Invasive Cervical Resorption: A Case Report and Review of Literature

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Abstract:
Invasive Cervical resorption is a form of external root resorption that begins from the cervical region of the tooth. The primary difficulty in treating this entity resides in the fact that it is not only difficult to diagnose, but is a challenge to treat as well. This case report involves the successful treatment in an 80 year old low risk female patient with a complicated medical history of the above described lesion on a tooth with the implementation of a flap surgery in conjunction with the placement of a resin modified glass ionomer cement in order to correct the defect. This paper also describes in brief the etiology and treatment to be carried out in such cases.

Key words: Cervical, external resorption, flap surgery

I. INTRODUCTION:
Root resorption is defined as the destruction and disintegration of the root structure of the tooth due to an autoimmune response resulting into the host tissue cells attacking a part of the tooth structure. There are two types of root resorption, i.e., 1) External root resorption and 2) Internal root resorption. Internal root resorption, also known as pink tooth of mummy is a type of pulp disease which is characterized by the loss of dentine as a result of the action of the osteoclastic cells stimulated by the inflammation of the pulp. External root resorption is a process that occurs in both vital and non vital teeth in which there is an irreversible loss of dentin, cementum and bone. Diagnosis of ERR is difficult owing to the fact that it is usually asymptomatic in the early stages and elicits pain only when the damage involves the pulp and periodontal tissues, and is only identifiable on a radiographic or clinical examination. External root resorption is usually physiological or pathological. Physiological root resorption is a desirable process, which usually occurs in primary teeth, since it results in the exfoliation of the deciduous teeth and thereby allows for the eruption of the permanent tooth. Whereas pathological resorption is associated with several local factors such as orthodontic therapy, trauma, periapical or periodontal inflammation, tumors, cysts , occlusal stress, impacted and supernumerary teeth and transplantation as well as systemic factors such as Paget’s disease of the bone, renal and hepatic disease and endocrine imbalances. Cervical external root resorption, also known as, invasive cervical resorption due to its invasive and aggressive nature on the dental tissues, is a pathological type of external root resorption. There is no known etiology of this pathology. Clinically, it only has a periodontal component involvement and not a pulp involvement and is difficult to diagnose. The only difference between the cervical external root resorption and the inflammatory type of root resorption is the formation of necrotic pulp tissues and pulp involvement. It usually occurs immediately below the epithelial attachment of the tooth and is not always cervical but along the pocket midline.

This Article describes a case of invasive cervical resorption without bone resorption and pulpal involvement in a medically compromised low risk [ASA Classification 3] (see table3) patient and describes the etiology and diagnostic components as well as the treatment modalities for this kind of clinical entity.

II. CASE HISTORY:
An 80 year old female was referred to the department of Periodontology at the UB School of Dental Medicine, Buffalo from the screening clinics for the evaluation and treatment of external root resorption on the buccal aspect of tooth #27 [see figure 1 and 2]. The patient had a complicated medical history [see table for medication and disease list]. The patient did not have any pain or symptoms at that appointment. Upon evaluation, it was noted that the root resorption defect was present on the buccal aspect of #27 and began 2mm midbuccal above the marginal gingiva and extended below the marginal gingiva. The tooth had a history of root canal treatment. The radiograph failed to depict any pathology on the tooth. However, upon probing, the extent of the resorption could not be judged. Hence, the treatment plan involved the reflection of a gingival flap in order to estimate the extent and depth of the defect. If upon exploration, the defect involved would be within restorable limits, the defect would then be restored with cement, and, if not, the tooth would then have to be extracted. The oral hygiene status of the patient was good; hence a surgery appointment was planned. At the surgery appointment, after the informed consent was obtained [oral and written], the site with respect to tooth no’s 26, 27 and 28 was injected with 2% xylocaine [1:100,000] epinephrine via local infiltration. Using a 15C blade, a sulcular incision was made from the mesial of #26 to 6mm distal to #27 on the buccal and lingual aspect. The flap was then reflected using a periosteal elevator and the defect was exposed [see figure 4]. A light cured glass ionomer cement was then placed into the defect and the defect was sealed[see figure 4]. The gingival flap was, then repositioned and the flap was sutured with 4-0 silk interrupted sutures. The patient was prescribed an
ibuprofen 400mg stat. The patient mentioned on the seventh day, that the sutures got loose and fell off by themselves and she also did not report of any discomfort during that period. The patient was then evaluated six months later, during which the resorption seemed stable and the defect did not increase [see figure 5]. Hence, the patient was placed on a 3 month periodontal maintenance from that visit onwards.

**Table 1: Medical History**

<table>
<thead>
<tr>
<th>Disease</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renal Disease</td>
<td>2000</td>
</tr>
<tr>
<td>Atrial Fibrillation</td>
<td>2002</td>
</tr>
<tr>
<td>Pacemaker implanted</td>
<td>2002</td>
</tr>
<tr>
<td>Hypertension</td>
<td>2000</td>
</tr>
</tbody>
</table>

**Table 2: Relevant list of Drugs**

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Class of drug</th>
<th>Purpose of the drug:</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digoxin</td>
<td>Cardiac glycosides</td>
<td>Congestive heart failure, atrial fibrillation, atrial flutter</td>
<td>Since 2002</td>
</tr>
<tr>
<td>Spirinolactone</td>
<td>Diuretic</td>
<td>Anti hypertensive and oedema</td>
<td>Since 2000</td>
</tr>
<tr>
<td>Furosemide</td>
<td>Loop diuretic</td>
<td>Congestive heart failure and oedema</td>
<td>Since 2000</td>
</tr>
<tr>
<td>Warfarin</td>
<td>Anti-coagulant</td>
<td>Prevention of thrombosis and thromboembolism</td>
<td>Since 2012</td>
</tr>
</tbody>
</table>

**Table 3: ASA Physical Status Classification**

ASA Physical Status 1 - A normal healthy patient
ASA Physical Status 2 - A patient with mild systemic disease
ASA Physical Status 3 - A patient with severe systemic disease
ASA Physical Status 4 - A patient with severe systemic disease that is a constant threat to life
ASA Physical Status 5 - A moribund patient who is not expected to survive without the operation
ASA Physical Status 6 - A declared brain-dead patient whose organs are being removed for donor purposes

Figure 1: Pre-operative view demonstrating the cervical resorption

Figure 2: Preoperative radiograph

Figure 3: Post flap reflection

Figure 4: Post restoration placement
III. DISCUSSION:

Clinically, external cervical root resorption appears as a pink spot on the cervical region of the tooth as a result of the resorption of the enamel and dentin leading to the seepage of the highly vascularized granulation tissue into the defect\(^1\). An important differential diagnostic factor is subgingival caries which does not produce a pink spot and is sticky on probing. The resorptive defect feels hard on probing\(^2\). This article describes a case of external cervical root resorption, which is usually idiopathic, and in our case too, did not have any known etiology. The root resorption extended subgingivally and hence, a gingival flap was needed for access. The etiologic factors associated with invasive cervical resorption are genetics, dental trauma, orthodontic treatment, intra coronal bleaching, periodontal therapy, and idiopathic etiology\(^3\). However, idiopathic etiology was a diagnosis in this case, since the patient denied any orthodontic therapy. Treatment modalities usually employ crating a gingival flap and restoring the defect\(^4\). The defect here was restored with a resin reinforced glass ionomer cement\(^5\) light cured restoration. In this case, tissue reattachment post surgery was a necessity. Studies have demonstrated that RGIC has displayed superior biocompatibility but has, however, interfered with the connective tissue attachment and new bone formation\(^6\). The patient in this case had a medical history of atrial flutter, hypertension, oedema and renal disease, hence the patient was classified as an ASA Class III patient, since the patient was stable and was not a high risk patient\(^7\). The patient denied a history of a myocardial infarction. It is advisable to minimize the stress in patients with cardiovascular disease, visiting the dentist as well as to provide an effective analgesic condition for treatment. There is a controversy laden as to whether or not to use a vasoconstrictor (adrenaline or levonordrphine) in conjunction with a local anesthetic solution, due to the vasoconstrictor's effect on the arterial pressure\(^8\). Patients who suffer from cardiac diseases usually consume anti hypertensive medications which result in the delay of the peripheral plasma clearance of the local anesthetic. Additionally, when these patient visit a dentist, the anxiety generated due to the visit results in the release of endogenous catecholamines in amounts that may exceed those administered with the local anesthetic solution\(^9\). Hence, the amount of a vasoconstrictor being administered should be reduced and limited to 0.04 mg of adrenaline (i.e., 2 anesthetic cartridges containing 1.8 mL of anesthetic with adrenaline 1:100,000). We administered a single capule of 2% xylocaine (1:100000) lidocaine for the entire procedure\(^10\). The use of antplatelet drugs such as aspirin, clopidogrel, ticlopidine, dipryridamole and anticoagulants like Coumadin's deserve special attention\(^11\). Should the need for the discontinuation of these thrombolytic agents be required, the decision to administer dental treatment must be taken after a medical consent is received\(^12\). However, if the antplatelet medication cannot be interrupted and a high risk of bleeding is anticipated, then hemostatic measures such as sutures, electric or laser scalpel must be kept handy. Periodontal surgeries are classified as minor surgical procedures and hence, it does not require the interruption of the anti-platelet drug\(^13\). Literature has made a mention to practitioners to avoid the employment of certain dental devices such as ultrasonic scalers, cleaning systems and select composite curing lights in cardiac pacemaker patients\(^14\). These devices generate electromagnetic interference which may interfere with the normal functioning of the pacemaker. Ultrasonic cavityon scalers (Dentsply) have been shown to interfere with pacemaker activity at a distance of 15 cm in an in vitro study\(^15\). Although, the newer pacemakers are relatively smaller and have greater protective features, there are still several devices that may interfere with the function of the pacemaker. It is recommended to advocate the use of hand instruments in such patients and keep the working area safe from any electronic units. In this case, we used hand instruments for debriding the periodontal region and the light composite curing unit was assumed safe to be utilized in a cardiac pacemaker patient\(^16\). The limitations in this paper involve the discussion of a single case only and with very few cases in literature on this topic, more cases would be required in order to warrant the success of performing such procedures. Additionally, we only had a six month follow up on this patient. In order to evaluate if resin modified glass ionomer cement is an ideal cement for external cervical resorption defects repair, longer follow ups should be encouraged. Also, studies should be conducted regarding the various light curing units to establish which units are safer over the others, especially since the one used in this study was assumed safe to be utilized in a cardiac pacemaker patient since its usage in the past has not demonstrated any negative effects on such patients.

IV. CONCLUSION:

The key to a successful external root resorption therapy lies in a good case selection as well as early diagnosis. If an early diagnosis is established, the tooth also has a good prognosis.

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VI. REFERENCES


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