



Dental needle foreign body in the neck: a case report

Hassen Mohammed¹, Nabil Shallik^{2,3,4,5}, Mina Barsoum¹, Majid Al Abdulla¹, Zynel Dogan⁶, Hassan Haidar Ahmed^{1,7}, Abbas Moustafa⁸

¹Hamad Medical Corporation, ENT-ORL Department, Doha, Qatar

²Hamad Medical Corporation, Anaesthesia, ICU and Perioperative Medicine Department, Doha, Qatar

³Qatar University, Clinical Anesthesiology Department, Doha, Qatar

⁴Weill Cornell Medical College in Qatar, Clinical Anesthesiology Department, Doha, Qatar

⁵Tanta Faculty of Medicine, Anaesthesia and SICU Department, Tanta, Egypt

⁶Plastic and Head and Neck Surgery Department, St. Anna Hospital Vogelsangstraße, Wuppertal, Germany

⁷Weill Cornell Medical College in Qatar, ENT-ORL Department, Doha, Qatar

⁸Hamad Medical Corporation, Clinical Radiology and Medical Imaging Department, Doha, Qatar

Foreign body (FB) ingestion is commonly seen in the ear nose and throat (ENT) field, with different presentations and sequelae. FBs can arrest in the upper aerodigestive tract or continue further down into either the airway tract to the bronchus or the digestive tract to the intestines. The pathway of an FB depends on the size and shape of the FB and how sharp its edges are. Since the 20th century, the use of disposable stainless-steel needles in the oral cavity has proven to be an effective and safe method for performing various intraoral procedures like dental infiltration or a root canal wash. Complications from their use are rare. Generally, dental needle breakages are caused by patients biting the needle, incorrect injection techniques, or inadequate preventative measures. The sudden movement of a patient during a procedure is one of the most common causes of breakage. Occasionally, needles are swallowed during dental procedures such as a root canal. Here, we report a case of a patient that swallowed a broken needle during a dental procedure. A few days later, the patient presented with neck pain, swelling, and a FB sensation. When the patient presented, she claimed that her symptoms had onset after consuming a meal containing duck meat. Initially, the patient was diagnosed as having ingested a duck bone. However, intraoperatively, the FB was discovered to be an injection needle that had migrated from the throat to the neck.

Keywords: Duck Bone; Foreign Body; Three-Dimensional Imaging; Virtual Endoscopy.



This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.



INTRODUCTION

In a case series of 16 patients that had swallowed a broken anesthetic needle, it was found that the majority of the patients had moved suddenly while the injection was being administered. In at least nine cases, the dentists admitted to having bent the needle before inserting it.

Furthermore, cases were also reported of patients moving suddenly while the needle was repositioned *in-situ*, resulting in the needle breaking after hitting bone. In this case series, no attempt was made to visualize or extract the broken needle portions [1].

To our knowledge, this is the first reported case of a patient presenting with neck pain and swelling after swallowing a dental needle.

Received: February 3, 2020 • Revised: February 25, 2020 • Accepted: March 8, 2020

Corresponding Author: Nabil Shallik, Hamad Medical Corporation, Anaesthesia, ICU and Perioperative Medicine Department, P.O. Box. 3050, Doha, Qatar, Qatar University, Clinical Anesthesiology Department, Doha, Qatar, Weill Cornell Medical College in Qatar, Clinical Anesthesiology Department, Doha, Qatar, Tanta Faculty of Medicine, Anaesthesia and SICU Department, Tanta, Egypt
E-mail: Nabilsholik66@hotmail.com

Copyright© 2020 Journal of Dental Anesthesia and Pain Medicine

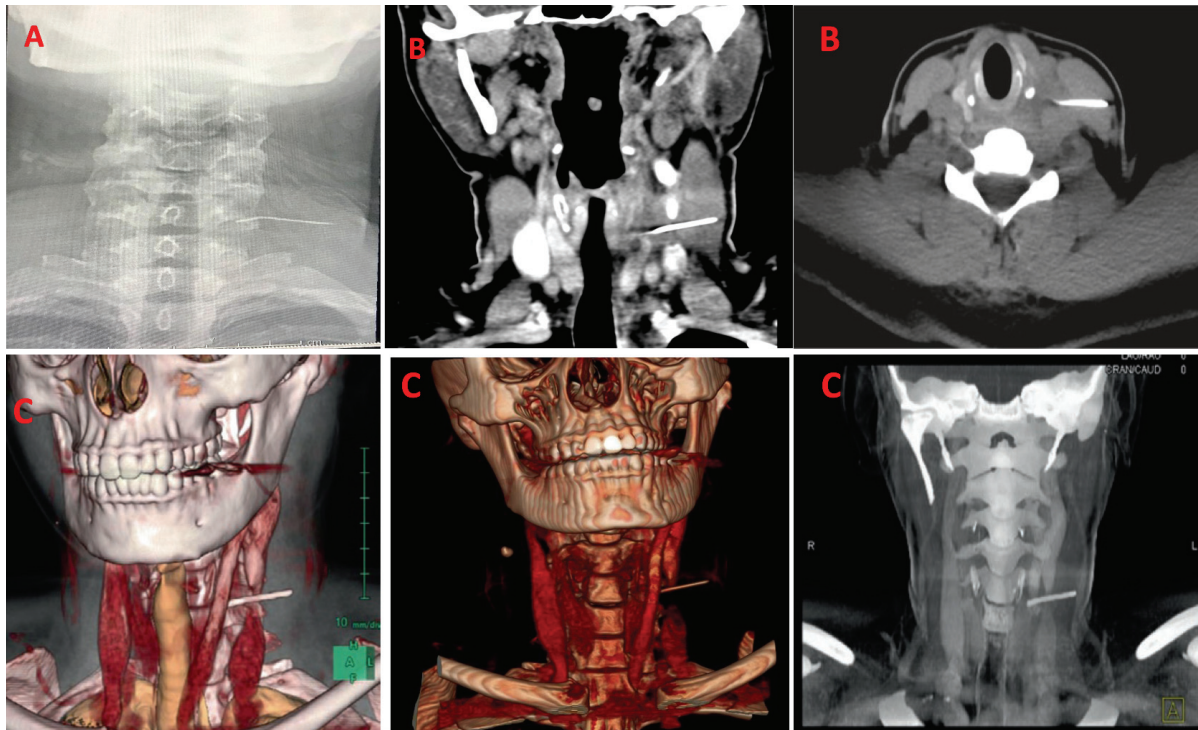


Fig. 1. A: X-ray showed a long, thin, smooth, and impinged foreign body (FB) at the C5-C6 level, lying lateral to the esophagus. B: Computed tomography (CT) of the neck confirmed a metallic density FB, that was 3 cm in length, had pierced through the left internal jugular vein (IJV), and the left sternocleidomastoid muscle (SCM). C: 3-dimensional (3D) reconstructed images.

CASE REPORT

Here, we present a case of a 29-year-old healthy female, who was referred to our ear nose and throat (ENT) department with throat pain that had lasted 12 days. She claimed that the onset of the pain was immediately after consuming a meal containing duck, thereby assuming she had swallowed a duck bone. Due to the pain, she had presented to a primary health care center where she was prescribed painkillers and antibiotics for pharyngitis, but unfortunately, was sent home without imaging. Her pain persisted over the following few days. Hence, she went back to the primary health center, and at this point, a soft tissue neck x-ray was taken, with anteroposterior and lateral views. A foreign body (FB) was found, and the patient was urgently referred to our ENT department.

A thorough ENT, head and neck examination was performed, including a flexible fiberoptic naso-pharyngo-

laryngoscopy, which did not reveal any evidence of a FB in the upper aerodigestive tract. There was a tender, non-fluctuant, diffuse swelling of about 2 x 2 cm on the left side of the neck at the level of the thyroid cartilage. No skin changes were noted in the neck, and there were no signs of an external local injury. To our surprise, due to the recent history of duck bone ingestion, the X-ray (Fig. 1A) showed a long, thin, smooth, and impinged FB at the C5-C6 level, lying lateral to the esophagus.

1. Investigations

Computed tomography (CT) of the neck (Fig. 1B) confirmed a metallic density FB, that was 3 cm in length, had pierced through the left internal jugular vein (IJV), and the left sternocleidomastoid muscle (SCM). Furthermore, its lateral end was in the subplatysmal plane, as shown on the 3-dimensional (3D) reconstructed images (Fig. 1C). The 3D reconstruction and virtual endoscopy (VE) images were useful for localizing the FB and in surgical planning. These sophisticated imaging techniques

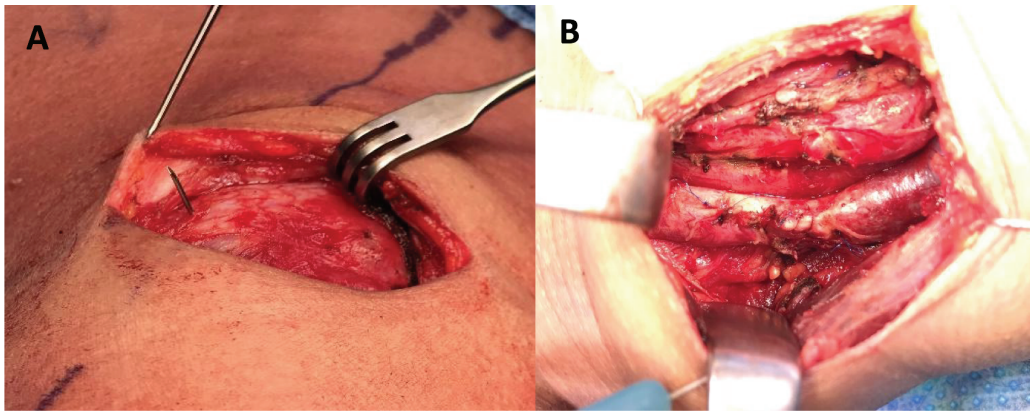


Fig. 2. Once the platysma muscle was incised, a needle tip was seen protruding through the SCM (A). After removing the needle safely, bleeding from the tear in the internal jugular vein was controlled with a 5.0 prolene suture (B).

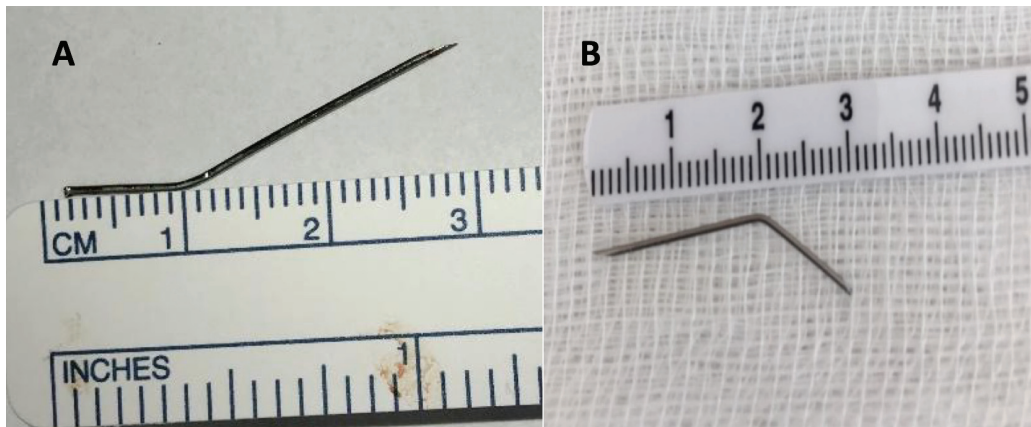


Fig. 3. The removed foreign body (A) is almost identical to the needle that we used in the simulation (B).

provided additional information that helped to clarify the location and characteristics of the FB, thereby defining our surgical management plan and approach.

Upon further interrogation, the patient was quite certain that she had not accidentally swallowed any needles or pins and gave only a past surgical history of a tonsillectomy 10 years previously.

2. Surgical Management

After the patient had given informed consent, she was taken to the operating theatre for neck exploration and removal of the FB under general anesthesia. Using surface markings outlined from the reconstructed images, a 5-cm transverse incision was made in a skin crease over the sternocleidomastoid (SCM) at the approximate location of the needle. Once the platysma muscle was

incised, a needle tip was seen protruding through the SCM (Fig. 2A). Prior to removing the needle, further dissection along the anterior border of the muscle was performed to expose the internal jugular vein (IJV). The needle was noted to be passing through the IJV, approximately 1 cm anterior to the common carotid artery. Vascular loops were used to control the IJV cranially and caudally. After removing the needle safely, bleeding from the tear in the IJV was controlled with a 5.0 Prolene suture (Fig. 2B). Valsalva was performed by the anesthetist to confirm hemostasis, and a closed suction drain was inserted in the neck as a precaution in case of a hematoma. After that, the wound was closed in the usual fashion. A rigid esophagoscopy was performed at the end of the procedure to check the site of esophageal perforation, if any. There were no

significant findings. On close examination of the FB, it was identified as an injection needle with a bore and a pinged proximal end suggesting that it had broken from its base. The patient had an uneventful postoperative recovery course and was discharged after 2 days.

When the needle was shown to the patient, she recalled having a dental procedure in which she was given an intraoral local anesthesia 2 weeks prior to her current presentation. The procedure was done in her home country while she was on holiday. Therefore, no official records were able to be reviewed. The patient was not able to recall significant symptoms during or after the dental treatment as she had received local anesthesia. Although there is no definitive evidence that the FB originated from this dental procedure, it appears to be the most logical explanation. We attempted to make a simulation to compare needle sizes and structure. We used a 23-gauge needle and bent it as if preparing for an intraoral injection. The removed FB (Fig. 3A) is almost identical to the needle that we used in the simulation (Fig. 3B).

DISCUSSION

There have been many case reports in the literature that have reported needle ingestions. Some of these have involved the lung, causing pneumothorax [2], the lower gastrointestinal (GI) tract, and the neck. A number of published articles have found that needles with a small-diameter break more easily than those with a larger diameter [3]. Needle breakage can occur if an incorrect dental needle length or diameter is selected. Research by Pogrel, (1) showed that the probability of needle breakage occurring was higher when a smaller needle was used and when the needle was bent before injection for an inferior alveolar nerve block.

The reported cases in the literature have involved accidentally ingested sewing needles [4,5], broken injection needles by intravenous (IV) drug abusers [6-9], the swallowing of needles during dental procedures such as root canals or needles breaking during irrigation [10,11].

Many reports have described how IV drug addicts use the neck as a portal for drug delivery after all their other peripheral veins collapse. Before injecting, they tend to bend the needle and then re-straighten it multiple times, which weakens its structure. Besides, they often fall asleep while injecting their drugs, and this results in the needle breaking in the neck. In such cases, the needle tips are always in the medial direction [7,8]. In our case, the tip was pointing laterally, without evidence of any local external skin injuries. These findings rule out external injection as the cause and indicate that the needle had traveled from the upper aerodigestive tract and was extruding outwards through the neck.

Although the actual source of the needle in our case is still obscure (either a broken needle inside the tissue or accidentally swallowed), we firmly believe that it was from her dental procedure. After the surgery and successful removal of the FB, the patient recalled vague throat and neck pain following her dental procedure but did not consider it significant. The pain progressively worsened after eating a meal, during which she thought she had accidentally swallowed a duck bone, and hence related her neck pain to this.

Since human error is inevitable, we must create systems and follow safety measures to reduce the incidence of FBs and prioritize patient safety. Specific procedures such as checklists and counts during and/or after every procedure should be implemented to avoid preventable procedure-related errors [12]. Health care professionals should also report any surgical errors as soon as they are recognized.

Learning points:

1. A thorough history is essential for establishing a correct diagnosis.
2. Health care professionals need to report any surgical errors as soon as they are recognized.
3. VE and 3D reconstruction are important tools in the diagnosis of airway pathology.
4. A multidisciplinary team of surgeons, radiologists, and anesthesiologists is crucial in cases with difficult airway management.

In conclusion, the majority of intraoral needle breakages occur during the administration of inferior alveolar nerve blocks or a root canal wash, and in patients who suddenly move as the injection is being administered. Needles should not be bent prior to injections being administered. Additionally, needles should not be inserted up to their base to help facilitate their retrieval if an accidental breakage occurs intraorally. Clinicians performing intraoral procedures should also use larger-gauge needles when possible, as smaller needles are more susceptible to accidental breakages.

AUTHOR ORCID*s*

Hassen Mohammed: <https://orcid.org/0000-0002-9237-7803>
Nabil Shallik: <https://orcid.org/0000-0002-8247-4394>
Mina Barsoum: <https://orcid.org/0000-0003-3798-937X>
Majid Al Abdulla: <https://orcid.org/0000-0002-3631-2650>
Zynel Dogan: <https://orcid.org/0000-0002-8998-6536>
Hassan Haidar Ahmed: <https://orcid.org/0000-0001-5523-0450>
Abbas Moustafa: <https://orcid.org/0000-0002-7287-5100>

AUTHOR CONTRIBUTIONS

Hassen Mohammed: Methodology, Writing - original draft, Writing - review & editing
Nabil Shallik: Conceptualization, Investigation, Methodology, Supervision
Mina Barsoum: Investigation
Majid Al Abdulla: Supervision
Zynel Dogan: Conceptualization, Methodology
Hassan Haidar Ahmed: Data curation, Formal analysis, Investigation, Methodology
Abbas Moustafa: Methodology

CONFLICTS OF INTEREST: There are no conflicts of interest to declare.

PATIENT CONSENT: Informed consent was obtained.

FINANCIAL SUPPORT AND SPONSORSHIP: None

REFERENCES

1. Pogrel MA. Broken local anesthetic needles: a case series of 16 patients, with recommendations. *J Am Dent Assoc* 2009; 140: 1517-22.
2. Reinmuth N, Förster R, Scheld HH. From the neck to the lung: pneumothorax caused by a lost needle. *Eur J Cardiothorac Surg* 1995; 9: 216-7.
3. Augello M, von Jackowski, J, Grätz KW, Jacobsen C. Needle breakage during local anesthesia in the oral cavity— a retrospective of the last 50 years with guidelines for treatment and prevention. *Clin Oral Investig* 2011; 15: 3-8.
4. Unadkat N, Talwar R, Tolley N. The eye in the neck: removal of a sewing needle from the posterior pharyngeal wall. *Case Rep Med* 2010; 608343.
5. Tomilov II, Leman P. Removal of sewing needle from the soft tissues of the neck. *Zh Ushn Nos Gorl Bolezn* 1973; 33: 108-9.
6. Aggarwal S, Kumar A. Imaging quiz; Intravenous drug use; multiple broken needle tips in the neck. *AJNR Am J Neuroradiol* 1994; 15: 658, 774.
7. Hutchins KD, Williams AW, Natarajan GA. Neck needle foreign bodies: an added risk for autopsy pathologists. *Arch Pathol Lab Med* 2001; 125: 790-2.
8. Williams MF, Eisele DW, Wyatt SH. Neck needle foreign bodies in intravenous drug abusers. *Laryngoscope* 1993; 103: 59-63.
9. Dickinson ET, DeRoos FJ. Images in emergency medicine. Chronic neck pain from a retained needle as a result of intravenous drug use. Acute neck abscess and cellulitis with retained needle fragments as a result of intravenous drug use. *Ann Emerg Med* 2007; 50: 198, 210.
10. Yadav RK, Yadav HK, Chandra A, Yadav S, Verma P, Shakya VK. Accidental aspiration/ingestion of foreign bodies in dentistry: a clinical and legal perspective. *Natl J Maxillofac Surg* 2015; 6: 144-51.
11. Srivastava N, Pandit I, Nikhil V, Gugnani N. Accidental swallowing of a hypodermic needle. *Int J Clin Pediatr Dent* 2009; 2: 60-2.
12. Gibbs VC, Coakley FD, Reines HD. Preventable errors in the operating room: retained foreign bodies after surgery--Part I. *Curr Probl Surg* 2007; 44: 281-337.

1. Pogrel MA. Broken local anesthetic needles: a case series