



CASE STUDY

MULTIDISCIPLINARY MANAGEMENT OF A RARE CASE OF IATROGENIC ROOT PERFORATION WITH GINGIVAL DEFECT IN ESTHETIC ZONE

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ABSTRACT

A rare case of iatrogenic root perforation with corresponding gingival defect in esthetic zone was reported by 21 year old boy. Cervical root perforation of a maxillary left central incisor was associated with the defect in the attached gingiva with the history of incomplete root canal treatment. The tooth was retreated, perforation was sealed and gingival defect was corrected improving the esthetics of a patient. A multidisciplinary management to seal off the unusual iatrogenic root perforation by using resin ionomer cement successfully by a restorative dentist, negotiating & obturating a root canal skillfully by an endodontist, management of a gingival defect by periodontist was undertaken to achieve the promising results. Collaborative effort by these specialties significantly enhanced the esthetics of a patient.

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INTRODUCTION

Although root perforations are not common, they pose a serious problem that considerably affects the prognosis of endodontic treatment. (Fuss and Trope, 1996) Perforation of root canal walls may be caused by endodontic procedural accidents, caries, or resorptive processes. Root perforation may also cause defects with varying degrees of periodontal tissue damage. (Mandel *et al.*, 1993; Ingle, 1985; Alhadainy, 1994) Repair of endodontic perforation depends upon the location and size of the perforation. (Duggins *et al.*, 1994; Seltzer *et al.*, 1970) It may be achieved either through a conservative, non-surgical technique or by employing surgical intervention. The sole aim is to seal the defect to prevent the exodus of noxious elements from within the tooth that can further irritate the associated periodontal tissues. (Delivanis and Goerig, 1981) The location of the perforation along the root also greatly affects the overall prognosis of the tooth. (Alhadainy, 1994; Duggins *et al.*, 1994; Seltzer *et al.*, 1970) The treatment plan for perforation repair depends on the visibility and accessibility of the perforation, size of perforation, associated periodontal condition, and strategic importance of the tooth. (Alhadainy, 1994) The goal is to seal the defect with a biocompatible material and maintain an intact periodontal attachment apparatus. (Duggins *et al.*, 1994) Surgical repair of endodontic perforations are usually

undertaken for defects that cannot be treated by other modalities. (Fuss and Trope, 1996; Alhadainy, 1994) It is also employed when a conservative repair has failed, or management of an associated periodontal defect is indicated. (Fuss and Trope, 1996) Various restorative materials such as amalgam, gold, ceramics, composite resins and glass ionomers have been used to restore such defects with limited success. Recently, resin-ionomers have been successfully used for filling subgingival defects caused due to external root resorption, root fractures, and root perforations of anterior teeth. (Fuss *et al.*, 2000; Drago, 1997; Scherer and Drago, 1995) Resin-ionomer (Geristore, Den-Mat Corp, Santa Maria, CA) is a small particle, hydrophilic, nonaqueous resin combined with a photoinitiator and glass powder formulation. They are insoluble in oral fluids, have good adhesion, high strength, and dual cure capability. Present case report demonstrates a multidisciplinary approach of a restorative dentist repairing a root perforation by using resin-ionomer, negotiating a blocked root canal and obturating it skillfully by an endodontist and a periodontist taking care of soft tissue defect over the perforated root.

Case Report

A 21 year old boy reported to the department of Conservative Dentistry & Endodontics complaining of pain in connection with maxillary left central incisor. A detailed case history revealed that the patient had an accident at the age of 10 years

and a general dentist then had performed a root canal treatment on that tooth. The clinical examination revealed a discolored maxillary left central incisor with a gingival cleft extending almost to the level of middle third of the root (Fig.1). A draining sinus was visible at its periapical area. On percussion the tooth was tender. Vitality tests confirmed that the maxillary left central incisor was non-vital. No mobility was observed. On radiographic examination, the root of maxillary left central incisor appeared stunted and resorbed apically. The root canal was incompletely obturated with gutta-percha. The provisional diagnosis was made as "failure of root canal treatment due to incomplete obturation with gingival defect". The gutta-percha was removed completely from the root canal. When #15 K-file was introduced, it emerged through the gingival defect labially as shown in figure 1. All attempts to negotiate the root canal with #15 K-file till root apex failed although radiographically no calcific barrier was observed. As there was a presence of periapical pathology with the sinus and a root perforation at the cervical level with no access to the remaining part of the root canal, it was decided to undertake the endodontic surgery in collaboration with a restorative dentist to take care of perforated root and a periodontist managing the soft tissue defect. After obtaining the permission from the ethics society of the University for the endodontic Surgery, patient's consent was obtained. Under local anaesthesia, a full thickness flap was raised to expose the root apex of maxillary left central incisor. Debridement of periapical pathology at the apex of maxillary left central incisor was carried out. No. 20 reamer was introduced and straight line access to the root apex was tried but to no avail, as there was a blockade at the apical end of the defect. The canal was enlarged to eliminate blockage to get access till the apex (Fig.2). Bio-mechanical preparation was completed; canal was dried, and obturated with laterally condensed gutta-percha. Apicectomy and retrograde filling with MTA was also completed. The root defect was repaired with the resin bonded glass ionomer. Flap was debrided, defect margins trimmed and sutured with 4-0 black braided silk. Periodontal dressing was given to protect the surgical wound. Patient was recalled after 10 days. Sutures were removed. Healing was satisfactory. Patient was again evaluated after a month. There was a complete coverage of root perforation with the gingiva showing excellent tissue response to the resin inomer at the end of four weeks. (Fig.3)



Figure 1. Discolored maxillary left central incisor showing gingival defect and the fistula in the vestibule. #15 K-file emerging through the labial root perforation and gingival defect

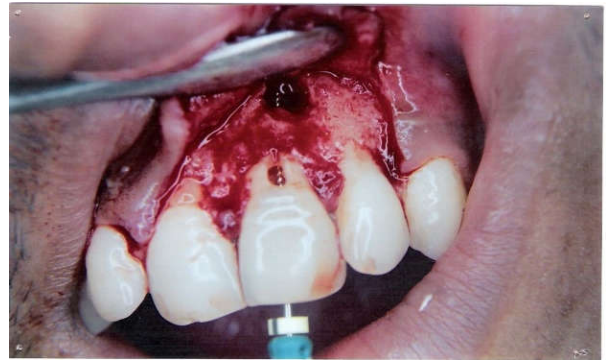


Figure 2. #30 K-reamer visible at the apex during endodontic surgery



Figure 3. Postoperative healing four weeks after surgery

DISCUSSION

An interdisciplinary approach to treat the rare case of iatrogenic root perforation with a gingival cleft is presented. The general dentist's inability to negotiate the root canal had resulted in perforation of labial surface of the root of maxillary left central incisor leading to loss of periodontal attachment with gingival cleft thereafter. Periapical lesion with sinus tract was observed due to the inadequately obturated infected root canal. Successful negotiation of the root canal till the apical foramen, its obturation and placement of a subgingival resin-ionomer restoration to repair root perforation are not the only important aspects of the treatment, periodontal repair to regain gingival health at the surgical site is equally important to demonstrate clinical success. (Alhadainy, 1994; Duggins *et al.*, 1994) The present case report is an excellent example of multidisciplinary approach to the management of iatrogenic root perforations by the endodontist, restorative dentist along with a periodontist. Endodontist negotiated and obturated the root canal successfully, endodontic surgery was performed to eliminate periapical pathology, and a restorative dentist and periodontist repaired the root perforation and corrected the soft tissue defect overlying the root perforation respectively. Collaborative effort by these dental specialties made significant improvement of patient's aesthetics.

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