CASE REPORT

Treatment of maxillary central incisor with external root resorption using mineral trioxide aggregate: 18 months follow-up

Padma Gandhi,¹ Saraswathi Disha²

¹Department of Conservative Dentistry & Endodontics, SVS Institute of Dental Sciences, Mahabubnagar, Andhra Pradesh, India

²Department of Conservative Dentistry & Endodontics, Dr. Sudha Nageshwara Rao Institute of Dental Sciences, Vijayawada, Andhra Pradesh, India

Correspondence to

Dr Padma Gandhi,
padmagandhi@gmail.com

SUMMARY

External cervical resorption is the loss of dental hard tissue as a result of odontoclastic action; it usually begins on the cervical region of the root surface of the teeth. This case report demonstrates an external cervical resorption in a maxillary central incisor of a 24-year-old male patient. After surgical intervention and root canal treatment, the resorption was subsequently sealed with mineral trioxide aggregate. The 18 months follow-up demonstrates no pathological changes on clinical and radiographic examination. This case report presents a treatment strategy that might improve the healing outcomes for patients with external cervical resorption.

BACKGROUND

External root resorption is a destructive loss of tooth structure, initiated by a mineralised or denuded area of the root surface. Potential predisposing factors for external root resorption are orthodontics, trauma, intracoronal bleaching, surgical procedures, periodontal therapy and other factors: bruxism, intracoronal restorations, developmental defects and systemic diseases.¹

Guided tissue regeneration is a well-documented periodontal regenerative surgical technique that involves the placement of a membrane between the root surface and the mucoperiosteal flap. This technique favours the periodontal ligament and bone cells to repopulate at this area.²

CASE PRESENTATION

A 24-year-old male patient presented with pain in the upper left central incisor and occasional pus discharge from the buccal vestibule in the same region. The patient had a history of trauma 8 years previously. The medical history of the patient was unremarkable. On clinical examination, tooth #9 revealed grade I mobility, which was tender on percussion, with a probing depth of 8 mm (figure 1). Periapical radiographs showed an external root resorption on the middle third of the root of maxillary left central incisor, which was not in relation with the root canal (figure 2).

TREATMENT

Rubber dam isolation was performed. The access cavity preparation was shaped with a round diamond bur. The canal was prepared to size 40 by using K-files (Maillefer instruments SA). Sodium hypochlorite at 5.23% was used to irrigate the canal in-between each instrumentations, by using a

Figure 1 Preoperative photograph.

side vented endodontic needle (27-gauge). Normal saline solution was used to irrigate at the end of the procedure to remove the smear layer. Using lateral condensation technique at the second appointment, obturation was performed (figure 3). Local infiltration anesthesia was performed on the vestibular and palatal mucosa. An intrasulcular incision was made from the mesial surface of maxillary left canine to the distal surface of maxillary right canine; both buccal and palatal full-thickness mucoperiosteal flaps were elevated. Granulomatous

Figure 2 Preoperative radiograph.

To cite: Gandhi P, Disha S. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2013-200241

Figure 3 Obturation radiograph.

Figure 6 Immediate radiograph after surgery.

Figure 4 Exposure of the defect.

tissue within the defect area was removed by 4R/4L curette (Hu-Friedy, Chicago, Illinois; figure 4). The area was rinsed with sterile saline solution. The root surface was planed with hand and ultrasonic instruments; irrigation was carried out and was closed with MTA (ProRoot, Maillfer, Dentsply, Switzerland;

figure 5). The root surface was conditioned with tetracycline hydrochloride (250 mg/5 mL saline) for 2 min (figure 3). Later, the bony defect was restored with bone graft (Perioglas, Novabone, Jacksonville , Florida). Suturing was conducted and radiograph was taken immediately after periodontal therapy (figure 6).

OUTCOME AND FOLLOW-UP

Eighteen months follow-up radiograph showed a good healing of the lesion with no periapical changes (figure 7).

Figure 5 Mineral trioxide aggregate packed into the defect.

Figure 7 Eighteen months follow-up radiograph.

DISCUSSION

Root lesions caused by external root resorption have been treated with different techniques and materials. Smidt *et al*³ presented a successful treatment by using an interdisciplinary approach with orthodontic root extrusion, endodontic treatment and restorative means. Hiremath *et al*⁴ used glass ionomer cement for the treatment of invasive cervical resorption. MTA, which 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.⁵ Moisture in the surrounding tissue acts as an activator of a chemical reaction in this material.

Learning points

- ▶ Mineral trioxide aggregate (MTA) has many good sealing characteristics, biocompatibility, bactericidal effect and radiopacity.
- ▶ MTA 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.
- ▶ MTA inhibits the activity of bacteria.
- ▶ MTA can provide a biocompatible surface for the possible adhesion/attachment of bone and cementum.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Frank AL, Torabinejad M. Diagnosis and treatment of external invasive resorption. *J Endod* 1998;24:500–4.
- 2 Nyman S, Gottlow J, Lindhe J, *et al*. New attachment formation by guided tissue regeneration. *J Periodontol Res* 1987;22:252–4.
- 3 Smidt A, Nuni E, Keinan D. Invasive cervical root resorption: treatment rationale with an interdisciplinary approach. *J Endod* 2007;33:1383–7.
- 4 Hiremath H, Yakub SS, Metgud S, *et al*. Invasive cervical resorption: a case report. *J Endod* 2007;33:999–1003.
- 5 Arens DE, Torabinejad M. Repair of furcal perforations with mineral trioxide aggregate: two case reports. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1996;82:84–8.

Copyright 2013 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow