DOI: 10.7860/JCDR/2024/67383.19031

Case Report

Surgery Section

Open Surgical Retrieval of a Foreign Body in the Neck: A Case Report

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ABSTRACT

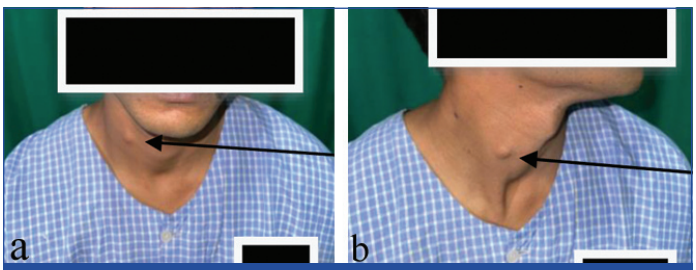
Foreign body retention in the neck may be either traumatic or iatrogenic. Penetrating neck injuries with retained bodies are critical, as the neck serves as a passage for structures essential to life. Therefore, prompt detection and retrieval of the foreign body are paramount in preventing mortality. Here, authors present a case in which a successful surgical retrieval was performed without any postprocedural complications, despite the patient presenting relatively late after the injury. In this case report, a 23-year-old male labourer presented with a right-sided neck swelling two months after a workplace injury involving a shattered metal plate. Imaging confirmed a 15×5 mm hyperdense metallic object penetrating the sternocleidomastoid muscle. Successful open exploration extracted a 1.5 cm metallic shard at the C6 vertebral level, with no major vessel or airway damage. Postoperatively, the patient exhibited no movement restrictions, highlighting the atypical presentation of a retained metallic foreign body and the importance of timely intervention and comprehensive imaging for successful management.

Keywords: Hyperdense metallic objects, Neck swellings, Occupational injury, Sternocleidomastoid muscle

CASE REPORT

A 23-year-old male labourer presented at the surgery clinic with a swelling on the right-side of his neck, two months after experiencing an injury at his workplace while doing fabrication work involving the use of stainless steel material for making windows, grills, etc. While doing fabrication work, a metallic piece accidentally blew out and caused a penetrating injury to the neck. The patient did not pay much attention to the injury because of the absence of any signs and symptoms. However, the patient gradually developed a swelling at the same site over a period of two months, which was not associated with fever, and there was no difficulty in performing movements of the neck. There was no history of any change in voice and dysphagia. Additionally, there was no reported history of headaches, fainting, or seizures. The patient did not sustain any other injuries. As per the history given by the patient, no radiological investigations were done immediately after the injury.

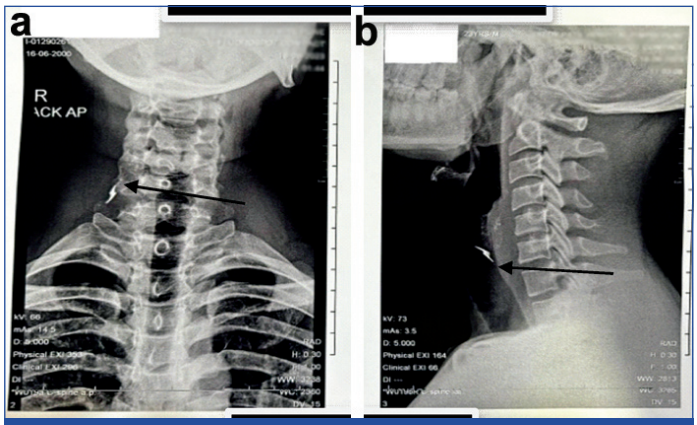
Upon examination, the patient was conscious, oriented, and had stable vitals. A 1×1 cm swelling was visible over the middle region of the neck on the right lateral side [Table/Fig-1a,b], approximately 10 cm inferior to the mandible, 5 cm superior to the sternal notch, and 4 cm lateral from the midline. The swelling became more prominent when the face was turned to the opposite side. There was no apparent scar or redness on the overlying skin. On palpation, a firm 1×1 cm, non fluctuant, non transilluminant swelling was found, with minimal tenderness and induration around the swelling, and no local rise in temperature. It was non compressible and did not move with swallowing or protrusion of the tongue. No crepitus was evident on palpation.



[Table/Fig-1]: Image of the patient showing the neck selling as seen: a) from the front; b) from the right lateral side.

Routine laboratory investigations, including haemogram, renal function tests, liver function tests, serum electrolytes, and serology, were conducted and found to be within normal limits.

An X-ray of the neck in the anteroposterior/lateral view [Table/Fig-2a,b] revealed a linear radio-opaque foreign body 2 cm below and lateral to the hyoid, with no changes in the airway or bony structures.

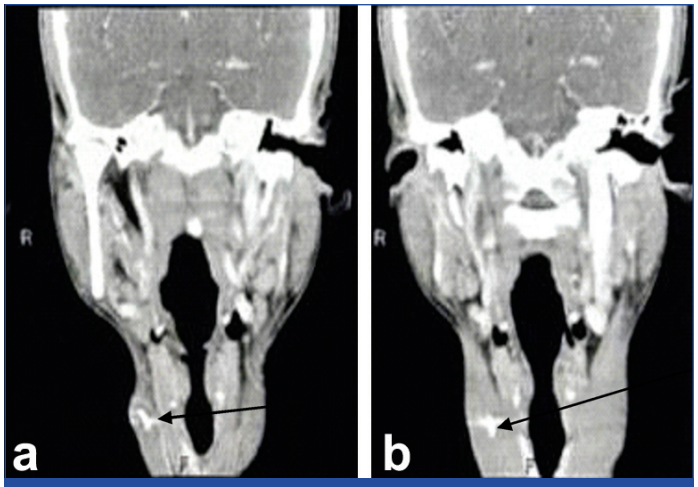


[Table/Fig-2]: a) X-ray neck anteroposterior view. b) X-ray neck lateral view. Radio-opaque foreign body is shown with an arrow.

Ultrasonography (USG) of the neck showed an echogenic focus of size 3.3×3.5×3.8 mm in the subcutaneous plane on the right-side of the neck, indenting the sternocleidomastoid muscle, located away from the great vessels, suggestive of a retained foreign body. However, images could not be procured due to technical issues.

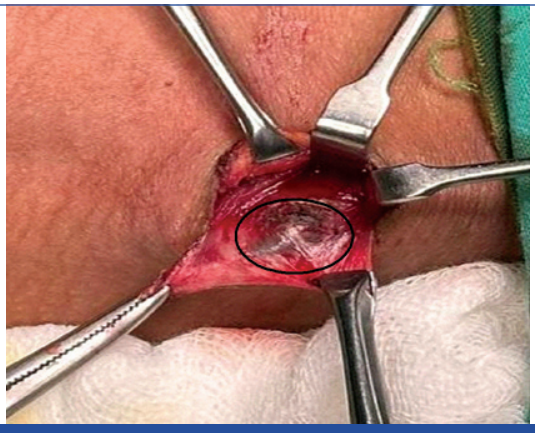
Computed Tomography (CT) scan of the neck [Table/Fig-3] revealed a well-defined hyperdense metallic foreign object of size 15×5 mm, piercing through the skin and subcutaneous plane into the belly of the right sternocleidomastoid muscle, with adjacent air foci and oedema noted in the region. There was no obvious vascular/tracheal injury noted.

The patient underwent an open exploration of the neck under general anaesthesia. A single, zig-zag-shaped, 1.5 cm metallic shard was retrieved from between the fibers of the sternocleidomastoid, at the C6 vertebral level. There was no evidence of injury to any major vessel or airway structure [Table/Fig-4-6]. No additional fragments were found intraoperatively, and the incision was meticulously



[Table/Fig-3]: CT scan neck. Coronal section of this CT scan image is obtained from base of the skull till upper part of neck. Foreign body is demonstrated with an arrow.

[Table/Fig-4]: Intraoperative photograph of metallic foreign body.



[Table/Fig-5]: Intraoperative plane of foreign body. (Foreign body plane is demonstrated with oval shaped circle).

[Table/Fig-6]: Photograph of retrieved FB.

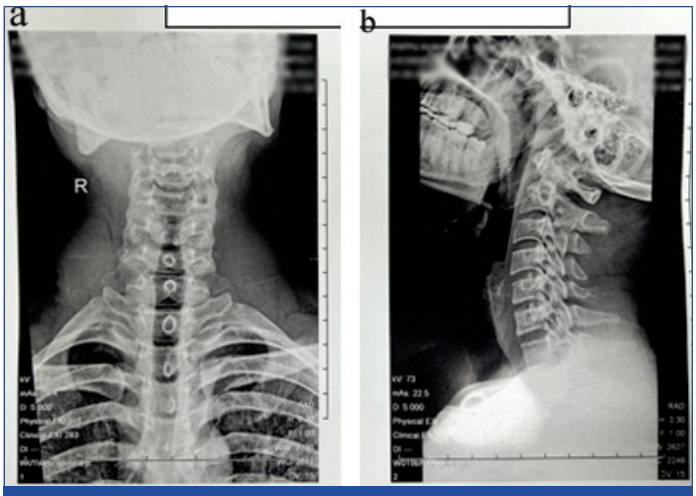
closed using subcuticular sutures after confirming haemostasis [Table/Fig-7,8].

[Table/Fig-7]: Postoperative image of subcuticular sutures.

[Table/Fig-8]: Postoperative image after four weeks postprocedure.

The patient recovered well after the procedure with no residual neck movement restriction or any other neuromuscular deficits, which were assessed by clinical examination, including neck movements in the immediate postoperative period as well as two weeks postprocedure.

Postoperative X-ray revealed no retained fragments and confirmed complete removal [Table/Fig-9a,b].



[Table/Fig-9]: Postoperative X-rays a) Anteroposterior view. b) Lateral view.

DISCUSSION

The neck acts as a passage for several anatomical structures essential to life. Therefore, an injury in this region may have a significantly severe outcome compared to other regions. The neck is bound by the mastoid process and body of the mandible superiorly, the trapezius muscle laterally, the clavicle inferiorly and a line drawn at the midline of the neck medially. The major vessels passing through the neck are the common, internal and external carotid, and external and internal jugular veins [1].

About 5-10% of all trauma cases are penetrating neck injuries. It is important to diagnose and treat penetrating neck injuries due to the presence of the structures which can be grouped as follows:

1. Airway: Trachea, larynx, and lungs
2. Vascular structures: The carotid, jugular, azygos, and aortic arch branches
3. Gastrointestinal: Pharynx and oesophagus
4. Nervous system: Cranial and peripheral nerves, brachial plexus, and spinal cord [2].

Penetrating injuries can involve any of the above structures, leading to high morbidity and mortality. The overall mortality rate in penetrating neck injuries is 9% [3]. Although the diagnosis of a retained foreign body after a penetrating neck injury is fairly apparent from the history and clinical examination, identification of small or thin objects is challenging [4].

The approach to haemodynamically stable patients with penetrating neck injuries has changed over time. The zonal approach, previously in use, was based on the operative constraints of the surgeon. Compulsory endoscopy and angiography for Zone I and III and open exploration for Zone II injuries became the norm as it was a selective approach. Currently available, sensitive CT angiograms can triage and guide a safer selection of patients requiring surgical exploration in a non invasive manner. Furthermore, comments can be made on trajectory and depth by such imaging, which are invaluable in managing such injuries. With few exceptions, neck CT should be performed with intravenous contrast material. It can be used to identify abscesses or necrotic areas and highlights unusually enhanced phlegmonous and neoplastic tissues. About 5-10% of trauma cases include penetrating neck injuries. Due to the increased potential harm to the critical neck structures, such injuries are serious and necessitate prompt surgical examination [5,6].

To summarise, in index case, after surgical incision, tissues were carefully dissected to expose the sternocleidomastoid muscle and surrounding structures to ensure accurate localisation and minimise the risk of damage to surrounding vital structures. The metallic foreign body, previously identified through imaging (CT scan), was located within the sternocleidomastoid muscle. After ensuring accurate localisation and minimal risk of damage to surrounding vital structures, the foreign body, which was a 1.5 cm long metallic shard, was extracted, and after ensuring haemostasis, the surgical site was carefully closed, ensuring optimal wound healing. The patient recovered well after the procedure with no residual neck movement restriction or any other neuromuscular deficits.

Metallic fragments that contain a higher percentage of iron can be removed by a magnet from an open wound or incision [6]. Neodymium-based magnets are commonly used in orthodontic dental procedures to treat impacted teeth. Recent advancements in the flux density of magnets have made it possible to gain sufficient attraction with smaller-sized magnets. A stack of magnets must be held close to the wound opening to exert the adequate required force to retract the foreign body. In addition, the magnet should be positioned accurately to ensure that the point of maximum attraction is directed at the location of the fragments [7]. Small and superficial (0.5-1 cm) objects are amenable to removal by this method safely. Removal or displacement of other metallic objects such as clips or stents as an accident, while a possibility, is not an actual risk as with Magnetic Resonance Imaging (MRI) magnets, as the field intensity can be manipulated to act precisely at the desired location. The magnets can be sterilised and reused, which makes the method cost-efficient [8].

CONCLUSION(S)

Index case of a 23-year-old male labourer with a neck swelling following a workplace injury involving a shattered metal plate was presented in which the foreign body, identified as a metallic shard, was successfully located and removed from the right sternocleidomastoid muscle through open exploration. The patient exhibited a smooth recovery with no residual deficits, highlighting the importance of prompt diagnosis and appropriate surgical intervention in penetrating neck injuries to prevent potential complications.

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PLAGIARISM CHECKING METHODS: [Jain H et al.]

- Plagiarism X-checker: Sep 07, 2023
- Manual Googling: Nov 22, 2023
- iThenticate Software: Dec 25, 2023 (4%)

ETYMOLOGY: Author Origin

EMENDATIONS: 5

AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Sep 05, 2023**
Date of Peer Review: **Nov 09, 2023**
Date of Acceptance: **Dec 28, 2023**
Date of Publishing: **Feb 01, 2024**