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Case report

Accidental ingestion of a three-way (air-water-spray) syringe tip during dental procedure recovered by gastroscopy: case report

Fernández Chaves, José Manuel[1]

[1] Specialist in Legal & Forensic Dentistry. Oral Surgery & Pathology. MSc. Health Services Administration. School of Dentistry, University of Costa Rica. Forensic Dentistry Unit, Department of Legal Medicine, Judicial Investigation Agency. Costa Rica. ORCID ID: https://orcid.org/0000-0001-6478-5407

Correspondence:Dr. José Manuel Fernández Chaves[1] -- jfernandezch@poder-judicial.go.cr

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Abstract

The ingestion or aspiration of dental material or instruments is one of the most feared complications in clinical dental practice, it can occur in both children and adults. The mouth is a moist, dark, small area; where the involuntary movements of the patient during the procedures and the small dimensions of the materials and instruments turn dental care into a challenge.

A swallowed or aspirated foreign body during dental treatment can result in serious complications and even death, these depend largely on the shape, size and anatomical pathway through which it passes.

This article describes an uncommon complication of which there is only one report in the literature worldwide, the ingestion of the tip of a triple syringe during a routine dental procedure that was recovered by esophagogastroduodenoscopy. It also highlights the importance of knowing the protocols for handling aspirated or swallowed foreign bodies where a fast and adequate approach during the first minutes can make the difference between life and death.

Keywords

Ingestion, accidental, aspiration, triple syringe, dental treatment, gastroscopy.
Source: DeCS (Descriptors in Health Sciences)

Introduction

In the literature there are many reports of ingestion or aspiration of foreign bodies during the performance of dental procedures, one of the first authors to describe them was Grossman in 1971 who defined that at that time 87% corresponded to swallowing and 13% to aspirations. (1) The frequency with which it can occur in daily clinical practice, according to the literature ranges from 0.0041 to 0.0044%. (2–4)

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Objects such as endodontic files,(5–7) dental implants and/or components,(8) drillbits,(9) crowns,(10) orthodontic brackets and wires,(11)(12) parallelism pins,(13) fixed bridges,(12)(14) molar bands,(15) endodontic irrigation syringe tips,(16) dentalmirrors,(17) Erich arches,(18) are mentioned within the foreign bodies and there is a single case report of ingestion of a triple syringe tip.(19)

Ingested foreign bodies can be classified into: round, sharp or pointed objects, long, food bolus and others; according to the Clinical Guide of Endoscopy of the European Society of Gastrointestinal Endoscopy (ESGE) (20) (Table1).

Table 1. Classification of ingested foreign bodies according to the ESGE.

Type of object	Examples
Round objects	coin, button, toy, batteries or magnets
Sharp or pointed objects	Fine objects: needle, toothpick, pins, bones, pieces of glass Irregular sharp objects: partial dental prosthesis, razor blade
Long objects	Soft objects: laces, ropes Hard objects: toothbrush, cutlery, screwdrivers, pencils or pens
Alimentary bolus	With or without bones
Other	Illegal drug packages

The literature establishes that approximately 90% of objects can cross the gastrointestinal tract without producing major complications, 10% require recovery by endoscopy and less than 1% require surgical approach. (1)(4)(4)(20)

Some dental implements developed to isolate the field of work such as the rubber dam decrease the possibility of ingestion or aspiration of foreign bodies, however it is not always possible to perform this type of isolation. (21)

There are multiple variables that can increase the degree of difficulty of a procedure such as the age of the patient, the area to be treated, the type of procedure, the use of sedation, systemic conditions, etc. These variables together with the degree of experience have been described in this type of complication, however there is controversy in the studies because the information has been collected incompletely, this problem is presented in the same way in the dental records in Costa Rica both in physical and digital formats according to previous studies. (23)(24)

A review of 617 cases of aspiration and ingestion of foreign bodies, showed that in the different areas of dentistry the majority of ingestions correspond to Prosthodontics, secondly to Endodontics, in third place Restorative and in fourth place Oral Surgery, however the largest number of cases of aspiration reported corresponds to Implantology. (25)

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Methodology

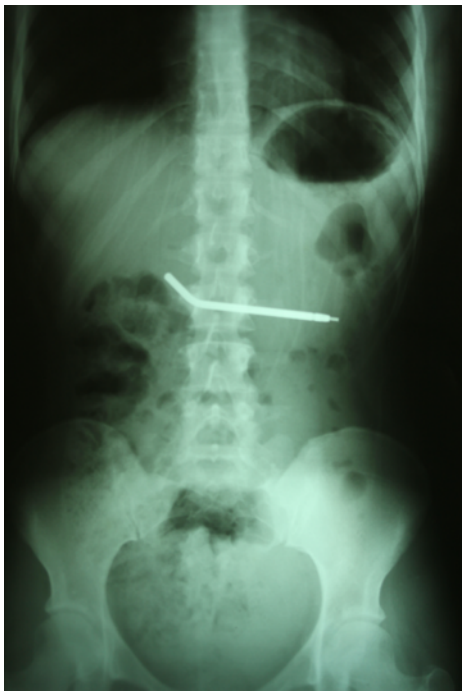
The case of a female evaluated in the Forensic Dentistry Unit of the Department of Legal Medicine is described together with a review of the literature. An extensive search was carried out in the following databases: PubMed, Scielo, ClinicalKey and Cochrane Library, using as filters "accidental", "ingestion","aspiration", "foreing bodies" and "dental ". Articles in English related to the ingestion or aspiration of foreign bodies during dental procedures were selected.

Case Presentation

A 16-year-old female presented herself to a consultation for a routine dental cleaning. During the procedure the operator used the spray to clean the oral cavity and the tip of the triple syringe came off and was swallowed by the user.

The patient did not show at that time any signs of respiratory distress, the procedure was being carried out in an hospital dentistry service so she was immediately transferred to radiology where a simple x-ray of the abdomen was performed, the foreing body was located in the gastrointestinal area. (Figure 1).

Later she was transferred to another hospital where she underwent an emergency esophagogastroduodenoscopy where the foreign body was recovered without the need for surgical procedures, no lesions were reported in the gastroesophageal mucosa (Figure 2).



Discussion

Among the multiple articles that report ingestion or aspiration of foreign bodies during dental treatment (1-23), there is only one report in addition to this article of a component of dental equipment as such, specifically a triple syringe tip(19).

Figure 1. Simple x-ray of the abdomen where the location of the foreign body at the gastrointestinal level is confirmed.

LEGAL MEDICINE JOURNAL OF COSTA RICA

ISSN 2215-5287

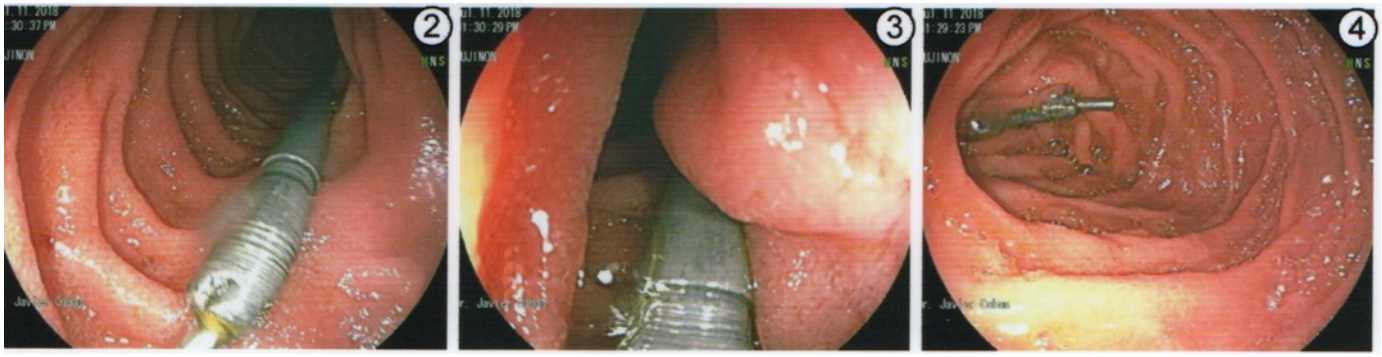
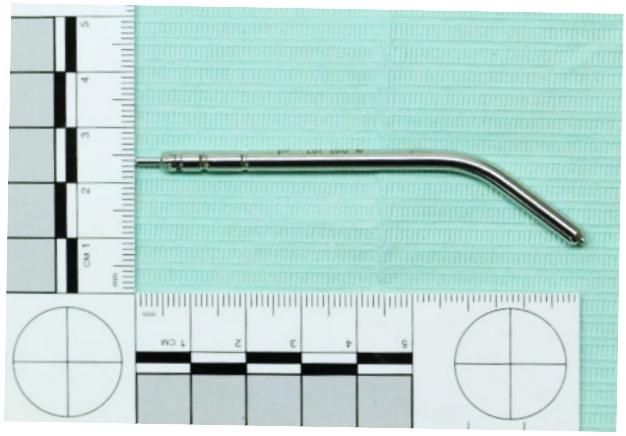


Figure 2. Esophagogastroduodenoscopy, note the presence of the triple syringe tip at the duodenal level



A triple syringe tip that is used for cleaning with water, spraying or air drying; it is just over eight centimeters in length (Figure 3), is made of stainless steel and has a pointed end that makes up the coupling (Figure 4) that is inserted into the handle of the syringe designed to be held under pressure by a retractable system that makes it easily removable to change it between the care of one patient and another (Figure 5).

Figure 3. Triple syringe tip

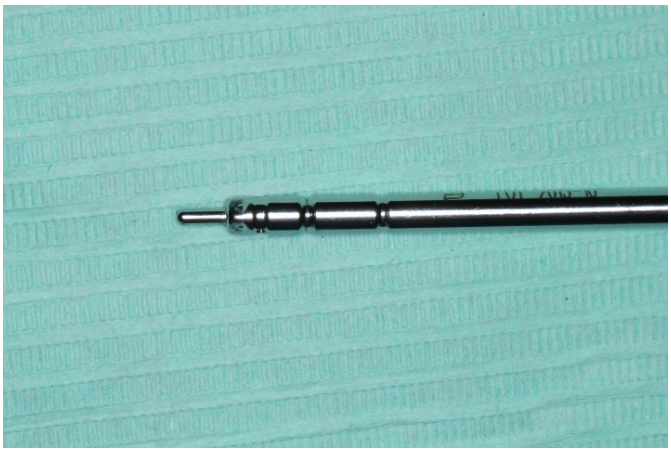


Figure 4. Triple syringe tip coupling

Figure 5. Retractable fastening system, arrows indicate where the ring should be pushed.

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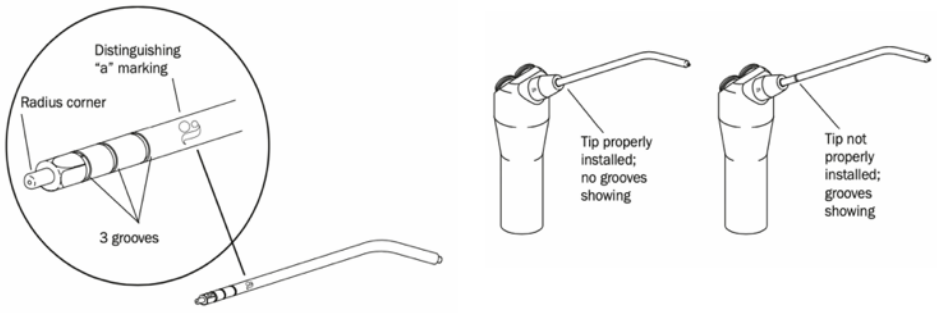

Figure 6. Diagram of correct installation of a triple syringe tip (29)

Figure 7. Water and air buttons

Improper placement (Figure 6),wear and tear of the equipment, the use of an incompatible tip or the inadvertent manipulation of the retractable system can easily cause the device to disconnect during dental treatment, especially due to the pressure that is released by pressing the water and air buttons together to generate spray (Figure 7); however, it is difficult to establish which variables occur at the intraoperative level in a specific case.

The wide variety of instruments and materials required to perform dental procedures mean that although this complication is infrecuent, (2–4) all treatments require a high degree of attention to prevent these events from resulting in endoscopic (26) or surgical procedures such as laparotomies, lung resections and even death. (25)

On the otherhand, it is worth noting that although there are only two cases worldwide reported on the ingestion of a triple syringe tip, it is necessary to incorporate within the care protocols, the verification of the proper functioning and condition of the dental equipment, especially in components that are removable and can be detached during a treatment. (26)(28).

Recommendations

Among the recommended measures to follow in case of ingestions or aspirations during the dental consultation are:

1. Have a previously established protocol that involves dental professionals, dental assistants and administrative staff that allows to react promptly and effectively.
2. Verification of the condition of dental instruments and equipment as part of a periodic maintenance protocol that seeks the satisfaction of users. (29)
3. It is specifically advisable to check the proper placement and functioning of the tip of the triple syringe outside the mouth of the patient before using air, water or spray.
4. Staff update on the management of airway obstructions by foreign bodies and cardiopulmonary resuscitation.
5. Prior coordination with nearby hospital centers that can provide prompt care in the event that an emergency transfer is required.

ISSN 2215-5287

Informed consent

The mother of the patient signed the informed consent and requested this case be published to raise awareness among the personnel who provide dental services and prevent this type of situation from recurring.

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