Case Report

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Stapler pin in the Mandibular Central Incisor Tooth: An Unusual Case of Foreign Body

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Abstract

Accidental finding of a foreign object embedded in a tooth is uncommon. A variety of metallic objects have been discovered inside the pulp/root canals. These foreign objects are mostly self inflicted by patients into the pulp canal and thereby act as potential source of infection. Although most of the techniques mentioned in the literature are effective for the removal of such foreign objects, but still there is no standardized procedure is available for successful removal of unusual foreign metallic objects. Herein, we report a case of a 22-year-old female who presented with a stapler pin lodged in the pulp chamber of mandibular left central incisor, with its successful retrieval using instrument removal system followed by successful endodontic management.

Key words: Central Incisor; Foreign Body; Mandibular; Stapler Pin

Introduction:

Foreign objects impacted in pulp/root canal are seen in young individuals and if asymptomatic, are often diagnosed incidentally during radiological investigations.[1] Detailed case history, clinical and radiographic examinations are necessary to know the nature, size and location of the foreign object as well as difficulties encountered during its retrieval. These foreign objects may act as a potential source of infection and may lead to painful condition. So the management of such teeth requires proper removal of foreign objects and thorough debridement of pulp canals. [2] This case report describes a rare clinical case of a stapler pin, inserted by the patient, which was found incidentally on a radiograph of mandibular left central incisor, with its successful non-surgical retrieval followed by successful endodontic management.

Case Report

A 22-year-old female reported to the Department of Oral Medicine and Radiology, with a chief complaint of blackish discoloration in left lower front tooth since 2 years. There was history of

trauma to mandibular anterior region 4 years back with positive history for food lodgments and intermittent pain. On clinical examination, fractured 31 with discoloration of the coronal portion was observed [Figure 1a & 1b]. On percussion, 31 was nontender without any discharge. Electric pulp testing of 31 gave a negative response. Intraoral periapical radiograph (IOPA) of mandibular anterior region revealed well defined linear, U shaped radiopacity in the coronal portion of 31 and ill-defined periapical radiolucency with respect to 31, 41. [Figure 2a] On the basis of radiographic examination, a metallic object was suspected in the pulp chamber of 31, so the patient was again questioned regarding use of any metallic object. The patient revealed using stapler pins several times to clean the food debris lodged in the fractured tooth. On the basis of patient's history and radiographic finding, a diagnosis of stapler pin in 31 was made and the patient was referred to department of endodontics for retrieval of stapler pin and further management. Under local anesthesia, the foreign object in pulp canal was intercepted with the use of ultrasonic and retrieved

Figure-1 (a & b): Intraoral photograph showing the discolored 31 in labial (1a) and incisal view (1b).

Figure-2: Intraoral periapical radiograph of mandibular anterior region showing U-shaped radiopacity in 31 and periapical radiolucency in 31 and 41.

Figure-3: Retrieved stapler pin.

by Steglitz forceps. [Figure 2b]. After that endodontic treatment followed by crown was planned for 31 and 41. Post-obturation radiograph confirmed the completion of endodontic therapy. [Figure 3]

This timely diagnosis and management of foreign object embedded in the tooth avoided further complications such as pain, bleeding and infection.

Discussion:

Foreign objects in pulp/root canal are extremely uncommon incidental findings.[1] Mostly the anterior teeth are involved in young children, and commonly lodged objects include metal screws, stapler pins, beads, darning needles, toothbrush bristles, pencil leads, and crayons.[3] Grossman and Heaton [4] reported retrieval of indelible ink pencil tips, tooth picks, brads, adsorbent points and even a tomato seed from the pulp canals of anterior teeth. In our case, a stapler pin was lodged into the pulp canal of the left mandibular central incisor.

Younger children usually swallow or insert foreign objects accidentally, however adolescents, swallow or insert foreign objects intentionally. These kinds of behavior problems are commonly categorized as self-injurious behavior. Self-embedding behavior (SEB) is a form of self-injurious behavior involving the insertion of inanimate objects into the soft tissues, either under the skin or into muscles.[5] Awareness of SEB is of utmost importance for effective identification, assessment and interruption of the cycle of self-injury.

The foreign objects lodged in pulp canal can be classified into metallic and non-metallic objects. These foreign bodies are usually detected by radiographs when the patient presents to the dentist either with pain or swelling. Radiographs also aids in assessing the level of difficulty encountered during retrieving the foreign object. McAuliffe et al. [6] has suggested various radiographic methods which are useful to localize radiopaque foreign objects as Parallax views, Triangulation techniques, Stereoradiography and Tomography. Specialized radiographic techniques such as Radiovisiography, 3D CAT scans play an important role in localization of foreign objects inside the root canal. Microscopy and ultrasonic tips can be used as additional tools in foreign object localization. In the present case, the object was easily located using an intraoral periapical radiograph, which revealed the presence of a foreign object in the coronal portion of left mandibular central incisor, as U-shaped radiopacity.

Non-metallic objects, being radiolucent, cannot be identified on radiographs. So if resistance is encountered in a pulp canal that was left open either after trauma or during endodontic treatment, it is suggested to take proper history and do careful instrumentation to prevent apical pushing of the object. The factors influencing the removal of foreign objects will be affected by the diameter, length and position of the obstruction within a canal and the skill of the operator. Although the technology is advanced, still the success rate for the removal of foreign objects from the pulp canals is 55-79% [7].

Many methods have been documented for the removal of foreign objects from the pulp canals, such as hand instrumentation, ultrasonic devices, Masserann Kit, canal finder system, modified Castroviejo needle holders or, sometimes surgical methods also. [3] Ethylene diamine tetra acetic acid (EDTA) has been recommended for lubricating the pulp canal, while trying to remove the foreign object. The use of an operating microscope along with ultrasonic helps the clinician to visualize any intraradicular metallic obstructions. [8] Glick [9] suggested of inserting multiple H-files and twisting them around the foreign body. Conventional endodontic instruments can also be used along with other instruments like ultrasonic equipments, fine forceps, endodontic files, etc.

It has been suggested that the use of calcium hydroxide is the choice for Intracanal medicament in such cases. But, if the infection fails to resolve, triple antibiotic paste should be used (consisting of ciprofloxacin, metronidazole, and minocycline). The paste is packed into the canal and sealed with zinc oxide eugenol cement. Once the tooth in question is asymptomatic, the canal is obturated and subsequent esthetic rehabilitation of the tooth is done.[10] Roig and Greene [11] have demonstrated a simple device, comprising of a disposable 25 gauge dental needle, a thin segment of steel wire, and a small mosquito forceps, to remove broken silver cones.

The Steglitz forceps have also been described useful for removal of silver points. McCulloch [12] has suggested removing small amount of the tooth structure to improve the access. According to Walvekar et al. [13] if the foreign object is snugly bound in the canal, the object may have to be loosened first. For removing objects lying in the pulp chamber, a tissue holding forceps, a small mosquito forceps can also be used. [11] When removing the foreign object from the pulp chamber, care should be taken not to push the object into the root canal or in the inter-radicular soft tissue. For retrieval of objects from the periapical area, periapical surgery or intentional reimplantation should be considered. [14] The prognosis is good when treated immediately with the successful retrieval of the foreign object.

In the present case, the foreign object was located and successfully retrieved by using H-file after conventional access cavity preparation. Irrigation was done using normal saline and sodium hypochlorite solution.

Complications may happen, if the impacted foci of infection are not eliminated on time. Goldstein et al. [15] has documented the development of Actinomyces infection at the apex of the tooth with the radiopaque foreign body in the pulp canal. They concluded that the foreign object aided in establishment of anaerobic conditions necessary for development of infection. Growth of Actinomyces is known to be inhibited by low concentrations of antibiotics, Sodium hypochlorite solution, calcium hydroxide, EDTA, and chlorhexidine. [10] Therefore, in this case, calcium hydroxide was used as Intracanal medicament and sodium hypochlorite as an irrigant.

Other serious complications of foreign object into the pulp canals

reported are chronic maxillary sinusitis of dental origin, [16], rupture of the common carotid artery, aortic pseudo aneurysms, esophageal tears and fistula, pericarditis and cardiac tamponade. [6] Hence, a prompt approach for their retrieval should be executed. Self-attempts by the patient for removal of the object may result in accidental aspiration or ingestion with serious complications.

Conclusion:

Careful pre-operative tooth examination, observation of the preoperative radiograph and a straight line access to the foreign object inside the root canal guides its successful retrieval no matter which technique is employed.

Consent: Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Competing interests: The author declares no competing interests.

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