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Case Report

Endodontic management of a mandibular molar with self implanted foreign bodies and repair of furcural perforation using biodentin – A case report

Vivek Sharma[1,*], Sarang Sharma[1], Pooja Dudeja[1], Shibani Grover[1], Sukhwinder Singh Oberoi[2], Sweta Rastogi[1], Harshdeep Singh[3]

[1]*Dept. of Conservative Dentistry & Endodontics, ESIC Dental College & Hospital, Rohini, New Delhi, India*
[2]*Dept. of Public Health Dentistry, ESIC Dental College & Hospital, Rohini, Delhi, India*
[3]*ESIC Dental College & Hospital, Rohini, Delhi, India*

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ABSTRACT

Foreign Bodies, whether accidently trapped or self-introduced by the patient in the tooth can not only act as a potential source of infection but may also interfere with proper cleaning and shaping and subsequent obturation of the root canal space in such teeth. Such foreign bodies are generally found accidently on routine dental examination and are more common in children and anterior teeth. Though occurrence of foreign bodies in a root canal system is a fairly common finding, the present case was deemed even more complex as it had a furcural perforation in addition of the detection of foreign bodies in the root canal system.

This case report highlights the successful endodontic management and orthograde removal of self-introduced foreign bodies and repair of furcural perforation with biodentin in a mandibular molar eliminating the need of surgical repair and management.

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1. Introduction

The presence of foreign bodies is a fairly common occurrence especially in teeth with open pulp chambers either due to caries or trauma or loss of temporary restoration in incomplete root canal procedure cases. Incidence of foreign bodies in pulp chamber of a tooth is more common in children and anterior teeth than in adults and posterior teeth. These foreign bodies may either accidently get entrapped in the pulp chamber of the tooth upon loss of restoration or may even be a result of deliberate probing into the teeth by the patient in order to remove lodged food remnants.[1] Either way, such objects are a potential source of infection and may lead to a number of complications such as pain, swelling and recurrent abscess.

A variety of techniques and even a combination of them have been employed to retrieve any foreign body lodged in the root canal system.[2] Invariably, the techniques used are the same as those used for retrieval of fractured instruments from the canal space. These methods may include using H-Files using braiding method, Stieglitz forceps, ultra-sonic tips, instrument retrieval system or Masserann kit, modified Castroviejo needle holders, use of surgical operating microscope etc.[3–7]

If the foreign body is within the confines of the root canal system a non-surgical approach using such techniques may suffice. However, surgical intervention may be necessary if the foreign body extends beyond the root.[8]

Endodontic mishaps such as perforations may not only adversely affect the final prognosis but can also make the subsequent removal of the foreign material cumbersome. Hence, removing the foreign body and the sealing of

* *Corresponding author*.
E-mail address: docvky@gmail.com (V. Sharma).

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the perforation defect in toto is imperative for complete healing.[9]

Biodentine is a calcium-silicate based material that has drawn attention in recent years and has been advocated to be used in various clinical applications, such as root perforations, apexification, resorptions, retrograde fillings, pulp capping procedures, and dentine replacement.[10]

Presence of foreign objects in the root canal system is a bizarre yet common occurrence in dental practice which adversely affects the prognosis of the involved tooth. Cases of self-implantation of foreign bodies is very common in younger children (< 5years of age) but can occur in adults too. 65% of deaths in such cases has been involving infants younger than 1 year. The most common teeth to be involved are maxillary central incisors followed by maxillary and mandibular molars. Combination of conventional methods of history taking along with newer methods of radiographic examination coupled with the operator's patience and up to date knowledge of dental materials is paramount for treating similar cases with presence of foreign objects and procedural errors.

This case report illustrates the successful endodontic management and orthograde removal of self-introduced foreign bodies and repair of furcural perforation with Biodentine in a mandibular molar eliminating the need of surgical repair and management.

2. Case History

A 22-year-old male patient reported to the Department of Conservative Dentistry & Endodontics, ESIC Dental College & Hospital, New Delhi with the complain of mild pain in lower right back teeth region for 2 weeks especially after having food. The pain used to radiate to the ear and temporal region and was relieved either by taking analgesics and/or removing food that was lodged within the tooth. Clinical examination revealed an access cavity prepared in tooth # 46 with loss of temporary restoration and subsequent food lodgement. Radiographic examination revealed the presence of a radio-opaque object in the pulp chamber of tooth # 46 along with radiolucency involving the furcural region. (Figure 1) After careful assessment of the clinical and radiographic findings, retrieval of the foreign object and subsequent completion of endodontic therapy was planned.

Conventional access cavity preparation was prepared under rubber dam isolation. Irrigation was done using 5.25% sodium Hypochlorite (Parcan, Septodont) and normal saline solutions. After a series of attempts the foreign object was removed from the chamber using a Stieglitz forceps. Successful retrieval of the foreign object from the pulp chamber was confirmed by taking a radiograph. The object was a loop of a metal wire with sharp ends and measured approximately 11 mm in length. (Figure 2) Pulp was extirpated and at this point a perforation defect was noted in the furcural region.

Fig. 1: Pre-operative radiograph showing the presence of foreign body in the pulp chamber of tooth # 46.

Fig. 2: Metal wire(Foreign Object) retrieved from the pulp chamber.

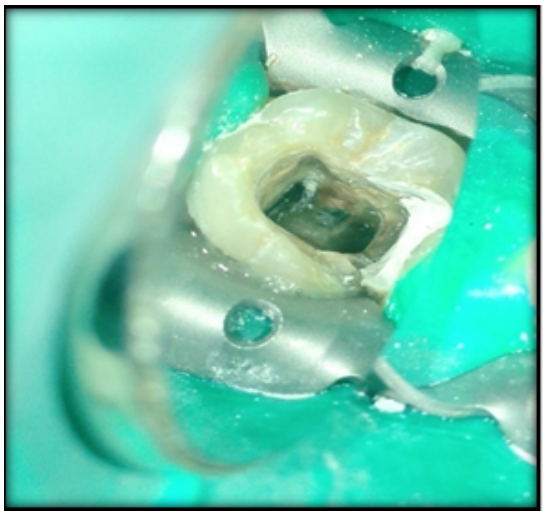

Fig. 3: Intra oral view of the chamber showing the presence of furcation defect at the floor of the pulp chamber of tooth # 46.

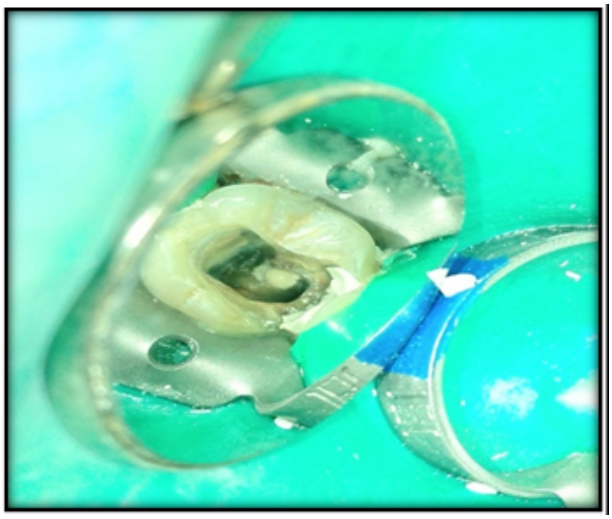

Fig. 4: Perforation repaired using Biodentin.

Fig. 5: Post-operative radiograph.

(Figure 3) The patient was informed about the guarded prognosis and the perforation defect was repaired and sealed with Biodentine under magnification from dental loupes at 3.5X magnification (Heine Dental Loupes, Heine Optotechnik, Germany) as per manufacturer's instructions (Septodont India Pvt. Ltd.) (Figure 4) The tooth was temporized and the patient recalled after one week.

In the subsequent visits, working length was determined using apex locator and biomechanical preparation was completed with NiTi hand files (Mani Inc. Japan). Finally, the root canal was irrigated with normal saline and 2 % chlorhexidine (Amdent) was used as a final rinse. An intra-canal medicament containing calcium hydroxide (Metapex) was administered for two weeks. After this two-week interval, the tooth remained asymptomatic and obturation was done with gutta-percha using lateral condensation technique. (Figure 5)

3. Discussion

Root canals can be blocked due to many reasons like calcific metamorphosis, separation of endodontic files, presence of root canal obturating materials. There is abundant scientific literature describing various foreign objects blocking the root canal system. Sometimes these foreign objects may be pushed into the root canal system by the patient himself. Such self-mutilation behaviour is commonly seen in patients who drop out before the completion of root canal treatment and also in patients suffering from psychological disorders.[11] Such patients have a tendency to probe into their teeth especially after the interim restoration is dislodged.

Objects lodged in the root canal system may either be detected during clinical/ radiographic examination or during the course of endodontic treatment. Metallic obstructions may be detected radiographically however, non-metallic objects may escape radiographic detection and be found accidentally during clinical examination or when any obstruction is felt while instrumenting the canal. The detection and removal of such foreign bodies is cumbersome at times and the prognosis doubtful. Radiographic aids such as cone beam computed tomography (CBCT), parallax views and non-radiographic aids such as Castroviejo forceps, Masserann kits, ultrasonics, increased magnification and surgical operating microscopes are useful in detecting such foreign bodies lodged in the tooth increasing the success rate to about 79%.[12–14]

Several perforation repair materials are available to the practitioners these days including Mineral Trioxide Aggregate (MTA) and Biodentine.

Biodentine is a calcium-silicate based material (based on active bio silicate technology) and has been indicated in various clinical applications, such as root perforations, apexification, resorptions, retrograde fillings, pulp capping procedures, and dentine replacement.[15] The material is actually formulated using the MTA-based cement technology and the improvement of some properties of these types of cements, such as physical qualities and handling. Biodentin was preferred over MTA as the repair material in this case because of shorter setting time (8-12 minutes), better handling characteristics, biocompatibility and good sealing properties compared to MTA. The high biocompatibility and smooth surface of Biodentine as compared to MTA provides favourable healing of the periodontal tissues.[15] A study has shown that Biodentine showed considerable performance as a perforation repair material even after being exposed to various endodontic irrigants as compared to MTA.[16]

4. Source of Funding

None.

5. Conflict of Interest

None.

References

1. Ajike SO. Methods for removing metal obstructions from the root canal. *J West Afr Coll Surg*. 1993;5(3):10–11.
2. Meidinger DL, Kabes BJ. Foreign object removal utilizing the cavi-endo ultrasonic instrument. *J Endod*. 1985;11(7):301–4. doi:0.1016/S0099-2399(85)80161-8.
3. Williams VD, Bjorndal AM. The Masserann technique for the removal of fractured posts in endodontically treated teeth. *J Prosthet Dent*. 1983;49(1):46–54. doi:10.1016/0022-3913(83)90236-6.
4. Fros UG, Berg JO. A method for the removal of broken endodontic instruments from root canals. *J Endod*. 1983;9(4):156–9. doi:10.1016/S0099-2399(83)80038-7.
5. Lumley PJ, Walmsley AD. The removal of foreign objects from root canals. *Dent Update*. 1990;17:420–3.
6. Roda RS, Gettleman BH. Nonsurgical retreatment. In: Cohen S, Hargreavas K, editors. Pathways of Pulp. 9th Edn. St. Louis, Missouri: Elsevier Mosby; 2006. p. 944–1010.
7. Srivastava N, Vineeta N. Foreign body in the periradicular area. *J Endod*. 2001;27(9):593–4. doi:10.1097/00004770-200109000-00010.
8. Costa F, Robiomy M, Toro C, Sembronio S, Politi M. Endoscopically assisted procedure for the removal of a foreign body from the maxillary sinus and contemporary endodontic surgical treatment of the tooth. *Head Face Med*. 2006;8:37. doi:10.1186/1746-160X-2-37.
9. Malkondu Ö, Kazandağ MK, Kazazoğlu E. A review on biodentine, a contemporary dentine replacement and repair material. *Biomed Res Int*. 2014;p. 160951. doi:10.1155/2014/160951.
10. Yadav R, Tikku A, Chandra A. Endodontic management of foreign body in the root canal - case series. *Int J Sci Res Publications*. 2015;5(1):1–3.
11. Nagai O, Tani N, Kayaba Y, Kodama S, Osada T. Ultrasonic removal of broken instruments in root canals. *Int Endod J*. 1986;19(6):298–304. doi:10.1111/j.1365-2591.1986.tb00493.x.
12. Patel S, Dawood A, Ford TP, Whaites E. The potential applications of cone beam computed tomography in the management of endodontic problems. *Int Endod J*. 2007;40(10):818–30. doi:10.1111/j.1365-2591.2007.01299.x.
13. Nagai O, Tani N, Kayaba Y, Kodama S, Osada T. Ultrasonic removal of broken instruments in root canals. *Int Endod J*. 1986;19(6):298–304. doi:10.1111/j.1365-2591.1986.tb00493.x.
14. Biodentin. Active Biosilicate Technology. Scientific File; 2010. Available from: www.septodont.fr/fichiers_upload/biodentinscientificfile.pdf.
15. Rossi AD, Silva L, Gatón-Hernández P, Sousa-Neto MD, Nelson-Filho P, Silva R, et al. Comparison of pulpal responses to pulpotomy and pulp capping with biodentine and mineral trioxide aggregate in dogs. *J Endod*. 2014;40(9):1362–9. doi:10.1016/j.joen.2014.02.006.
16. Adiga S, Ataide I, Fernandes M, Adiga S. Nonsurgical approach for strip perforation repair using mineral trioxide aggregate. *J Conserv Dent*. 2010;13(2):97–101. doi:10.4103/0972-0707.66721.

Author biography

Vivek Sharma, Associate Professor

Sarang Sharma, Professor

Pooja Dudeja, Professor

Shibani Grover, Dean & Director Professor

Sukhwinder Singh Oberoi, Associate Professor

Sweta Rastogi, Assistant Professor

Harshdeep Singh, Intern

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