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Original Research Paper

Dental Science

NON-SURGICAL MANAGEMENT OF FLOOR PERFORATION OF MAXILLARY FIRST MOLAR USING MTA: A CASE REPORT

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ABSTRACT In endodontic practice one of the most common iatrogenic errors is furcation perforation. The purpose of treating furcal perforation is to seal the artificial communication between the endodontic space and the periradicular tissue to prevent alveolar bone resorption and damage to the periodontal ligament. Endodontic repair material should seal the pathways of communication between the root canal system and its surrounding tissues. In addition, it should be nontoxic, noncarcinogenic, nongenotoxic, biocompatible, insoluble in tissue fluids, and dimensionally stable. Because existing materials did not have these "ideal" characteristics, mineral trioxide aggregate (MTA) was developed and recommended for pulp capping, pulpotomy, apical barrier formation in teeth with necrotic pulps and open apex, repair of root perforations, root-end filling, and root canal filling.

KEYWORDS : furcal perforation, MTA, repair

INTRODUCTION

In endodontic practice procedural accidents are encountered that will affect the prognosis of the root canal treatment. One of these procedural accidents is endodontic perforation. Perforation is defined by the American Association of Endodontics (AAE) as a mechanical or pathological communication between the root canal system and the external tooth surface, which is caused by caries, resorption, or iatrogenic factors.

A successful treatment outcome of teeth with repaired perforations relies on numerous factors such as perforation size and location, time of occurrence, duration of exposure to the oral environment, and the repair material used.[1] Such defects have been repaired both surgically and non-surgically using different materials such as zinc oxide eugenol, Cavit, calcium hydroxide, glass ionomer cement, amalgam, gutta percha, tricalcium phosphate, hydroxyapatite, cold ceramic, Biodentine and Mineral Trioxide Aggregate (MTA). This present case report illustrates the use of MTA for the repair of the endodontic perforation defect.

Case Study

A 16-year-old systemically healthy male patient reported to department of conservative dentistry and endodontics with the chief complaint of continuous dull pain in left upper back region of the jaw for more than 2 weeks. Past dental history revealed that the patient had undergone root canal treatment by a general dental practitioner 2 weeks ago. Clinical examination showed access cavity preparation with bleeding from the floor of pulp and the tooth is tender on percussion wrt 26 (figure A). The perforation site was radiographically identified with the help of a 10k file (figure B). Endodontic treatment was initiated under rubber-dam isolation. After biomechanical preparation of the root canals were prepared upto size F 2 ProTaper files system (Dentsply, Konstanz, Germany).

The canals were copiously irrigated using normal saline (Denis chem, india) and 2% chlorhexidine (Neelkanth chlorhexidine gluconate solution, India). Sodium hypochlorite was avoided as it could percolate through the perforation into the periodontium. Canals were closed by a GP cone (Dia-ProT, Diadent group international, Korea) so that there will be better visibility for the perforation to be repaired and the repair materials doesn't block the root canals.

The perforation area was cleared, bleeding was controlled by applying pressure with sterile cotton pellets and using sterile haemocoagulase solution (botroclot topical solution, India) and MTA (Angelus; Brazil) was used to repair it. The powder MTA was mixed with distilled water in a dappen dish and was placed into the perforation area by the help of MTA carrier. The perforation was repaired; using MTA to form a complete layer on the floor of the pulp chamber and distal wall of the tooth was also restored with the help of composite (figure C, D). Non-setting calcium hydroxide was used as an intra-canal medicament and pulp chamber was sealed with Cavit (Prevest denpro, india) for 1 week. On the subsequent visit after 7 days, the tooth was asymptomatic but there was a dislodged composite restoration wrt 26. The root canals were obturated with gutta percha by lateral condensation technique (figure E). On next visit of the patient (after 1 week), a post space was prepared in the palatal root canal with the help of Gates-Glidden drills and peeso reamers upto a no.3 size. A no.3 long metal post was luted with luting GIC (Vivaglass CEM PL, Ivoclar, India) in the palatal canal (figure F), tooth was then restored with composite restoration followed by crown preparation and PFM crown (figure G and H). Patient was recalled after 3 months and was asymptomatic when he last reported.

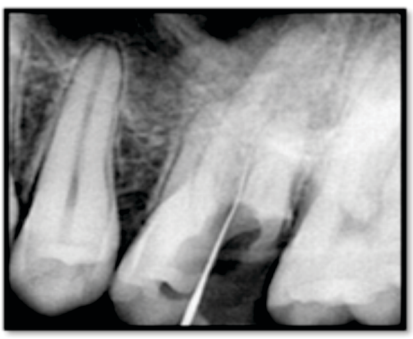

Figure A

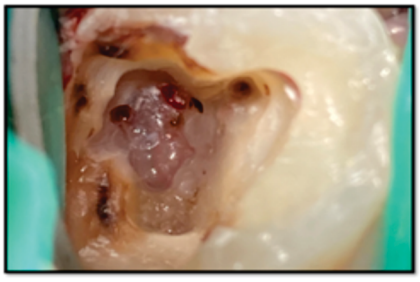

Figure B

Figure C

Figure D

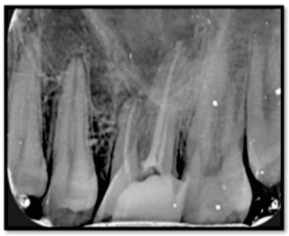

Figure E

Figure F

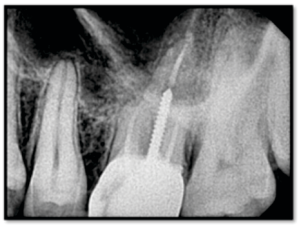

Figure G

Figure H

DISCUSSION

Out of the various factors affecting the prognosis of teeth with iatrogenic perforations, timely intervention, size and the level of perforation (relative to crestal bone and epithelial attachment) are probably the most important. A perforation occurring relatively close to the crestal bone, and the epithelial attachment is critical as it may lead to bacterial contamination from the oral environment along the gingival sulcus. Furthermore, apical migration of the epithelium to the perforation site can be expected, creating a periodontal defect. Such lesions which present with both endodontic and periodontal involvement are known as endo-perio lesions.

The etiology of root perforations can be pathological, i.e., secondary to resorption or caries, or iatrogenic that occurs during root canal treatment. An average 2%–12% of endodontically treated cases have reported accidental root perforations.[2] Perforations may also occur during access cavity preparation, postspace preparation or because of pathological internal resorption extending into the periradicular tissues.

Newer materials such as MTA, biodentine, dentin chips, bioceramics, calcium enriched material, with and without the use of barrier could be used to seal the perforation. Superior properties of MTA such as lesser bacterial leakage, biocompatibility, and better adaptation to cavity walls makes it a useful material in sealing the root and furcal perforation and of the two commercially available MTA angelus and ProRoot MTA, MTA Angelus has shorter setting time compared to MTA pro-root according to manufactures.[4]

Sluyk, Moon and Hartwell [5] assessed the effect of time and moisture on setting, retention, and adaptability of MTA when used for furcal perforation repair. Findings showed that MTA adaptation to perforation walls increased in the presence of moisture. They further suggested that a moistened matrix can be used under MTA to prevent under- or overfilling of the material. Furthermore, Main et al [6] also successfully used MTA to repair various kinds of perforation. Thus, MTA is considered the gold standard and material of choice for perforation repair and has demonstrated good potential for clinical success.

REFERENCES:

1. Pace R, Giuliani V, Pagavino G. Mineral trioxide aggregate as repair material for furcal perforation: Case series. J Endod. 2008;34:1130-1133.
2. Sinai IH, Romea DJ, Glassman G, Morse DR, Fantasia J, Furst ML, et al. An evaluation of tricalcium phosphate as a treatment for endodontic perforations. J Endod 1989;15:399-403.
3. Tanomaru Filho M, Tanomaru JM, Faleiros FC. Capacities machining and adaptation of materials used in furcation perforations. Rev Fac Odontol Lins 2004;16:19-24.
4. Narasimhan D, Hedge P, Hedge NM. Comparative evaluation of the efficacy of three different dental materials in sealing perforation an in vitro study. Indian J Appl Res 2015;5:135.
5. Sluyk SR, Moon PC, Hartwell GR. Evaluation of setting properties and retention characteristics of mineral trioxide aggregate when used as a furcation perforation repair material. J Endod. 1998;24:768-771.
6. Main C, Mirzayan N, Shabahang S, et al. Repair of root perforations using mineral trioxide aggregate: a long-term study. J Endod. 2004;30:80–83.