

MANAGEMENT OF INVASIVE CERVICAL RESORPTION WITH BIODENTINE: A CASE REPORT

ABSTRACT

Invasive cervical resorption is entirely an uncommon entity in dental community that is not well understood. Accurate diagnosis of the situation and immediate treatment execution are prerequisites for long term retention of the tooth. Treatment procedure includes elimination of the resorptive tissue followed by restoring the defect with a suitable biocompatible material. The necessity of endodontic treatment depends on whether the defect had invaded the root canal or not. This case report elaborates the surgical management of a class IV invasive cervical resorption in the central incisor followed by restoration of the defect with biodentine.

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KEYWORDS

Invasive cervical resorption. Biodentine.

INTRODUCTION

Root resorption refers to the process of the destruction of cementum and/or dentine through physiological or pathological activity of dentoclasts.¹ Even though physiologic root resorption is inevitable, the pathological resorption may lead to tooth loss. Depending on the location of resorption, root resorption can be classified into two types: internal and external resorption. The term Invasive cervical resorption denotes an aggressive form of external tooth resorption and can be defined as a localized resorption that initiates at the zone of connective tissue attachment on the root surface.²⁻⁵

Orthodontic treatment, trauma, surgical and periodontal procedures, internal bleaching etc. include predisposing factors for invasive cervical resorption.⁶⁻⁹ Successful outcome depends on early diagnosis, limiting and restoring the resorptive lesion. Various materials can be used for restoring the resorptive defects. Biodentine is a novel bioactive and biocompatible material that has great improvement compared to the other calcium silicate dental materials. The compressive strength, elasticity modulus and micro hardness are comparable with that of natural dentine. The material is stable, less soluble, non-resorbable and easy to prepare and place, needs much less time for setting. Due to its improved material properties, Biodentine has a distinct advantage over its

closest alternatives in treatment of teeth with resorptive defects.¹⁰ This case report describes the surgical management of a class 4 invasive cervical resorptive defect with biodentine.

CASE REPORT

A 30-year-old female patient reported to the Department of Conservative Dentistry and Endodontics with pain, mild discoloration and bleeding from her right upper front tooth. She had noticed mild discoloration of 11, bleeding and a swelling in the palatal aspect of 11 and 21 for the past few months.

Review of the dental history revealed a cleft lip repair 9 years back and repeated orthodontic treatment. During the clinical examination, mild discoloration of 11 can be noticed at cervical region. A swelling of 1cm diameter had also been noticed on the palatal aspect of 11 with inflamed gingiva and profuse bleeding. Probing on the cervical area of 11 revealed a sharp subgingival defect on the palatal aspect.

Both 11 and 21 responded positive to percussion test and negative to thermal and electric pulp tests. Radiographic examination revealed 11 with an asymmetric irregular radiolucent area extending from the cervical third to middle third of the root which is in continuous with pulp space. Vertical bone loss can be located on the mesial and distal aspect of 11. Periapical aspect of 21 shows irregular

radiolucency with destruction of lamina dura (Figure 1). Considering both radiographic and clinical findings, the diagnosis was class IV invasive cervical resorption on 11.



Figure 1. Resorptive defect.

With the patient's consent, conventional root canal treatment up to cleaning and shaping followed by surgical repair of resorbed root and obturation was planned. Both 11 and 21 endodontically accessed under local anaesthesia and working length determined using electronic apex locator which was confirmed by radiographic method (Figure 2). After working length determination, root canal cleaning and shaping of both 11 and 21 had done. Cleaning and shaping had done up to ISO K file size 70 and MAF was 50 for both 11 and

21. The root canals were irrigated with 2.5% NaOCl during cleaning and shaping. Calcium hydroxide dressing had given and access cavity was temporarily sealed. Patient recalled for the surgical repair on the next week.



Figure 2. WL determination.

Under local anaesthesia, a full-thickness palatal flap extending from distal aspect of 14 to distal aspect of 23 was raised after giving sulcular incision. Perforating defect on 11 was visualized. To visualize the complete extensions of the defect on the apical region, bone removed from the apical aspect of defect using high speed high torque hand piece with 7/8 round bur. Then lesion was treated with a 90% TCA after protective application of

glycerol to adjacent soft tissues before the curettage of the lesion.

Granulomatous tissue was removed from the resorptive site efficiently using curette (Figure 3). After the chemo mechanical debridement, repair of the defect was done with biodentine (Figure 4). Flap was replaced and sutured. Tooth was obturated with gutta percha using cold lateral condensation technique. Patient was recalled and reviewed at 1st, 2nd and 6th month and 1st year (Figure 5). Radiographic review had done after 6th month and 1st year (Figure 6). Now patient is asymptomatic.



Figure 3. Perforating defect after flap reflection and curettage.

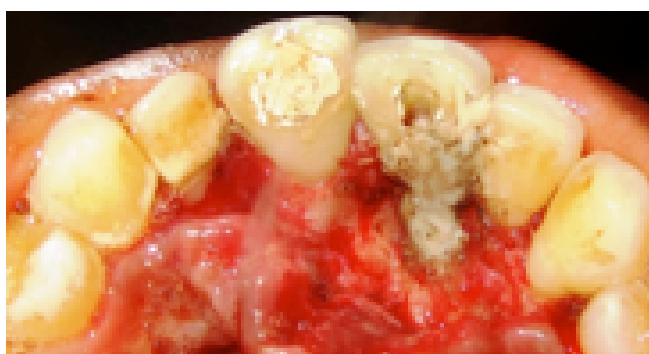


Figure 4. Repairing defect with biodentine during procedure.



Figure 5. 1st year clinical review.



Figure 6. Review after one year.

DISCUSSION

An Invasive Cervical Resorption is an aggressive pathological lesion characterized by its cervical location. Though exact etiology is unknown, orthodontic treatment, trauma, surgical and periodontal procedures, internal bleaching etc. can be the predisposing

factors⁶⁻⁹. In the case presented incomplete orthodontic treatment that patient had undergone may be the etiological factor.

Earlier the diagnosis, more predictable will be the treatment outcome. Because of the nature of the lesion, it can be misdiagnosed and incorrectly treated. Heithersay had developed a clinical classification as a guideline for diagnosing and treating the cases of invasive cervical resorption.⁹

In the case presented, differential diagnoses included internal resorption and sub gingival caries. Internal resorption was excluded by the non-centric nature of the defect in the root canal as the angle of exposure changed and sub gingival caries was excluded by the hard base of the defect.¹¹ The severity of external resorption was determined by its radiographic appearance. As lesion was an asymmetrical radiolucency invading pulp space with irregular margins extending from the cervical region to middle third of the root of 11 (fig. 1) it can be grouped under Heithersay's class 4 lesions. The entire elimination of the resorptive tissue and restoration of the defect were the aims of treatment. Treatment plan usually depend on the severity and location of the defect, whether it had perforated the root canal and the restorability of the tooth.¹²

Since the resorptive defect includes the root canal in class 3 class 4 lesions, endodontic treatment must be considered.^{5, 13} For

both Class 3 and Class 4 cases, both the non-surgical and surgical approaches will be necessary. Reflecting a full-thickness periosteal flap or orthodontical extrusion of the tooth allows complete access into the lesion.¹¹ The treatment protocol also included topical application of a 90% aqueous solution of trichloroacetic acid for coagulation necrosis of the resorptive tissue before curetting it.¹²

Alternate treatment options for class 4 cervical resorption included extraction of the tooth followed by an implant placement or intentional replantation.

Glass ionomer, light-cured resin composite, amalgam and mineral trioxide aggregate (MTA) can be used to restore the resorption.^{8, 14} Periodontal reattachment cannot be expected with composite resin or with glass ionomer cement but may occur with MTA.¹⁵ Novel calcium silicate-based materials have been developed to improve some drawbacks of MTA such as its difficult handling property and long setting time.¹⁰ Biodentine is one such material claimed to be used as a dentine restorative material in addition to endodontic indications similar to those of MTA which include perforation repair and repair of the resorptive defects.¹⁰ This novel calcium silicate material developed to overcome the demerits of MTA like difficulty in handling the material and long setting time.¹⁰

In the case presented, the defect was located on the palatal aspect on probing. Since

the diagnosis was Heithersay's class 4 lesion, we planned for a combination of surgical approach and endodontic treatment and as the defect was on the palatal aspect we opted for a full thickness palatal periosteal flap.

Advantages for considering such a flap design include better access into the lesion, esthetics, and less resorption. Disadvantages include difficulty in reflecting the flap and delayed healing. My selection was Biodentine because it has a better consistency after mixing and faster setting when compared to MTA which allows easier placement in areas of defect. It is bioactive, biocompatible, and non resorbable and having sufficient amount of push out bond strength with dentinal walls which makes it an excellent material for perforation repair. Also it produces tighter seal in the area of the defect and prevents microleakage.¹⁰

CONCLUSION

Invasive cervical resorption is usually not well known in dentistry. So this can be easily misdiagnosed by the professionals and may be the reason behind incorrect treatment. Late diagnosis is the major barrier for good prognosis and for advanced cases prognosis is doubtful. Prognosis depends on the size and class of the lesion and also on the structural integrity of tooth after the treatment completed. Proper case selection, early diagnosis and proper execution of treatment

protocol can lead to successful outcome and long term retention of tooth. Biodentine cement as a sealing material is a new approach for treating the external cervical resorption. Even though this case report denotes a successful outcome, further studies have to be conducted and evaluated to prove efficiency of the biodentine as sealing material in treating the external cervical resorption, before drawing any conclusion.

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