Surgical endodontic management of external root resorption
Avinash Ramchandra Salgar, Manoj G. Chandak, Narendra U. Manwar

Abstract
External apical root resorption in permanent dentition is usually pathological. Local factors are the most frequent causes of resorption, especially excessive pressure and inflammation. Depending upon the extent of resorption and etiology, different treatment regimens have been proposed. This paper reports the management of maxillary central incisor with external root resorption.

Key words: External Root Resorption; Endodontics; Maxillary Central Incisor.
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Introduction
Tooth resorption results from injuries to or irritation of the periodontal ligament and / or tooth pulp. (1, 2) It may arise as sequelae of traumatic luxation injuries, orthodontic tooth movement, or chronic infections of pulp or periodontal structures, neoplastic process, associated with systemic diseases and lesions of idiopathic origin. (2) The treatment goal in the external apical root resorption is to remove or destroy bacteria to allow healing to take place in the periradicular space. (3)
Classifications play an important role for the clinician in the process of diagnosis and treatment planning. Andresen has made a unique contribution to the understanding of tooth resorption following dental trauma and his original classification remains the most widely accepted i.e. tooth resorption into internal (inflammatory and replacement) and external (surface, inflammatory, replacement). (4) Different materials available for management of external tooth resorptions are, a) mineral trioxide aggregate (MTA), b) Glass ionomer cement, c) Super EBA (a reinforced zinc oxide cement; its liquid contains 32% eugenol and 68% ethoxy benzoic acid), d) Hydrophilic plastic polymer (2-hydroxyethyl methacrylate with barium salts), e) Zinc oxide eugenol and zinc acetate cement, f) Amalgam alloy and g) Thermo plasticized gutta-percha administered either by injection or condensation techniques. (5, 6) The present case report explains the successful management of external root resorption of root with surgical approach and M.T.A.

Case Report
A 21 years old female patient with non-contributing medical history, reported with the chief complaint of gingival swelling and discharge of pus from upper front region. On clinical examination, a gingival swelling of 1.5x1.5 cm was seen in relation to11 along with gingival inflammation (Fig.1). Multiple sinus tracts were traced using gutta-percha points. On radiographic examination a large radiolucency perforating the external root surface at mid root level was seen.
Access opening was done with 11, diagnostic radiograph was taken (Fig1b) and sectional obturation was done till the defect. A full thickness periosteal flap was raised and defect was exposed (Fig 1c) and thorough cleaning of the defect was done and irrigation was done with diluted Citric acid and final rinse was done with normal saline. Fresh white M.T.A. was mixed with distilled water on mixing pad. Mixed M.T.A. was condensed in defect area with the post placed in canal (Fig 1d). Flap was repositioned and sutures were placed. After initial setting of M.T.A. a glass fiber post was luted in the canal with dual cure composite (Fig.1e). Patient was periodically observed for 1 year. On recall examination there was healthy gingiva with repair of external defect with 11 was observed.

Discussion
Successful treatment of perforations depends mainly on the immediate sealing of the perforation and prevention of infection. (7, 8) Factors, such as time elapsed since the perforation and size of the perforation, (9) as well as the repair material (4) are important for a better prognosis following perforation. Another important factor is the location of the perforation as the more apical the perforation, better the prognosis, the more coronal the perforation, lesser the prognosis.
This is due to the fact that perforation of the crown or root causes an inflammatory process which causes break down of the periodontium which may extend to the gingival sulcus, producing a deep and un-manageable periodontal defect, the chances of which is higher when the perforation is coronal as compared to one that is apical. (10) Root lesions caused by external root resorption have been treated with different techniques and materials. In this case, after resorption lacuna was exposed surgically, the root canal treatment was subsequently performed because the root resorption was in relation with the root canal. (3)

MTA is a fine powder primarily composed of tricalcium silicate, tricalcium aluminate, tricalcium oxide, and silicon oxide that, upon hydration forms a colloidal gel that solidifies in approximately 3 hours. (10) Therefore, when used as a root repair material, moisture must be provided from the internal aspect of the root. MTA was used because of its reported ability to provide a biocompatible surface for the possible adhesion/attachment of bone and cementum. (11) In addition, MTA inhibits the activity of bacteria, is not affected in the presence of moisture and blood, and also is able to harden and form a barrier because of its hydrophilic characteristic. (12) Moisture in the surrounding tissue acts as an activator of a chemical reaction in this material. (13)

Conclusion

Tooth resorption is a perplexing problem for all the dental practitioners. Although the occurrence of resorption cannot be predicted, resorption is identified accidently on radiograph. However, even this diagnostic tool has limitations, especially with respect to resorption on the buccal and lingual surfaces. The diagnostic dilemma is further complicated by the need to differentiate between internal from external resorption. Various type of materials are available having limitation to treat resorption defect. According to the type and extent of lesion, clinician should decide the appropriate materials.

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