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Management of Furcation Perforation: A Case Report

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ABSTRACT

Perforations are iatrogenic or pathological communications between the root canal system and the external tooth surface. These perforations significantly impact the success of root canal therapy, regardless of their iatrogenic or pathological origin. This case report describes the management of a furcation perforation in a 49-year-old female patient. The perforation was sealed with Mineral Trioxide Aggregate (MTA) and subsequent restoration was completed in a single visit.

INTRODUCTION

Perforations are defined as mechanical or pathological communication between the root canal system and the external tooth surface(1). This is followed by damage to periodontium, bone resorption, granulomatous tissue formation, and the development of periodontal defects(2,3). According to research, the incidence of perforations ranges from 0.7% to 10%.(4,5). Perforation can occur in the coronal, middle, and apical portion of the root as well as the furcation region(6). Furcation perforations are common in multirooted teeth while searching for canal orifices(7). The prognosis of perforation repair depends on factors such as the size of the perforation, location of perforation, and time of repair. Large perforation, perforations present in the cervical region of the tooth and delayed perforation repair are associated with poor prognosis(8). Furcal perforations can be repaired from materials such as amalgam, composites, Super EBA, Intermediate Restorative Material (IRM), Cavit, and glass ionomer however these materials lack biocompatibility and sealing ability(9). Mineral trioxide aggregate (MTA) is commonly used for the treatment of root perforations. MTA has a good sealing ability, induces cement genesis, and osteogenesis, and is highly biocompatible(10,11). This case report describes the management of furcal perforation with MTA.

CASE REPORT

A 49-year-old female patient presented to the Department of Conservative Dentistry and Endodontics with the chief complaint of pain and discomfort in her lower right back tooth for the past two weeks. Patient complained of mild intermittent pain in 46.

On clinical examination the tooth showed negative response to pulp sensibility tests and was tender on percussion. The tooth was not associated with any intraoral swelling and was of normal mobility. On radiographic examination deep proximal caries involving enamel, dentine and pulp. Periapical radiolucency involving mesial root and furcation was also observed (Figure 1).

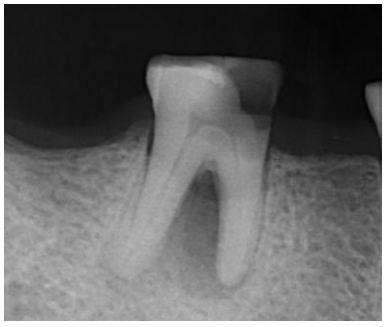

Figure 1: Preoperative radiographic image of tooth 46.

A diagnosis of pulp necrosis with chronic apical abscess was made. Nonsurgical root canal treatment was planned. Local anesthesia was administered and rubberdam isolation was done. After access opening, working length was determined (Figure 2) and Cleaning and shaping were done using the Crown down techniques, canals were irrigated in between the procedure with 3 percent Sodium Hypochlorite (Chemident, India) and normal saline, calcium hydroxide medicament was placed and temporary restoration was given.

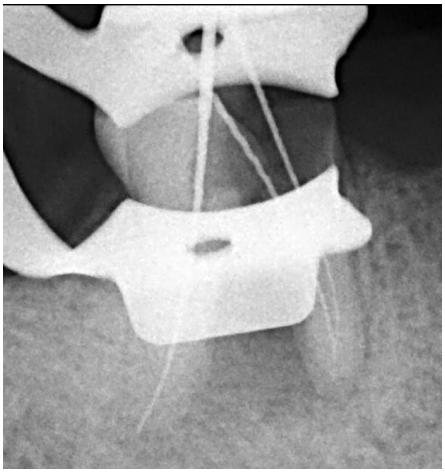

Figure 2: working length radiograph

The patient was recalled 7 days later. Canals were obturated using gutta-percha cones. The perforation site was cleaned with 2.5% sodium hypochlorite, bleeding was controlled with a collagen plug (Colo plug, cologenesis) (Figures 3 & 4).

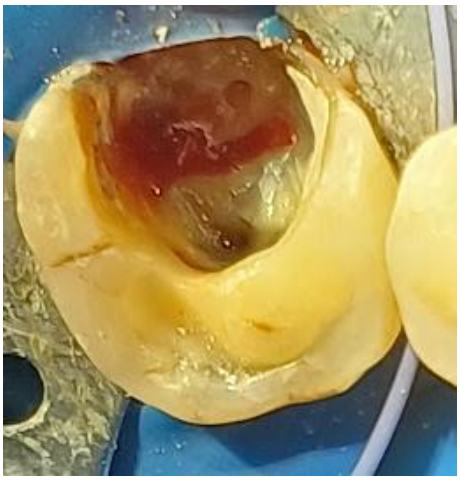

Figure 3: Bleeding at perforation site.

Figure 4: Haemostasis achieved with a collagen sponge. Figure 4) MTA placed at the perforation site

MTA (Mineral Trioxide Aggregate) was placed in the perforation site with help of the MTA carrier (Figure 5). Resin-modified glass ionomer glass-ionomer-liner was placed over MTA followed by composite restoration. On the recall visit after 1 week, the patient was asymptomatic. After 6 months healing was observed (Figure 6).

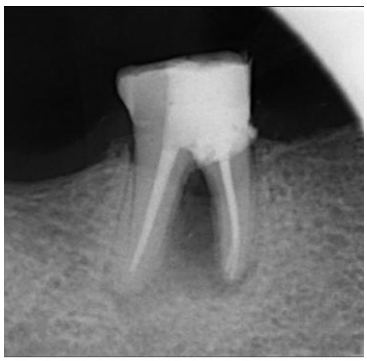

Figure 5: Post-operative radiograph

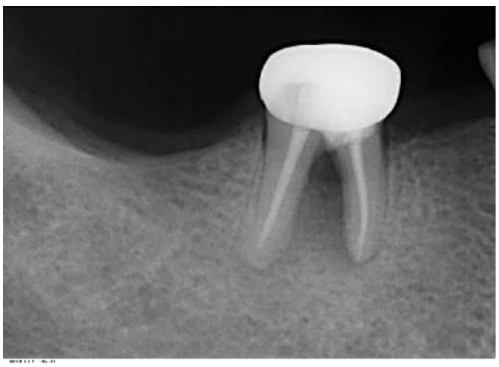

Figure 6: 6 months follow-up radiograph

DISCUSSION

The goal of perforation management is to preserve the health of the periodontal tissues next to the perforation while preventing loss of periodontal attachment or chronic inflammation(6). Therefore, the ability to seal the perforation and restore a healthy periodontal ligament is essential for effective healing(12). Root perforations have been repaired using a variety of materials. Historically, amalgam, calcium hydroxide, zinc oxide eugenol cement, gutta-percha, glass ionomer cement, composite resin, IRM (Dentsply Sirona), and Super EBA (Keystone Industries) have been the most widely used repair materials. However, none offered a favorable environment for restoring the normal tissue architecture, favourable healing following treatment (13,14). However, research has demonstrated that MTA's favourable characteristics, such as its greater marginal adaption and decreased bacterial leakage, make it a valuable material for repairing root and furcal perforations. According to Main et al., MTA effectively seals root perforations and may improve the prognosis of teeth(15). In the present case MTA was used for sealing perforation. one of the primary treatment objectives in performation management is the control of inflammatory processes in the ares of defect. In the present study disinfection of the perforation site was done with 2.5% sodium hypochlorite to improve tissue responsiveness(16). Another important factor influencing the outcome of the healing process is the size of the perforation; some authors recommend using an internal matrix to prevent the extrusion of the sealing material and thus subsequent irritation of the periradicular tissue(17–19). In the present study, perforation size was >2mm therefore collagen was used for achieving hemostasis and serving as an internal matrix. It is recommended to place the final restoration anywhere from one day to one week following the repair process(7). Whereas others suggest that composite resin with a bonding agent can be placed over MTA during a single visit(20). In the present study, composite resin restoration was placed over MTA in a single visit as immediate adhesive restoration has less probability of coronal leakage and strengthens the tooth(21,22). Healing was observed after 6 months indicating favourable outcome.

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