

MULTIDISCIPLINARY APPROACH FOR MANAGEMENT OF EXTERNAL ROOT RESORPTION IN MAXILLARY CANINE : A CASE REPORT

Case Report

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ABSTRACT : The reaction of dentoalveolar apparatus in the presence of an infection cause an inflammation which is followed by tooth resorption. Depending upon the type of resorption and etiological factors, different treatment modalities are present. An incorrect diagnosis may result in inappropriate treatment. So, in this case, use of cone beam computed tomography for a definite and correct diagnosis has been done. The use of low-level laser (soft-tissue laser) has been seen effective in cases of root resorption because of their bactericidal effect on osteoclast cells. These cells had been seen at the site of resorption. The perforation site can be covered with amalgam, composite resins, glass ionomer cement, and more new advanced material, mineral trioxide aggregate (MTA). The present article is the case report about the surgical management of external root resorption by using soft-tissue laser and MTA filling material in an endodontically treated maxillary canine.

Keywords:

External root resorption,
Diode laser, Mineral
trioxide aggregate (MTA),
Cone beam computed
tomography (CBCT).

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INTRODUCTION: Root resorption is the process of the removal of cementum and/or dentine through physiological or pathological activity of tooth resorbing cells, which may be called dentoclasts. There are two types of tooth resorption: internal and external resorption.¹ Root resorption is always remains a big concern to the endodontist. Dentists can face difficulties with its diagnosis and treatment decision.² Root resorption can be classified depending on its location in respect to the root surface. External root resorption (ERR) can be further classified into surface resorption, external inflammatory resorption, external replacement resorption, external cervical resorption, and transient apical breakdown.³ External root resorption is a process that occurs both in a vital and nonvital teeth, in which there is a irreversible loss of dentin, cementum and bone.⁴

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. High-resolution 3-dimensional images have improved dental diagnoses. Several studies have investigated the possibility of accurately detecting dental lesions on tooth surfaces and the periapical area by using cone beam computed tomography (CBCT).⁵ The diode laser has become the most commonly utilized laser in dentistry. While diodes include wavelengths from 800 through 1064 nanometers, the 810 devices predominate. Diode lasers have many advantages over traditional surgical and therapeutic techniques including less pain, faster healing and new applications. Every specialty area of dentistry can

utilize the powers of laser energy.⁶ Besides the antimicrobial effects, those lasers also are able to cause morphological changes on root surfaces, which improve the cell's adhesion and proliferation and subsequent attachment of periodontal tissues.⁷

Surgical management of external root resorption involves periodontal flap reflection, curettage, restoration of the defect with amalgam, composite resin or glass ionomer cement followed by flap repositioning to its original position. Use of mineral trioxide aggregate (MTA) in sub-gingival areas has also been suggested to prove beneficial.⁸ Recently mineral trioxide aggregate (MTA) has emerged as a reliable material due to its biocompatibility, good sealing property, and it encourages regeneration of peri-radicular tissues such as periodontal ligament bone and cementum. These favorable properties render MTA a suitable material for the management of tissues damage caused by ERR.^{9,10} This case reports a case of a permanent maxillary canine with external resorption treated with laser application and MTA.

CASE REPORT: A 38 year old male patient reported to the Department of Conservative Dentistry and Endodontics, K. D. Dental College and Hospital Mathura with a chief complaint of pain and sensitivity to hot and cold in right upper front tooth region of mouth since 6-7months. Patient gave history of an accident five months ago in respective region. Clinical examination revealed right maxillary canine was grade I mobile and tender on percussion. Electrical pulp vitality test was positive for that respective tooth. On radiographic examination, right sided maxillary canine showed radiolucency in the middle root surface (Fig.1).



Fig.1: Pre operative Radiograph

Access opening was done after rubber dam isolation under local anaesthesia. Working length was determined with #10K-file. Biomechanical preparation was done till #40K-file. Irrigation was done with 3% NaOCl, 17% EDTA, and normal saline. Calcium hydroxide dressing was given for three weeks. CBCT was advised to differentiate between external and internal resorption.

CBCT report showed break in the continuity of enamel and dentin present in the gingival third region of root, labial in position in relation to right maxillary canine. It is irregular in outline, suggestive of external root resorption (Fig.2).

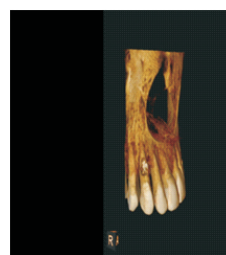


Fig.2: CBCT Image

Hence, a diagnosis of ERR was made with respect to the right maxillary canine. Immediate treatment was planned to help arrest the invasive nature of the lesion and restore the defect efficiently. A surgical approach was planned and the defect was curetted and disinfected with the laser followed by restoration with mineral trioxide aggregate. After administration of local anaesthesia, envelop incision was given and full thickness mucoperiosteal flap was raised labially, such that it provided complete access to the labial aspect of the defect. Granulation tissue was visualized and curettage was done.

Disinfection of the lesion and canal was done with the help of laser (A.R.C., Nuremberg, Germany) (Fig.3).



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Fig.4: Immediate Post-operative Radiograph After Coronal Restoration

DISCUSSION: Tooth resorption is a pathologic condition that still remains a mystery in many aspects. It may go unnoticed over many years as most cases of resorption are asymptomatic in nature. Early detection of resorption is essential for successful management. Besides clinical examination and periapical radiographs, several studies have confirmed the usefulness of CBCT in the diagnosis of resorption.^{10,11}

External root resorption can seriously jeopardize the longevity of a tooth causing its early loss. Therefore, early diagnosis is extremely crucial in the management of ERR because sooner the treatment is done, less severe will be the long-term consequences of resorption.¹² CBCT was superior to digital periapical radiography in diagnosing external and internal inflammatory root resorption after dental trauma and can be considered in the differential diagnosis of resorptive lesions in teeth with endodontic treatment.¹³

Treatment depends on the severity, location, whether the defect has perforated the root canal system, and the restorability of the tooth. Essentially, treatment involves complete removal of the resorptive tissue and restoring the resulting defect with a plastic tooth-colored restoration.³

Disinfection of canal microorganisms remains a goal of successful endodontic treatment. However, complete elimination of microorganisms from the root canal system is not possible simply with biomechanical preparation of the root canal. Hence $\text{Ca}(\text{OH})_2$ was used as intracanal medicament.¹⁴

In recent years, bacterial resistance has been identified as one of the causes of endodontic failure. A diode laser with a wavelength of 810 nm demonstrated bacterial reduction, regardless of antibiotic resistance or traditional irrigants.⁶

A surgical approach with exposure of the resorption defect has also been advocated. In our case, the treatment involved removal of pathologic tissue from the defect and restoration of the resorption cavity.⁴ MTA is a biocompatible cement, which has good sealing ability, and is moisture tolerant. When MTA was used to seal perforations in the furcal area, it induced the repair of the periodontium and new cementum formation over the material.¹ So, In this case report combination of laser and MTA was used in the treatment of external root resorption.

CONCLUSION : The most successful approach in management of external root resorption includes multidisciplinary treatment by using both soft-tissue laser and MTA filling material in an endodontically treated tooth.

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