

Perforation repair using biodentine: A nobel approachMukherjee M¹, Shekhawat K²¹Dr Mridusmita Mukherjee
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Dr Mridusmita Mukherjee
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9707642977, 8011653058**ABSTRACT**

Root perforations are one of the many consequences of compromised endodontic procedure. It not only poses a significant problem in treatment outcome but also greatly affects the prognosis if not repaired in time. If it occurs, it allows microbial invasion and inflammation in the non-invaded area of operation. So, choice of restorative material should be such that it closes the pathway of communication between the root canal system and its associated tissues. It should possess all the good qualities of an ideal orthograde or retrograde filling material. The following note describes a case report of a young male with failed root canal treatment performed earlier with its steps of management.

Key Words: Endodontics, perforation, inflammation

Introduction

Endodontic mishaps or procedural accidents are unfortunate occurrences that can occur during treatment. A well-done root canal procedure can be destroyed in a few seconds by a misdirected post space preparation or during endodontic treatment. Unfortunately perforations are the common cause of failure when endodontically treated teeth are restored. These failures are mainly due to improper restorative concept and poor clinical judgment. Accidental root perforations do occur in approximately 2–12% of endodontically treated teeth that might have serious implications^[1-6] Such perforation acts as an open channel encouraging bacterial entry either from root canal or periodontal tissues or both eliciting inflammatory response that results in fistulae. When perforation occurs laterally or in furcation area there might be over growth of gingival epithelium towards the perforation site worsening prognosis of the tooth^[7] So, perforations must be addressed depending on its size with appropriate choice of material and technique. Biodentine is a new tricalcium silicate (Ca₃SiO₅) based inorganic restorative commercial cement and advertised as “bioactive dentin substitute” and was introduced by Gilles and Olivier in 2010.^[8] It is composed of tricalcium silicate, dicalcium silicate, calcium carbonate,

zirconium oxide, iron oxide in powder form. The liquid contains calcium chloride and hydrosoluble polymer^[9]. It has a setting time of 9 to 12 min and the highest compressive strength due to the low water/cement ratio compared to the other tested materials. It also has increased resistance to erosion and microleakage than MTA, Dycal and GIC. It has high alkaline pH and is an excellent biocompatible material. All such properties makes it a favourable material for perforation repair^[10,11] Root perforations has been classified by Fuss & Trope as Coronal, Crestal and Apical perforation. Coronal perforation – coronal to the level of crestal bone and epithelial attachment with minimal damage to the supporting tissues and easy access. Crestal perforation – at the level of the epithelial attachment into the crestal bone. Apical perforation–apical to the crestal bone and the epithelial attachment. Out of them, apical perforation has good prognosis.

Case report

A 24-year-old male reported to the Department of Conservative Dentistry and Endodontics of Regional dental college, Guwahati with a chief complaint of pain in relation to lower left back region since 6 months. The patient briefed about root canal treatment performed earlier following

which pain and occasional pus discharge occurred. Prior to reporting to the institution, the patient managed the symptoms with over the counter prescription drugs. At the time of clinical presentation, there was extensively decayed left lower second molar. Intra-oral periapical radiograph revealed incomplete endodontic treatment with perforation at the furcation area. However, no evidence of periapical pathology was present in relation to the tooth. Based on the clinical findings, retreatment of tooth was advised and the patient agreed. Access was regained and perforation was sealed with biodentine (septodont). Following working length determination, cleaning and shaping with K type instruments and protaper next file system (Dentsply, Maillefer, Tulsa, USA) was done. Calcium hydroxide (Endocal, Septodont) was administered as an intracanal medicament. The access preparation was sealed with a cotton pellet and cavit. In the next appointment, master cone IOPA was done and canals were obturated. It was followed by placement of post endodontic restoration. Patient was recalled after few months and was found to be asymptomatic. So, it can be said that the material "biodentine" showed encouraging results.



Fig. 1 Preoperative IOPA



Fig. 2 After placement of biodentine

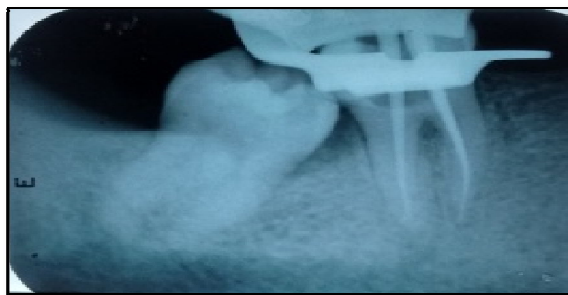


Fig. 3 Master cone IOPA

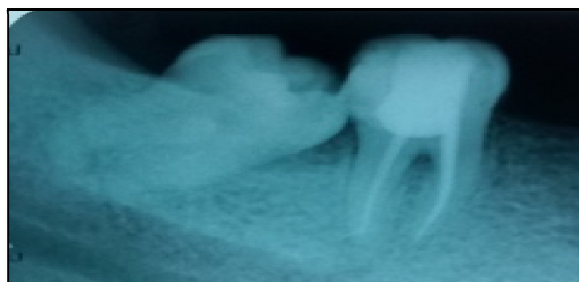


Fig. 4 Post obturation IOPA after 3 months

Discussion

Root perforations can occur pathologically as a result of resorption and caries or iatrogenically during root canal treatment.^[12] The root perforations can be identified by radiographs, direct observation of bleeding by an apex locator or a paper point.^[13] Perforations are also usually painful. Furcal perforation causes secondary inflammation of the periodontal attachment, which can lead to the loss of tooth if not treated. Treatment should seal the pathways of communication between the root canal system and its surrounding tissues. Filling material so should be biocompatible, nontoxic, noncarcinogenic, easily obtainable, convenient to use, inexpensive and promote the growth of cementum or allow for its replacement by new, healthy bone by acting as a barrier against which the root canal obturating material can be placed.^[14,15] However, prognosis depends on the contamination, size and location of perforation site^[16,17] In a study by Gunesser et al, Biodentine showed considerable performance as a perforation repair material even after being exposed to various endodontic irrigants as compared to MTA.^[18]

Conclusion

With new knowledge, technology and advancements in dentistry, specifically endodontics have vastly improved the quality of care rendered to patients, so we are able to keep many teeth that in the past would have been extracted and possibly replaced with an implant or a fixed or removal partial denture. So thorough idea regarding its restorability is essential which includes knowledge of site, size, time of perforation and choice of materials selected. Biodentin is a promising restorative material with less cost and better handling properties.

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