

Furcation perforation repair: A case report

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Abstract

Furcation perforation is an iatrogenic communication that is formed between the tooth and supporting tissues. It is important to manage perforations as soon as they are diagnosed. An ideal perforation material has to be selected for successful treatment. This case report presents successful management of a case of iatrogenic furcation perforation, treated and sealed with Mineral Trioxide Aggregate.

Key Words: Furcation perforation, Iatrogenic perforation, non-surgical management, Mineral Trioxide Aggregate, consequences of perforation, Perforation repair materials

INTRODUCTION

Perforations are the artificial communications that are formed iatrogenically or pathologically between the tooth and supporting tissues. These perforations can drastically effect the long term prognosis of the root canal therapy. Resorption and caries forms pathological communication while the iatrogenic communications are formed during root canal treatment.¹ The major complication of a perforation is the secondary infection of periodontal tissues and tooth loss. Procasinating the perforation repair can lead to an unfavorable prognosis. Perforations are classified into coronal perforations, furcation perforations, post space perforations, root canal perforations based on the location. Furcation perforation is an iatrogenic perforation of the furcation area in multi-rooted molars during preparation of the access cavity.

Iatrogenic perforations occurs as a result of inappropriate use of endodontic instruments, atypical tooth position in the arch, lack of knowledge in dental anatomy, calcified pulp chamber, endodontic procedure through prosthetic crowns.² The significant considerations in a successful perforation management include, repair time, level and location, size, access and visibility of the perforation, periodontal status of the tooth, and biocompatibility of perforation repair material.³ A definitive diagnosis of a perforation based on symptoms and radiographic findings can enhance the chances of a perforation repair procedure to be effective.

CASE REPORT - 1

A 19-year-old female patient presented to the TMDCRC's 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. Food lodgement on the same tooth aggravated the pain. On

clinical examination, a carious lesion involving enamel, dentin, and pulp was discovered. An intraoral periapical radiograph revealed a well defined radiolucency involving enamel, dentin and pulp suggestive of deep dental caries. Periapical radiolucency suggestive of apical periodontitis. The treatment plan was non surgical root canal treatment. Access cavity preparation was done on the same appointment and temporary restoration was given. Patient was given appointment after 5 days for biomechanical preparation. Patient reported back to the department complaining of severe pain associated with the tooth on which root canal treatment was initiated. Patient experienced continuous and severe pain after the effect of local anesthesia was diminished. Temporary restoration that was placed on the previous appointment was removed. It was noted that access cavity filled with blood without any provocation. Furcation perforation was confirmed with a radiograph.



Furcation perforation was confirmed with the help of a radiograph

Bleeding was arrested with the help of a cotton pellet. Treatment was initiated after the administration of local

anesthesia. Root canals of 46 were negotiated fully and working length was determined. Cleaning and shaping were performed using the Crown down method, and irrigation was performed with diluted 3 percent Sodium Hypochlorite and normal saline. Care was taken not to extrude Sodium hypochlorite into the periodontal tissues. Root canal preparation was done till Protaper Gold F1 for mesiobuccal, mesiolingual canals and F2 for distal canal. The canals were obturated using single cone technique. Mineral Trioxide Aggregate was selected as the material of choice for perforation repair. Mineral Trioxide aggregate was manipulated on a glass slab. MTA was carried to the perforation site with the help of an MTA carrier. MTA was placed above the furcation perforation. MTA was dampened and condensed with the help of a cotton pellet. Glass ionomer restoration was placed over it. Antibiotics and analgesics were prescribed to the patient. Pain subsided after the procedure and the patient as asymptomatic from the next day. Patient was recalled after 30 days for follow up.

sealed to prevent the entry of noxious elements from within the tooth that will cause complications.⁵

A wide variety of perforation repair materials are described in the literature, that include Indium foil, Amalgam, Plaster of Paris, Zinc Oxide Eugenol, Super EBA, IRM (Intermediate Restorative Material), Gutta Percha, Cavit Glass Ionomer Cement, Composite, Dentin chips, Decalcified Freezed Dried Bone, Calcium

Phosphate Cement, Tricalcium Phosphate Cement, Hydroxyapatite, Calcium hydroxide Portland Cement, Mineral Trioxide Aggregate, Biodentine, Bioaggregate



Perforation repair was done with MTA

Endosequence, Calcium enriched mixture etc. Many of these materials are not used now because their disadvantages outweigh their benefits.

Mineral Trioxide aggregate showed good treatment outcomes owing to its biocompatibility and low tissue toxicity. MTA can provide an adequate seal in the presence of moisture and blood which is the most significant advantage when it is used as a furcation repair material. MTA has an alkaline pH of 12.5 and aids in periodontal ligament regeneration and cementogenesis.⁶

This case of furcation perforation was managed with MTA. The desirable properties of MTA, as well as the material's availability, lead to its use. Since there was contact with the underlying periodontium and contamination from blood and moisture, a material had to be selected which could set in the presence of moisture.⁷ Pertaining all of these properties, MTA is the most often used perforation repair material.

CONCLUSION

All in all, a perforation is an unfortunate mishap during treatment that can happen to the best of us. Regardless of the approach, surgical or non surgical; there are certain factors that can significantly affect the success of repair. The clinician should have proper knowledge of tooth morphology, sound clinical judgement and adequate operative skills so as to avoid ending up with a perforation in the first place.

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Mineral Trioxide Aggregate

Dispensing of MTA

Mixing of MTA to putty like consistency

MTA has been carried to the site with the help of an MTA carrier

DISCUSSION

Perforation acts as an open channel for bacteria to enter, either from the root canal or periodontal tissues, or both, eliciting an inflammatory response that can lead to fistulae and bone resorptive processes.⁴ When a perforation occurs laterally or in the furcation area, gingival epithelium may overgrow towards the perforation site, worsening the tooth's prognosis. Depending on the size and location of the perforation, repair can be accomplished using either a conservative, non-surgical technique or surgical intervention. All perforations must be

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