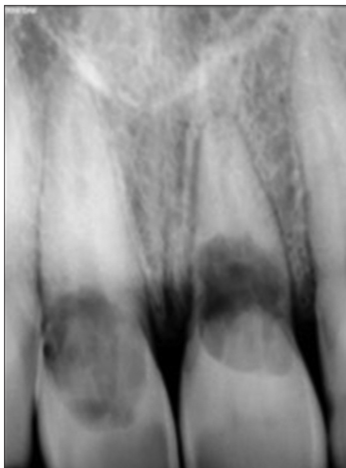

Figure 2: IOPA with 11 and 21

It was decided to perform root canal therapy followed by surgical management of the lesion. The treatment plan was explained to the patient and consent was obtained.

Local anesthesia was performed for the maxillary central incisor, rubber dam isolation was done, and access opening was performed on 11 and 21. The working length was determined using the apex locator. The root canals were prepared with a Protaper rotary file till F3 and 17% ethylenediaminetetraacetic acid (EDTA) was used as a lubricant (Prime Dent Product Limited, India). The canals were irrigated with a 3% sodium hypochlorite solution. The calcium hydroxide paste was applied as an inter-appointment medicament.

On the next visit, the root canal dressing was removed and a surgical procedure was performed under local anesthesia by elevating the mucoperiosteal flap [Figure 5].

The fibrous tissue was curettage from the resorptive area and the resorptive cavity was thoroughly debrided and

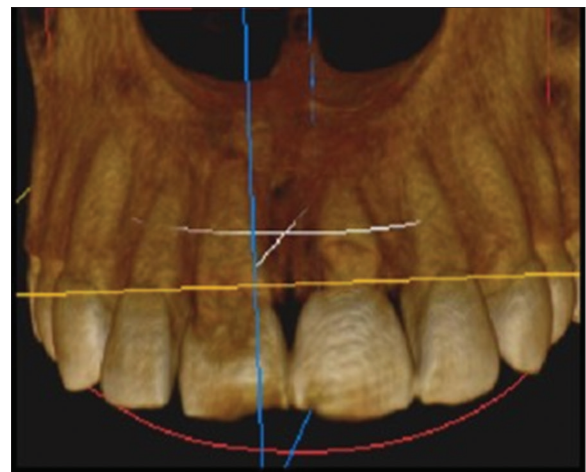

Figure 3: 3D cone beam computed tomography model showing the destruction of tooth surface

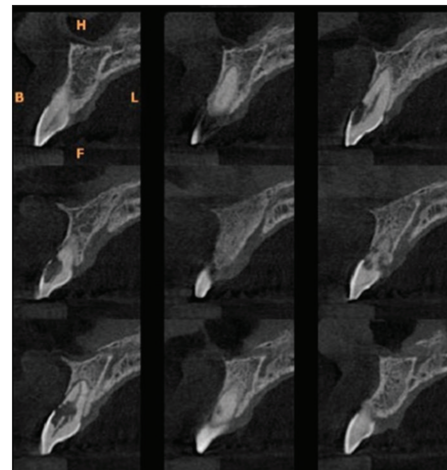

Figure 4: Axial slicing of 11 and 21 showing the resorption is external invading into root canal

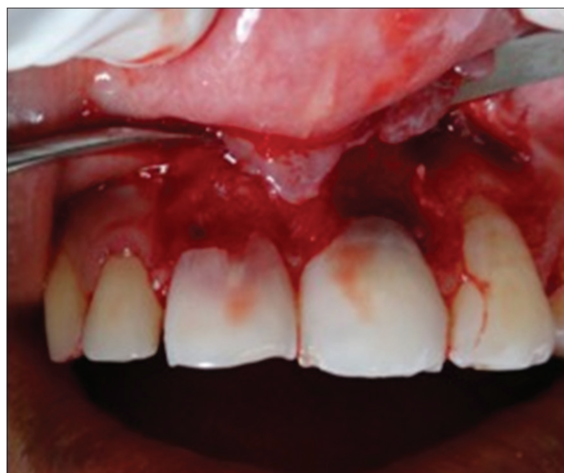

Figure 5: Full-thickness mucoperiosteal flap reflected

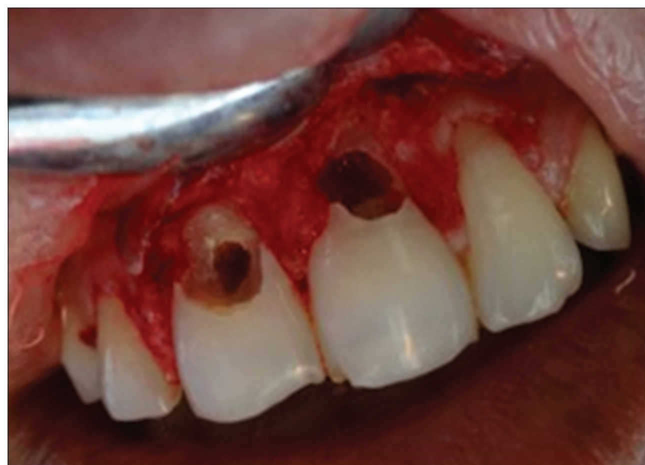

Figure 6: After complete removal of the granulation tissue

thin, fragile enamel bordering the defect was removed. Perforation to the pulp canal was found. The root canal with the resorptive defect was thoroughly cleaned by rinsing with an alternating solution of 3% NAOCL and 17% EDTA (Prime Dental Product Limited, India). After drying the site, the root canal of 11 and 21 was obturated with gutta-percha with sealer and sealed below the resorptive defect [Figures 6 and 7].

Then the resorptive area was filled with Biodentine (Biodentin™ Septodont). It was manipulated according to the manufacturer's instructions and contoured as per the external root anatomy of the tooth [Figure 8].

The material was left for 15 min to achieve the initial setting and hardness. After the setting of Biodentine was confirmed, the flap was positioned in place and sutured with 3–0 black silk suture material. The patient was instructed to report after a week for suture removal. A post-operative intra-oral periapical radiograph was taken. After suture removal, the Biodentine which was extended onto the crown was reduced and restored with composite [Figures 9 and 10].

The patient was subsequently advised for regular follow-up. One-year follow-up radiograph was taken [Figure 11].

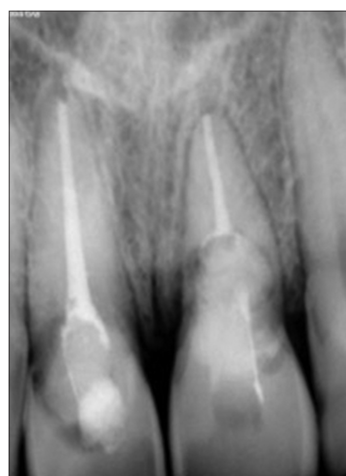

Figure 7: Gutta-percha condensed below the lesion and lesion filled with Biodentine

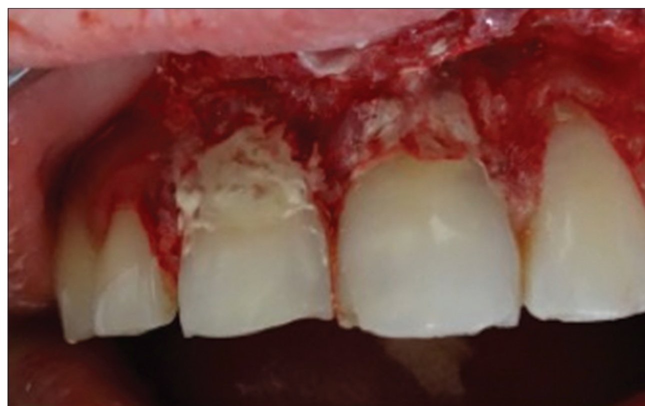

Figure 8: Placement of Biodentine

DISCUSSION

Treatment regimens for the resorption are different so accurate diagnosis plays an important role. It is important that most invasive cervical resorptive lesions not be treated as endodontic problems. Hence, early diagnosis with advanced imaging techniques with CBCT helps to deal with the situation.[3] CBCT is a reliable diagnostic tool to identify the size, location, circumferential spread of the lesion, and its extension into the root canal. However, the radiograph often does not reflect the true nature of the lesion.[4] ICR is commonly found in the cervical region of the tooth. A pink spot on the tooth is a clinical sign noticed by the patient/dentist that brings the problem to light. This discoloration is a result of highly vascular granulation tissue within the tooth becoming visible through the thinned-out dentin and translucent overlying enamel, if there is no pink

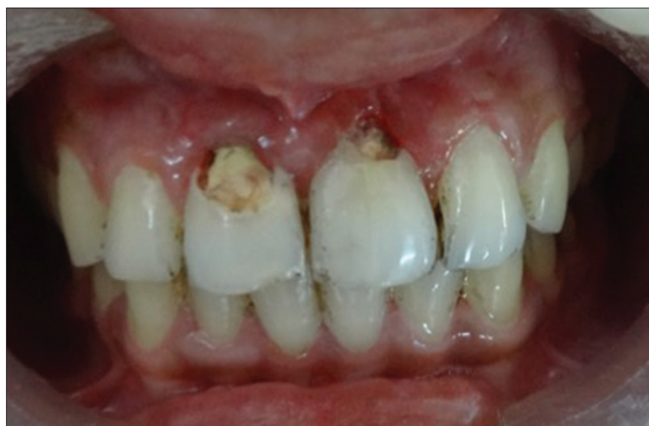

Figure 9: Sutures removal and superficial layer of Biodentine removed

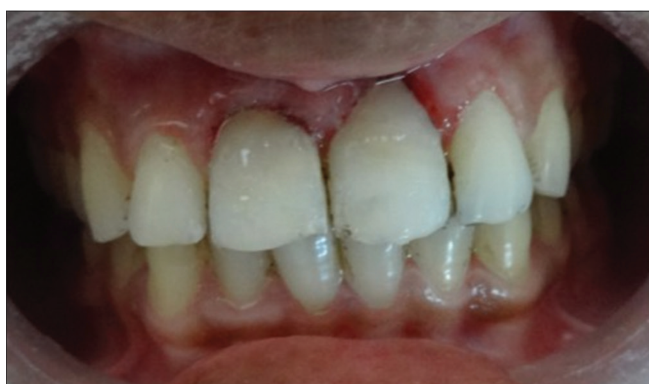

Figure 10: Final composite restoration

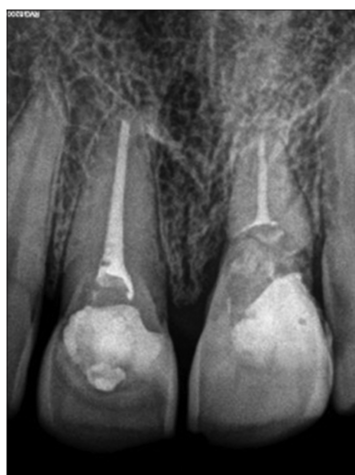

Figure 11: 1-year follow-up radiograph

spot is seen, the condition might go unnoticed until there is pulpal or periodontal involvement, because these lesions are usually painless.

It is important to differentiate ICR from subgingival caries which will feel sticky on probing and does not present with pink spots. The base of the ICR defect will feel hard and also result in a scraping sound when probed.[5]

Probing of ICR defect is associated with periodontal pocket and presents with bleeding of the underlying highly vascular resorptive tissue.

This lesion is detected with a routine radiograph. The severity of ICR determines its radiographic appearance. Early lesions might be radiolucent and more advanced lesions had mottled appearance. The outline of the root canal is visible and intact, indicating that the lesion lies on the outer surface of the root.

The parallax technique is useful to follow the continuity of the pulp canal and to distinguish between internal and external resorption. In the case of internal resorption, the defect remains centered on the root canal system regardless of the angle of the radiograph exposure, whereas with ICR the defect will either move in the same or the opposite direction of the X-ray tube.[6]

Cervical burnout appears as a radiolucent band across the entire neck of the tooth.

Several treatment regimens have been suggested in the literature depending on the nature of the lesion. These include intentional replantation, guided tissue regeneration, treating the ICR lesion by an internal approach, and forced orthodontic extrusion.[7]

Treatment objectives involve complete removal of the resorptive tissue and restoration of the resulting defect with a plastic tooth-colored restoration. Endodontic treatment may be considered if the lesion has perforated the root canal.

In this case, a full-thickness periosteal flap was reflected to perform complete curettage of granulomatous tissue, and topical application of trichloroacetic acid was applied which resulted in coagulative necrosis of the resorptive tissue. Since the lesion perforated into the root canal. RCT was completed and the resorptive area was filled with Biodentine which is dentin replacement and enhances the regeneration of periodontal tissue.[8] Hence it is considered as material of choice. Later on, the esthetic area was restored with a composite restoration.

CONCLUSION

Early detection is essential for successful management and outcome of ICR. CBCT appears to be a promising diagnostic tool for confirming the presence, appreciating the true nature, and managing ICR. Biodentine is one of the calcium silicate-based materials claimed to have better sealing properties than other bio-active materials.

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