

Resorption in the maxillary incisor with dens invaginatus

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ABSTRACT

The management of root resorption is a challenge to the endodontist. It occurs in cases with chronic pulpal inflammation or due to trauma. Internal resorption, a rare phenomenon, has been a quandary from the standpoints of both its diagnosis and treatment. It is mostly asymptomatic and discovered by chance on routine radiographic examination or by a classic sign, the "pink tooth." Early diagnosis, removal of the cause, proper treatment of the resorbed root are mandatory for successful treatment outcome. External tooth resorption usually follows trauma to the periodontal ligament. It is often confused with internal resorption. A combination of both external and internal resorptions can also occur on the same tooth, making the management more complex. Dens invaginatus is a developmental malformation of the teeth that most commonly affects the permanent maxillary lateral incisor. The clinical importance of dens invaginatus results from the risk of pulpal disease. The presence of dens invaginatus with internal resorption is extremely rare. This paper is an attempt to summarize the knowledge on internal root resorption and present cases, which were successfully managed by different treatment modalities.


Key words: Dens invaginatus, internal resorption, pulpal inflammation, trauma

INTRODUCTION

It is a surprising fact that a permanent tooth throughout life is placed in such an environment where it is surrounded by very active bone cells without being advanced upon by any of these two cell lines under normal conditions.^[1] The glossary of the American Association of Endodontists defines resorption as a condition associated with either a physiologic or a pathologic event resulting in loss of the dentin, cementum, or bone.^[2] Andreasen has categorized tooth resorption as internal, i.e. inflammatory and replacement, and external, i.e., surface, inflammatory, and replacement.^[3]

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Internal root resorption is a gradual destruction of the intraradicular dentin along the middle and apical thirds of the canal walls as a result of clastic activities.^[4] The etiological factors suggested for internal root resorption are traumatic injury, infection, and orthodontic treatment.^[5] External resorption begins in the periodontium and damages the external or lateral aspect of a tooth. It may occur as a single entity or as a combination of internal and external resorptions on the same tooth. External resorption is often confused with internal resorption.^[6]

Dens invaginatus is a developmental disorder resulting in an invagination of the enamel organ into the dental papilla prior to calcification of the dental tissues (Hu¹ Ismann 1997).^[7] It

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is detected only by chance on routine radiograph. Unusual clinical crown morphology may give a hint of its existence.^[8]

The case report presents the treatment prognosis of an upper lateral incisor tooth with dens invaginatus and internal and external resorption.

CASE REPORT

A 28-year-old female reported to the department of conservative dentistry and endodontics with a chief complaint of pain in the upper left front tooth region. There was a history of trauma in relation to 22, 3 years back, which was resolved on taking medication. Medical history was noncontributory. Intraoral inspection revealed a discolored crown, Ellis class II fracture involving the enamel and dentin in the mesioincisal angle of the teeth with deep cavity on the lingual surface of 22 [Figure 1].

22 was nonvital on pulp testing, whereas adjacent 21, 23 were vital. Tenderness to percussion was present in 22. Intraoral periapical radiograph revealed a type 1 dens invaginatus (Oehler's classification of dens invaginatus) with the presence of an oval-shaped radiolucency at the junction of the coronal and middle one-third of the pulpal canal in the root and the apical area showed diffuse periapical radiolucency extending upon the middle third of the lateral surface of the root on the distal aspect of the root with loss of lamina dura [Figure 2]. Cone beam computed tomography (CBCT) revealed a wide open apex with evidences of resorption on the distal and palatal aspects of the root [Figure 3] and complete loss of alveolar bone on the distal surface of 22 extending up to the apex of the root. Following clinical and radiological findings, the diagnosis was chronic apical periodontitis with type 1 dens invaginatus with internal and external resorptions. The treatment plan of endodontic therapy with obturation and walking bleach was planned followed by partial direct composite veneer. Endodontic access preparation was made and the canal orifice was located. Root canal length was determined with K file ISO no. 25 (Mani, Japan) and the canal was prepared using step-back technique with apical preparation till ISO no.

60 (Mani, Japan). Saline, 2.5% sodium hypochlorite solution, was used to irrigate the canal during the canal preparation. Master cone (DENTSPLY) was selected using customized GP roll cone method. The fit of the master cone was assessed radiographically. Final irrigation was made with sodium hypochlorite and the root canal was dried with paper points. Root canal with internal resorptive area was obturated using warm lateral condensation using heated spreaders [Figure 4a]. After obturation with glass ionomer (type 9 restorative) restoration was done and recalled for review. The patient was asymptomatic and the radiograph revealed successful healing of the lesion in 22 [Figure 4b]. Since the tooth was discolored, it was decided to bleach (POLA OFFICE) the tooth followed by direct composite veneer (PRIME DENT USA) [Figure 5].

DISCUSSION

There is always a dilemma of whether to treat a tooth with a questionable prognosis endodontically or extract it and subsequently place an implant. In this case report, we observed an internal resorption area at the junction of coronal and middle third of the root and the lateral aspect of the external root surface. Although the etiology of the mechanism of resorption has not been exactly known, it is believed to be very similar to the mechanism of bone resorption. The progress of an internal resorption is dependent on two things: the presence of vital pulp tissue at/below the resorption area and partially or completely necrotic pulp coronal to the site of resorption.^[9] Treatment of inflammatory resorption is based on removal or reduction of the source of infection.

In the literature, there is limited information about the cases with dens invaginatus causing internal resorption, and it is emphasized to be rarely encountered but in these case type 1 dens invaginatus was seen, which did not contribute to cause.^[10] Bleaching of discolored nonvital teeth was first



Figure 1: Preoperative photograph reveals (a) discolored crown (b) deep small cavity



Figure 2: Radiograph reveals dens invaginatus with internal resorption and periapical pathosis relation to 22

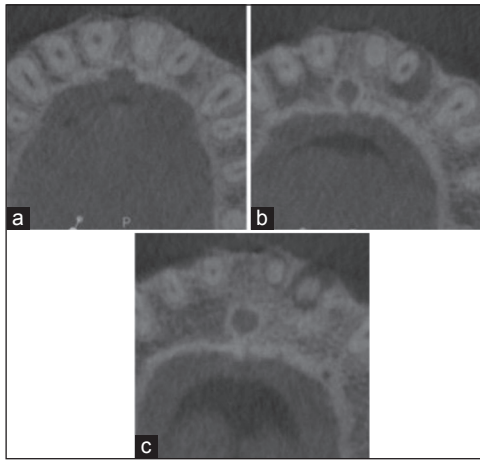


Figure 3: Axial view showing resorption at (a) cervical (b) middle (c) apical

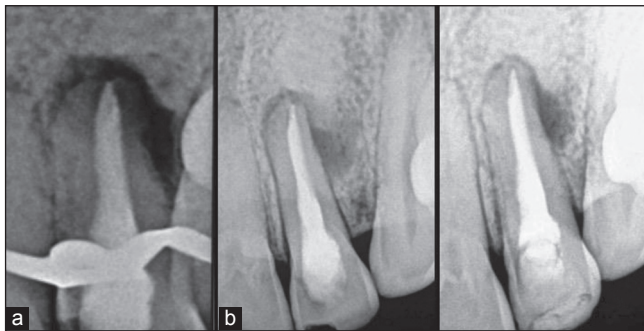


Figure 4: (a) Obturation (b) Postoperative (3-month and 6-month follow-up radiographs)



Figure 5: (a) Tooth preparation (b) etching (c) bonding (d) finishing and polishing (e) composite restoration

reported during the middle of the 19th century.^[11] Given the appropriate indication, the bleaching of nonvital

teeth is a relatively low-risk intervention to improve the aesthetics of endodontically treated teeth.^[12] Depending on the situation, the walking bleach technique can be an uncomplicated and convenient method for both patients and dentists.

Veneer is a layer of tooth-colored material that is applied to a tooth to restore localized or generalized defect and intrinsic discoloration. The common indication for direct veneer includes tooth malformation, discolored tooth, and abraded or eroded teeth fracture teeth.^[13] This case presented with Ellis class II fracture involving mesioincisal angle and as the rest of the tooth was intact, direct partial veneer was indicated instead of a full coverage crown, which could compromise the tooth structure.

Despite the serious damage to the root by external root resorption, nonsurgical root canal therapy arrested the external root resorption and the radiograph showed a successful periapical healing of tissue after 3-month and 6-month follow-ups.

CONCLUSION

Apart from clinical examination and periapical radiographs, CBCT is an important useful tool in the diagnosis of resorption. 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.

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Conflicts of interest

There are no conflicts of interest.

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