

CASE REPORT

Management of an Anterior Tooth with External and Internal Resorption

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ABSTRACT

Tooth resorption is a condition associated with either a physiologic or a pathologic process resulting in a loss of dentin, cementum, and/or bone. Inflammatory process is initiated when the predentin or precemental layer of the tooth is damaged. Resorption can either be external or internal in form. In order to control the tooth resorption, it is necessary to treat the root canal by removing all the pulp tissue. Due to varied root canal morphology, root canal treatment poses a challenge for the clinician. In such cases a combination of conventional lateral compaction and thermoplasticized gutta percha can enable the three-dimensional obturation of the canal space. This case report describes a nonsurgical mode of management of a tooth having internal and external (surface) resorption.

Keywords: External, Gutta percha, Internal, Resorption, Thermoplasticized.

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INTRODUCTION

Tooth resorption is a condition associated with either a physiologic or a pathologic process resulting in a loss of dentin, cementum, and/or bone. Inflammatory process is initiated when the predentin or precemental layer of the tooth is damaged.^{1,2} Resorption can either be external or internal in form. External root resorption can occur due to excessive orthodontic force, certain pathological processes, or as a sequelae of replantation of avulsed tooth (replacement resorption).³ It leads to shortening of the root length, thus compromising the crown-root ratio in addition to progressive weakening of the root, which has an impact on its long-term sur-

vival. Internal resorption, on the contrary, occurs due to chronic pulpal inflammatory processes or following certain restorative procedures and pulpotomy.³ It has an insidious pathology and can progress to a great extent before being detected. It is associated with a varied root canal morphology which complicates the treatment procedure. When the condition is detected at an early stage and adequate treatment procedures are initiated, the resorptive process can be arrested, thus improving the prognosis of the tooth.

In order to control the tooth resorption, it is necessary to treat the root canal by removing all the pulp tissue. In such cases a combination of conventional lateral compaction and thermoplasticized gutta percha can enable the three-dimensional obturation of the canal space. This case report describes a nonsurgical mode of management of a tooth having internal and external (surface) resorption.

CASE REPORT

A 21-year-old female patient reported with a complaint of discoloration of the upper front tooth (11) (Fig. 1). Patient gave a history of fixed orthodontic treatment for the past 2½ years and denied any episode of trauma. Patient was moderately built and the medical history was noncontributory. The surrounding soft tissues appeared to be normal. Clinical examination revealed a slight yellowish discoloration of 11. The tooth was tender to percussion and vitality testing was negative. Mobility was within physiologic limits. Radiographic examination by an



Fig. 1: Preoperative clinical view

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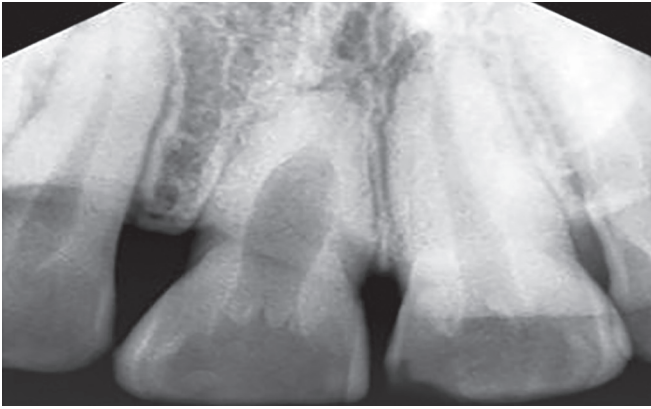


Fig. 2: Preoperative radiograph

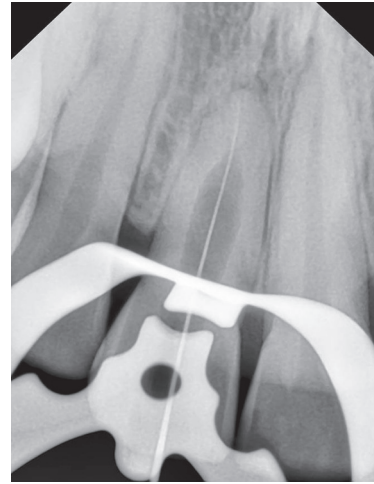


Fig. 3: Estimation of working length

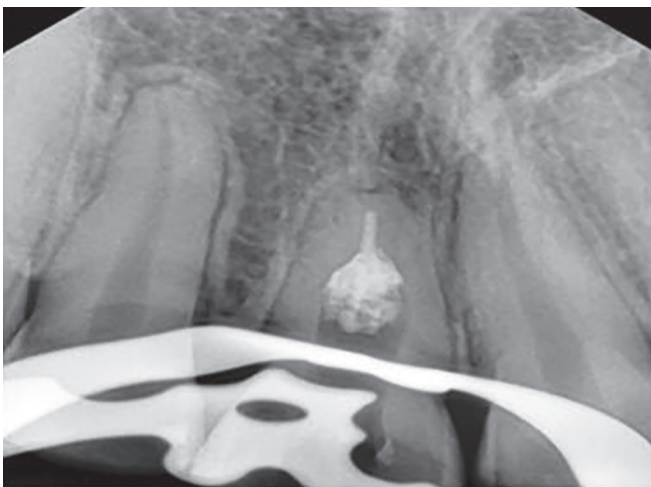


Fig. 4: Shearing of gutta percha at apical third

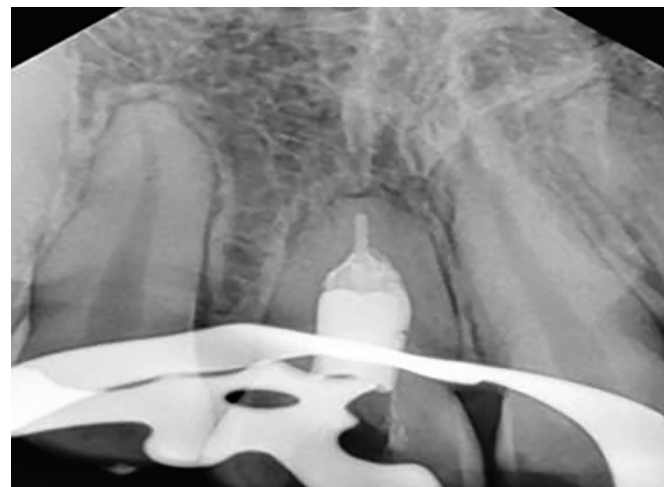


Fig. 5: Thermoplasticized obturation

intraoral periapical radiograph of 11 revealed a wide root canal space starting from the coronal third and extending toward the apical third of the canal with narrowing of the canal in the apical area (Fig. 2). Root length of 11 was significantly less than 21 and the apical outline was irregular. From the clinical and radiographic findings, a diagnosis of internal root resorption along with external root resorption of 11 was made.⁴

TREATMENT

Access opening was made wider to gain proper access to the widened root canal space. The working length was measured (Fig. 3) and the apical canal preparation was done up to K-file 35 size. Cleaning and shaping of the root canal was done using the step back technique and canal was copiously irrigated with 3% sodium hypochlorite. A nonsetting calcium hydroxide dressing (calcium hydroxide powder mixed with chlorhexidine) was placed for a period of 15 days. At the 15-day interval, the canal was reassessed. Since slight exudation was present, another

calcium hydroxide dressing was placed for a further period of 15 days.

After 30-day interval, the calcium hydroxide dressing was completely removed, followed by irrigation with 3% NaOCl, 17% ethylene diamine tetraacetic acid (EDTA) and normal saline used as the final irrigant. Master cone corresponding to K-file 35 size was placed to the working length. Apical one-third of the root canal was then obturated with cold lateral compaction technique using an epoxy-amine resin-based sealer (AH Plus, Dentsply) and the gutta percha cones were sheared at the junction of the apical and middle third of the canal with a heated plugger and compacted using an appropriately sized hand plugger, thus retaining a 4 mm apical segment of gutta percha (Fig. 4). The remainder of canal was backfilled using thermoplasticized gutta percha with a warmed gutta percha obturation system (E and Q Plus, Meta Biomed) (Fig. 5). Warm gutta percha at the orifice was vertically compacted by using appropriate-sized pluggers. After completion of root canal obturation the orifice was sealed with a layer of type II glass ionomer

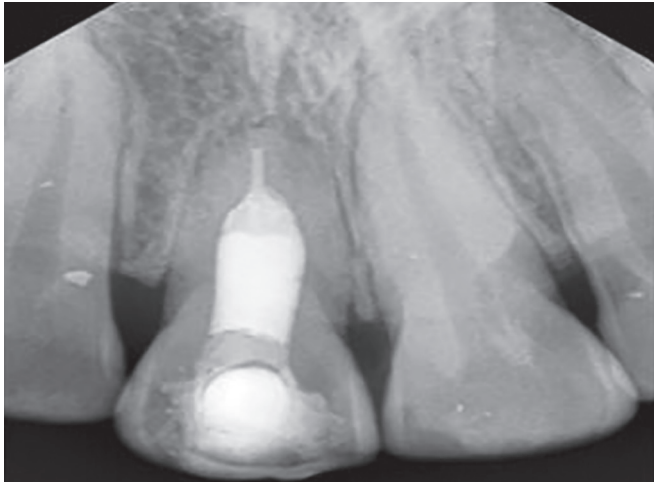


Fig. 6: Six months postoperative



Fig. 7: Six months postoperative

cement and the coronal restoration was done with resin composite (3M Dental Products, Saint Paul, MN, USA). Immediate postoperative radiograph showed dense obturation in the resorptive defect. Follow-up done at an interval of 6 months and 1 year showed asymptomatic and functional tooth (11). Radiographic examination revealed no further signs of resorption with intact dense obturation (Fig. 6).

DISCUSSION

The prognosis of the treatment for tooth resorption depends on various factors, such as the type of lesion, size, and its location.³ As it is asymptomatic, it is detected coincidentally through routine radiographs. Bacteria, bacterial by-products, and tissue breakdown products from within the root canal system stimulate inflammation in the adjacent periodontal tissues and lead to aggressive and progressive inflammatory resorption of the root.⁵ In the present case, the patient started noticing the discoloration of the concerned tooth toward the completion of fixed orthodontic therapy at the age of 20 years at which stage the root formation is complete. The patient had undergone fixed orthodontic therapy for a period of 2 years. The excessive orthodontic force might have been a causative factor for internal resorption of the tooth. It might have also resulted in the external resorption of the involved tooth toward the end of the treatment period due to increased cementoclastic activity as evidenced by the shorter root length and its irregular outline.

The mode of treatment of resorption is dictated by its etiology. If resorption is caused by pulpal necrosis, nonsurgical pulp space therapy is preferred. Nonsurgical pulp space therapy with a calcium hydroxide dressing was recommended by Andreasen.⁶ The use of calcium hydroxide as an interappointment medication maximizes

the effect of disinfection procedures.⁷ Copious irrigation with 3% sodium hypochlorite followed by 17% EDTA and saline helps in achieving chemomechanical debridement.^{8,9} The apical one-third of the canal was obturated by cold lateral compaction technique in order to ensure a dense apical seal without voids. Due to varied root canal morphology, the gutta percha needs to be flowable to fill the resorptive defect. Hence, backfilling of the canal was done with thermoplasticized gutta percha.¹⁰ The discoloration of the tooth was managed by an all ceramic crown (Fig. 7).

CONCLUSION

The early diagnosis and therapy are very important in order to stop the resorption process. It is imperative to initiate endodontic treatment as soon as possible to arrest the progression of the resorptive process and to prevent further weakening of tooth structure. As resorption of the tooth is associated with a varied root canal morphology, obtaining a three-dimensional obturation of the canal space is a challenge for the clinician. In such cases using a combination of different obturation techniques can help the clinician to achieve the desired outcome, following which the discoloration of the tooth can be managed using the appropriate method.

REFERENCES

1. Sigurdsson, A.; Trope, M.; Chivian, N. The role of endodontics after dental traumatic injuries. In: Cohen, S.; Hargreaves, KM., editors. *Pathways of pulp*. 9th ed. St. Louis (MO): Mosby Elsevier; 2006. 635 p.
2. Andreasen, J.; Bakland, L. Pathologic tooth resorption. In: Ingle, J.; Bakland, L.; Baumgartner, J., editors. *Ingle's endodontics*. 6th ed. Canada: BC Decker; 2008. p. 1358-1382.
3. Ne RF, Witherspoon DE, Gutmann JL. Tooth resorption. *Quintessence Int* 1999 Jan;30(1):9-25.

4. Heithersay GS. Management of tooth resorption. *Aust Dent J* 2007 Mar;52(1 Suppl):S105-S121.
5. Bakland LK. Root resorption. *Dent Clin North Am* 1992 Apr;36(2):491-507.
6. Andreasen JO. External root resorption: Its implications in dental traumatology, pedodontics, periodontics, orthodontics and endodontics. *Int Endod J* 1985 Apr;18(2):109-118.
7. Saad AY. Calcium hydroxide in the treatment of external root resorption. *J Am Dent Assoc* 1989 May;118(5):579-581.
8. Hand RE, Smith ML, Harrison JW. Analysis of the effect of dilution on the necrotic tissue dissolution property of sodium hypochlorite. *J Endod* 1978 Feb;4(2):60-64.
9. Moorer WR, Wesselink PR. Factors promoting the tissue dissolving capability of sodium hypochlorite. *Int Endod J* 1982 Oct;15(4):187-196.
10. Wilson PR, Barnes IE. Treatment of internal root resorption with thermoplasticized gutta-percha. A case report. *Int Endod J* 1987 Mar;20(2):94-97.