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Case Report

Surgical approach for management of maxillary incisor with internal root resorption and apical obliteration: A case report

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Abstract

Internal root resorption (IRR) is the progressive reduction of intra-radicular dentin along with dentinal tubules because of osteoclastic activity. It is usually seen in the pulp space of molars and incisors as a radiolucent area. The prognosis of tooth to be treated endodontically can get complicated if perforation is present as it weakens the remaining dental structure and can lead to periodontal infection. A male patient reported with chief complaint of pain on biting and presence of gingival swelling in upper left central incisor. Radiograph indicated the presence of internal root resorption and apical obliteration. This case report describes the management of maxillary incisor with apical obliteration and internal root resorption by surgical approach followed by thermoplasticized gutta-percha obturation.

Keywords: Cone beam computed tomography, Internal resorption, Mineral trioxide aggregate, Platelet rich fibrin

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1. Introduction

Resorption is defined as a condition associated with either a physiologic or a pathologic process resulting in loss of dentin, cementum or bone. Classification by Andreasen on tooth resorption includes Internal (Inflammatory, Replacement) and External (Surface, Inflammatory and Replacement).[1]

Internal root resorption (IRR) is the progressive reduction of intraradicular dentin and dentinal tubules of the root canal walls because of osteoclastic action. It is usually seen around the pulp cavity of incisors and molars as a radiolucent area. Orthodontic treatment, traumatic injury and infection are the major causes of internal resorption.[2,3]

The two stages of resorption are: degradation of inorganic structure followed by breakdown of organic matrix.[4,5] Clinically, a pink spot (reddish area) can be present which shows the granulation tissue in the affected tooth. For the diagnosis of internal resorption X-rays are mandatory, which reveals pulp space having round-to-oval radiolucent area with smooth and clearly defined margins along with distortion of the original root canal outline.[1,3]

Most common biomaterial used for restoring the resorbed area of teeth is Mineral Trioxide aggregate (MTA) as it is biocompatible, has excellent ability to sealing along with cementogenic and osteogenic properties.[6,7] Other than MTA, materials like biodentine and Endosequence root repair material can also be used.

Hence, the clinician needs to be familiar with the modalities of treating cases of resorption. This case report describes the management of maxillary incisor with apical obliteration and internal root resorption by surgical approach followed by thermoplasticized gutta-percha obturation.

2. Case Report

A male patient of age 32 years with no systemic condition reported in our clinic Raj Dental Avenue with a chief complaint of pain on biting and presence of gingival swelling in upper front tooth region from past seven days. Patient

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reported with a history of trauma eight years back. Patient also informed that he has undergone root canal treatment of maxillary left central incisor two months back from another clinician which was not completed. Clinically a small gingival swelling was present labially without any patent sinus. Clinically maxillary left central incisor was having a temporary restoration. No noticeable mobility was present. Tender on percussion was positive and electric pulp test showed delayed response compared to contralateral and adjacent teeth.

2.1. Radiograohic examination

Radiographically, the left maxillary central incisor exhibited periodontal ligament widening at the middle third of the root mesially and a large oval (ballooning out) shaped radiolucency involving the root canal. Radioopacity was evident in the coronal portion of the root and some of the crown portion suggestive of intracanal medicament.(**Figure 1a)**

After the clinical and radiographic examination, diagnosis of previously initiated therapy was made. Patient was advised to get the root canal therapy completed and his consent was obtained. Temporary restoration was removed using airrotor under rubber dam isolation. The access was prepared with Endo access bur (Dentsply Sirona). While taking the working length the canal was not getting negotiated completely because of the ledges created during previous treatment.**(Figure 1b)**

So, to rule out any possibility of perforation of buccal or palatal wall, patient was asked to get a Cone bean computed tomography (CBCT) evaluation done. CBCT images showed that the dimension of internal resorption buccopalatally was 3.7mm, mesiodistally it was 3.6mm and coronoapically it was 6.6mm. Also, the external radiolucency had the dimensions of 1.4mm buccopalatally, mesiodistally it was 2.0mm and coronoapically it was 4.4mm. Also, CBCT revealed that no perforation was present.**(Figure 1c-g)**

Then circumferential filing was done using #40K hand file. Sodium hypochlorite and saline irrigation was done and was activated using sonic irrigator. Then absorbent paper points were used to dry the canals and calcium hydroxide dressing was placed. Temporary restoration (Tempfil-G, Shivam industries, Jammu, India) was used to seal the access cavity.

After using calcium hydroxide as an intracanal medicament there was a lateral canal/ communication between the external radiolucency and internal resorption. So, it was planned to obturate the coronal portion of the canal prior to the surgical management of apical portion.

Patient was recalled after 7 days and the temporary restoration was removed. Canal was again irrigated using saline and then dried. Obturation was done by first applying a coat of Sealapex sealer (Sybron endo, Kerr) on the walls and then with thermoplastisized gutta percha using Calamus (Dentsply Maillefer, Switzerland). Composite (Ivoclar Te-Econom Plus) was used for restoration of access cavity post obturation.**(Figure 1h-i)**

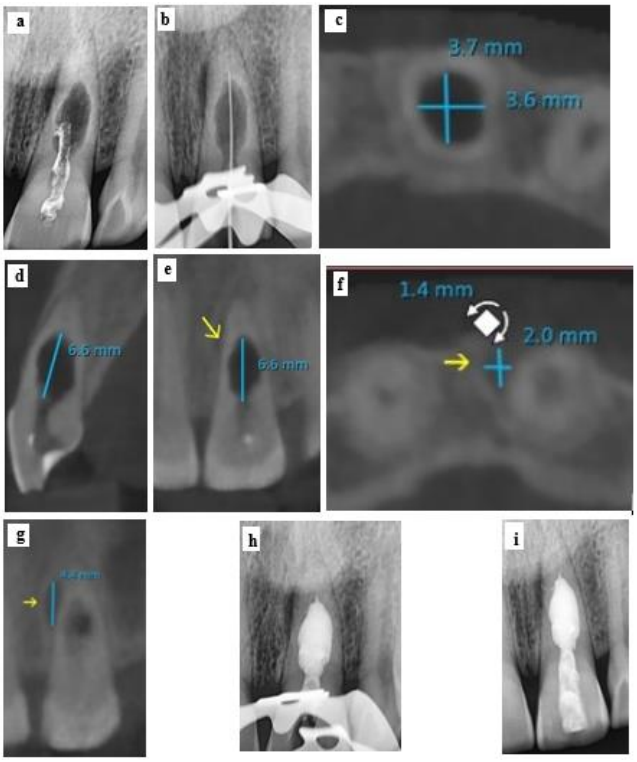

Figure 1: a: Pre-op x-ray; **b:** working length X-ray; **c-g:** CBCT images of the internal resorption and external radiolucency; **h:** thermoplasticized obturation; **i:** post-op X-ray.

As, the apical end was inaccessible surgical approach was taken to do apicoectomy. After the obturation local anaesthesia (2% lignocaine) was administered.**(Figure 2a)** A triangular flap with sulcular incision was raised which involved distal of 11 to distal of 22.**(Figure 2b)** Osteotomy was done using a round bur to make a small bony cavity of about 5 mm.**(Figure 2c)** Root tip of 3mm was resected with a long tapered bur.**(Figure 2d)** Then root end cavity preparation was made using ultrasonic tip of size KiS 2D.**(Figure 2e-f)** Then after irrigating it with 5% povidone iodine solution and saline, the root end cavity was dried and MTA (MTA Angelus) was placed inside the cavity as well as on the resorption on the external surface of tooth.**(Figure 2g)** Before the procedure centrifugation at 3000 rpm for 10 minutes was carried out with 10 ml of venous blood in order to obtain platelet rich fibrin (PRF). After placing the MTA, cavity was filled with PRF.**(Figure 2h)** Flap was placed back and sutured by placing simple interrupted sutures with 3-0 silk suture.**(Figure 2i)** After 7 days patient was recalled for suture removal and the healing was uneventful.**(Figure 2j)** A follow up was conducted after 1 year for the patient, in which the bone formation was seen in the periapical area of the apex of the tooth and the middle third of the root where external resorption of tooth was present previouslly.**(Figure 2k)**

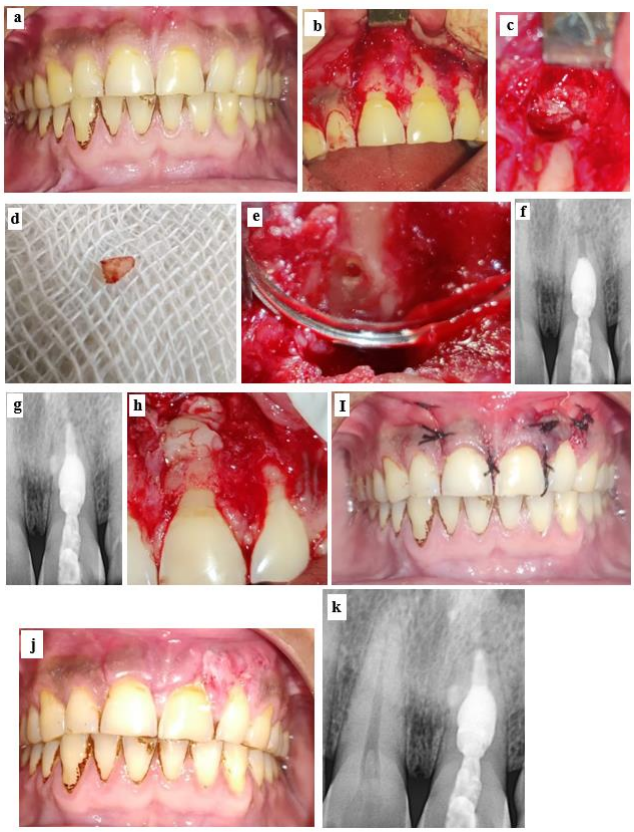

Figure 2: a: Pre-op clinical picture; **b:** Flap elevation; **c:** Osteotomy window; **d:** Resected root tip; **e:** Root end cavity; **f:** X-ray of root end cavity; **g:** X-ray after MTA placement; **h:** PRF placement; **i:** suturing with 3-0 silk suture; **j:** 7 days follow up after suture removal; **k:** Follow up X-ray after 1 year.

3. Discussion

Clinicians often get in dilemma while treating a tooth of questionable prognosis. The prognosis of tooth to be treated endodontically can get complicated if perforation occurs as it weakens the remaining dental structure and can lead to periodontal involvement. However, the use of biomaterials can influence the prognosis of the tooth. The first case of internal resorption was reported by Bell in 1830.[8] Since then adequate documentation on internal resorption has been reported. Presence of pulp inflammation and osteoclastic precursor cells in blood vessels are the contributing factors of internal resorption. Treating a case of internal resorption is done by eradicating the blood supply endodontically.[2]

Radiographically IRR shows a ballooning out or oval shaped radiolucency within the root canal. However, conventional X-rays are not sufficient for diagnosis of the IRR. It is always recommended to take multiple angulated X-rays if IRR is suspected, as it is important for proper diagnosis and in planning appropriate treatment of the tooth. Also, Cone beam computed tomography (CBCT) has given an upper hand in evaluating the severity of lesions, such as in this case. CBCT also aids in diagnosing and managing these lesions more efficiently.[9]

Platelet rich fibrin (PRF) is used widely as it stimulates growth factors and proteins continuously. It has become an ideal biomaterial for wound healing of large periapical lesions and it can be easily prepared from the patient's own blood. Therefore, after the apicoectomy PRF was placed on the surgical site.[10]

Various materials that can be used for the treatment of internal root resorption are MTA, biodentine, glass ionomer cement, Super EBA, hydrophilic plastic polymer (2-hydroxyethyl methacrylate with barium salts), zinc oxide eugenol and zinc acetate cement, amalgam alloy, composite resin and thermoplasticized gutta-percha administered either by injection or condensation techniques.[11]

In a similar case by Eduardo N et al. of a maxillary lateral incisor with advanced perforating internal root resorption in the middle third of the root, he used MTA to fill the resorption area after root canal therapy of the apical segment. The follow-up after 11 years and 8 months showed that the patient was clinically asymptomatic and the radiographic examination and computerized tomography indicated periodontal bone repair.[12]

In this case internal resorption was seen in maxillary incisor along with obliteration in apex. As the canal was not getting negotiated, apicoectomy was carried out of the apical end and MTA was used to seal the apical end cavity because of its biocompatibility, ability of sealing along with cementogenic and osteogenic properties. A three-dimensional seal was obtained by obturating the resorptive defect with thermoplasticized gutta-percha. Then follow up after 1 week was done first to check for the soft tissue healing and then after 1 year to check for the bone formation.

4. Conclusion

Regular follow-ups with periodic X-rays and thermal test are imperative for early diagnosis and management of internal root resorption. Internal resorption starts from the canal and then progress towards the surrounding structures to destroy them. It is easy to control the process of internal root resorption by eradicating the blood supply. CBCT imaging for proper detection and extent of lesion is always recommended for efficient management of such lesions.

5. Source of Funding

None.

6. Conflict of Interest

None.

References

1. Tronstad L. Root resorption-etiology, terminology and clinical manifestations. *Endod Dent Traumatol.* 1988;4(6):241–52.
2. Patel S, Ricucci D, Durak C, Tay F. Internal root resorption: A review. *J Endod*. 2010;36(7):1107–21.

3. Silveira FF, Nunes E, Soares JA, Ferreira CL, Rotstein I. Double ‘pink tooth’ associated with extensive internal root resorption after orthodontic treatment: A case report. *Dent Traumatol.* 2009;25(3):e43–7.
4. Bhaskar SN. Orban's oral histology and embryology. 10th ed. St. Louis: C. V. Mosby. 1986:206–8.
5. Fernandes M, de Ataide I, Wagle R. Tooth resorption part I-pathogenesis and case series of internal resorption. *J Conserv Dent*. 2013;16(1):4–8.
6. Torabinejad M, Chivian N. Clinical applications of mineral trioxide aggregate. *J Endod*. 1999;25(3):197–205.
7. Economides N, Pantelidou O, Kokkas A, Tziafas D. Short-term periradicular tissue response to mineral trioxide aggregate (MTA) as root-end filling material. *Int Endod J*. 2003;36(1):44–8.
8. Bell T. The anatomy, physiology, and disease of the teeth; Philadelphia: Carey and Lee Publishing; 1830:171–2.
9. S. Patel, A. Dawood, R. Wilson, K. Horner, and F. Mannocci. The detection and management of root resorption lesions using intraoral radiography and cone beam computed tomography—an in vivo investigation. *Int Endod J*. 2009;42(9):831–8.
10. Choukroun J, Diss A, Simonpieri A, Girard MO, Schoeffler C, Do han S et. al. Platelet-rich fibrin (PRF): A second-generation platelet concentrate. Part IV: Clinical effects on tissue healing. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2006;101(3):56–60.
11. Mittal S, Kumar T, Mittal S, Sharma J. "Internal root resorption: An endodontic challenge": A case series. *J Conserv Dent*. 2014;17(6):590–3.
12. Nunes E, Silveria FF, Soares JA, Duate MAH, Soares SMCS. Treatment of perforating internal root resorption with MTA: a case report. *J Oral Sci*. 2012;54(1):127–31.

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