Staple diet: a foreign body in a tooth

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Summary. The chance discovery of a foreign object embedded in a tooth is uncommon, and requires radiographic examination to determine the composition and location of the object. The authors describe the case of an 11-year-old boy who presented with a staple lodged in the root canal of the maxillary left permanent central incisor. This staple was localized using parallax techniques and successfully removed from the canal. The radiographic techniques of localization and possible methods of removal of foreign bodies are discussed.

Introduction

Children have a habit of placing foreign objects in the oral cavity. Fortunately, this is usually without consequence. However, occasionally, these objects may become lodged in the teeth. Such foreign objects may become a source of pain and infection, causing the patient to present to the dentist. It is essential that the dentist takes a thorough history and performs a detailed examination, including an appropriate radiographic examination. This examination is required to ascertain the size, position and likely composition of the object, and also to establish the degree of difficulty that may be experienced in attempting to remove it.

Case report

An 11-year-old boy was referred to the Department of Paediatric Dentistry, University Dental Hospital, Cardiff, UK, by his general dental practitioner regarding recurrent abscesses in both maxillary permanent central incisors.

On examination, the patient had a Class III malocclusion with cross-bite. The maxillary central incisors were discoloured and broken down. Radiographic examination showed that the apices of the incisors were closed and there were unerupted maxillary canines present. A joint paediatric/orthodontic appointment

Correspondence: Nicholas Drage, Department of Dental Radiology, University Dental Hospital, Heath Park, Cardiff CF14 4XW, UK. E-mail: nicholas.drage@cardiffandvale.wales.nhs.uk was arranged for the patient, but unfortunately, he failed to attend.

The patient represented 5 months later, complaining of an abscess associated with the maxillary left permanent incisor for which his dentist had prescribed amoxycillin. A periapical radiograph of the tooth showed a metallic foreign object 'in' the tooth. A further periapical radiograph was taken from a slightly different horizontal angle, and using parallax, it was confirmed that the metallic object was located within the root canal rather than in the periodontal ligament space (Fig. 1). On further questioning, the patient admitted to 'chewing staples' some months previously. The patient refused any treatment that day. On a subsequent visit, the patient attended with his father, who was positive and supportive in his attitude, and the patient was able to accept dental treatment. The pulp chamber was found to be open to the oral cavity, but occluded with food matter. An access cavity was prepared, and the staple removed from the canal using a barbed broach. Further debris, presumed to be food matter, was flushed out of the canal using isotonic saline solution (Fig. 2). The tooth was dressed with non-setting calcium hydroxide, and then a cotton wool pledget placed in the pulp chamber and sealed using a zinc oxide/eugenol dressing. A number of treatment options were discussed, including conventional root therapy of both central incisors, followed by composite restorations with possible future orthodontic treatment. Photographs taken at that time show the discoloration of both upper central incisor teeth (Fig. 3). Unfortunately, the patient refused any



Fig. 1. (a & b) Periapical radiographs of the upper left central incisor, taken from different horizontal angles, showing a staple within the pulp chamber.



Fig. 2. Staple and probable food debris removed from tooth.

conservative or orthodontic treatment, and demanded that the incisor teeth were removed and replaced with a denture. The extractions were attempted under local anaesthetic on two occasions, but were unsuccessful because of poor cooperation. The teeth were eventually removed under general anaesthesia.



Fig. 3. Photograph of the discoloured central incisors.

Discussion

A number of foreign objects embedded in teeth have been reported in the literature [1-4], with several cases of needles in root canals being described [5-8]. In two of these cases, the patient had been trying to clean the root canal using the pin when it became lodged. Other radiopaque foreign bodies found in root canals include pencil lead [8], threaded metal screws [9] and glass beads [10].

A staple in the root canal has been reported before [11]. This particular patient was undergoing root canal therapy and the tooth had become symptomatic between appointments. Since the patient had seen the dentist insert 'some pins' into his teeth, he thought that, by doing the same with a staple, that he would experience some pain relief. However, the staple became lodged in the canal. The patient insisted on having the tooth extracted, along with the staple. In the case presented here, the staple was successfully removed from the tooth.

Foreign bodies can act as a focus for infection. Actinomycosis has been reported following a patient lodging a piece of jewellery chain into a maxillary central incisor [12]. Therefore, it is important that an attempt is made to remove the foreign object, if at all possible, during root canal therapy.

A metallic foreign body may be localized using a variety of radiographic methods including:

- 1 parallax views (either horizontal or vertical);
- 2 vertex occlusal views;
- 3 triangulation techniques;
- 4 stereo radiography; and
- 5 tomography.

Parallax views were used in this case to determine that the staple was in the root canal rather than the periodontium, since there had been no displacement of the staple in relation to the root canal when the X-ray tube shifted.

A vertex occlusal view could have been used to assess the position of the staple; however, this view is no longer favoured because of relatively high radiation exposure to the lens of the eye and because the primary beam is aimed towards the abdomen.

The use of two views at right angles to one another (triangulation) could also have been considered for this patient. A cephalometric lateral view with a panoramic view could have been used for this purpose. However, since these views are taken using a cassette, the image quality could have been unacceptable, and the cephalometric view might have been difficult to interpret because of superimposition of the other incisor teeth over the root.

Stereographic views and tomography were not considered since there are no facilities to carry out these investigations at the authors' hospital, and the staple had already been successfully localized using parallax techniques. Radiographs also allow an assessment of how difficult it is likely to be to remove the foreign object. This staple was relatively easily removed since the object was not barbed and it was relatively coronally lodged.

In this case, the staple was removed with a barbed broach. Removal of foreign objects from teeth may be carried out using a variety of methods. Ultrasonic files have been used. Ethylenediaminetetraacetic acid has been suggested as a useful aid in lubricating the canal when attempting to remove the foreign object [13]. The Steglitz forceps have also been described for use in the removal of silver points from the root canal [13]. The Masseran kit, consisting of a number of differently sized trepans which cut a narrow space around the object allowing it to be released, could also have been used.

However, if objects are found close to the apex, it may prove impossible to remove the foreign object, and apicectomy should be considered in these cases. On the other hand, if the object cannot be removed, one may well have to accept this, and prepare and obturate the canal as best one can with the understanding that the long-term prognosis of the tooth may be reduced.

What this case report adds

• An 11-year old boy presented with a staple lodged in the root canal of the maxillary left permanent central incisor.

Why this case report is important to paediatric dentists • Discovery of foreign body embedded in a tooth is uncommon.

• A metallic foreign body may be localised using a variety

of radiographic methods.

Conclusion

This paper has outlined the management of a case of an unusual foreign body in a tooth. The various methods of localizing and removing the object were discussed in the hope that they may be of use to other dental practitioners in the management of similar circumstances. Provided one has good patient cooperation, management of the situation can be quite straightforward if the appropriate diagnostic and treatment tools are utilized.

Résumé. La découverte fortuite d'un corps étranger dans une dent est peu fréquente et demande un examen radiographique afin de déterminer la composition et la localisation de l'objet. Nous décrivons le cas d'un garçon de 11 ans qui présentait une agrafe logée dans le canal radiculaire de l'incisive centrale maxillaire permanente gauche. Cette agrafe a été localisée à l'aide de techniques de parallaxe et retirée avec succès du canal. Les techniques radiographiques de localisation et les méthodes possibles d'élimination des corps étrangers sont discutées.

Zusammenfassung. Der Zufallsbefund eines Fremdkörpers in einem Zahn ist selten und erfordert die röntgenologische Abklärung von Zusammensetzung und Lokalisierung des Objektes. Wir beschreiben den Fall eines 11jährigen Jungen der mit einer Klammer im Wurzelkanal des Zahnes 21 vorgestellt wurde. Die Klammer wurde mittels Parallaxentechnik röntgenologisch lokalisiert und erfolgreich aus dem Kanal entfernt. Die Röntgentechnik und Methoden der Fremdkörperentfernung werden diskutiert.

Resumen. El descubrimiento casual de un objeto extraño incluido en un diente es infrecuente y requiere el examen radiográfico para determinar la composición y localización del objeto. Describimos el caso de un niño de 11 años que se presentó con un alojado en el conducto radicular del incisivo central permanente izquierdo. Esta grapa se localizó usando técnicas de paralelización y se sacó exitosamente del conducto. Se discuten las técnicas radiográficas de localización y los posibles métodos de eliminación de cuerpos extraños.

References

- 1 Hall JB. Endodontics patient performed. *Journal of Dentistry for Children* 1969; **36**: 213–215.
- 2 Gelfman WE, Cheris LJ, Williams AC. Self attempted endodontics – a case report. *Journal of Dentistry for Children* 1969; **36**: 283–284.
- 3 Salven J. The consequences of leaving a root canal open for drainage. *New York Journal of Dentistry* 1971; **41**: 283–286.
- 4 Toida M, Ichihara H, Okutomi T, Nakamura K, Ishimaru JI. An unusual foreign body in an unerupted supernumerary tooth. *British Dental Journal* 1992; **173**: 345–346.
- 5 Harris WE. Foreign bodies in root canals a report of two cases. *Journal of the American Dental Association* 1972; 85: 906–911.
- 6 Nernst H. Foreign body in a root canal. *Quintessence Inter*national 1972; **3**: 33-34.
- 7 Zillich RM, Pickens TN. Patient induced blockage of the root canal. Report of a case. Oral Surgery, Oral Medicine and Oral Pathology 1982; 54: 689–690.
- 8 Lamster IB, Barenie JT. Foreign objects in the root canal. Oral Surgery, Oral Medicine and Oral Pathology 1977; 44: 483–486.
- 9 Prabhakar AR, Basappa N, Raju OS. Foreign body in a mandibular permanent molar – a case report. *Journal of the Indian Society of Pedodontic and Preventive Dentistry* 1998; 16: 120–121.
- 10 Shay JC. Roentgeno-oddities. Foreign body in a tooth. Oral Surgery, Oral Medicine and Oral Pathology 1985; 59: 431.
- 11 Rao A, Sudha P. A case of a stapler pin in the root canal extending beyond the apex. *Indian Journal of Dental Research* 1999; **10**: 104–107.
- 12 Goldstein BH, Sciubba JJ, Laskin DM. Actinomycosis of the maxilla. Review of literature and report of case. *Journal of Oral Surgery* 1972; 3: 362–366.
- 13 Lumley PJ, Walmsley AD. The removal of foreign objects from root canals. *Dental Update* 1990; **17**: 420–423.

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