A case of tiny foreign body hidden in the neck for 27 years

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Ming Huang, Na Wang and Shuang-Lin Qin participated in research design. Na Wang, Zhi-Hua Hu and Yu-Fei Zheng conducted experiments. Ming Huang and Na Wang performed data analysis. Ming Huang and Na Wang wrote the original draft. Shuang-Lin Qin revised the manuscript. All authors contributed to the article and approved the submitted version.

Competing interests
The authors declare no conflicts of interest.

Abstract
Neck trauma has the characteristics of diversity, complexity, and danger. Mild injuries generally require debridement and suturing or symptomatic treatment. In severe cases, acute laryngeal obstruction, subcutaneous emphysema, severe deformation and collapse of laryngeal and tracheal cartilage, or damage to adjacent organs may occur. If not diagnosed in a timely manner or mishandled, it can endanger the patient’s life or leave sequelae. If foreign body residue is caused by head and neck trauma, a reasonable judgment should be made based on the patient’s condition and corresponding measures should be taken. Accurate localization of foreign bodies before and during surgery, as well as appropriate surgical methods, are key to ensuring successful treatment. This article reports a case of a small foreign body in the neck admitted to Xiangning Central Hospital at the end of January 2023.

Keywords: neck trauma; foreign body; metal nodule

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**Introduction**

Neck trauma is a prevalent condition in otorhinolaryngology, often accompanied by the presence of metallic foreign bodies embedded in the tissues resulting from injuries such as explosions and gunshot wounds [1, 2]. The neck area is highly vascularized, hosting significant blood vessels and nerves. Upon the introduction of a foreign body into the body, an inflammatory reaction typically ensues. After a period of time, some foreign bodies may be naturally expelled. However, when a foreign body cannot be expelled, it often triggers the aggregation of macrophages, foreign-body giant cells, leukocytes, and fibroblasts around it, forming nodular lesions known as foreign body granulomas, which can lead to severe complications [3-5]. Prompt removal is particularly crucial for small foreign bodies. Notably, foreign bodies located in the neck possess a propensity for displacement, as their position can change during intraoperative manipulation. Preoperative localization can only serve as a reference. The shifting position of foreign bodies adds complexity to the surgical procedure, but relocating the foreign body within the neck can help address this challenge. In this report, we present a case of a small foreign body in the neck admitted to Xianning Central Hospital in late January 2023.

**Medical records**

The patient has signed the informed consent form. The patient, a 33-year-old male, has had a foreign body in his neck for 27 years. 27 years ago, the patient and his uncle went hunting together in the mountains. Unfortunately, due to his uncle’s carelessness, a lead bullet somehow ended up in the patient’s left neck. The family immediately rushed him to the local hospital for treatment. In recent years, the patient has noticed persistent dull pain, swelling, and infection in his jaw. Recalling the childhood incident, it became clear to him, after visiting several hospitals, that the infection was caused by buckshot. Although the cause of the disease has been confirmed, the lead bullet is located close to the transverse process of the cervical spine and surrounded by crucial blood vessels and nerves, posing a greater surgical risk. The patient has had a healthy past and denies any history of specific diseases, drug use, or food allergies. Relevant pre-surgery examinations were conducted, with the following indications: blood routine: leukocyte count of 11.8109\(\times\)10^9/L, neutrophil count of 9.59109\(\times\)10^9/L, and a neutrophil percentage of 81.2\%. Computed tomography (CT) scan of the neck revealed the following: metal nodules adjacent to the left transverse process at the C3/C4 level. Disc herniation at the C4/5, C5/6, and C6/7 levels. Development of bilateral submaxillary and cervical lymph nodes. Electrocardiogram and chest radiograph showed no apparent abnormalities. On January 31, 2022, after the doctors opened the cervical sheath to expose the common carotid arteriovenous vein and identified important vascular nerves such as the accessory nerves and cervical plexus, they began searching for the lead bullet. Despite being able to reach the transverse process of the cervical spine with their fingers, they could not locate the foreign body even after repeated attempts. Deputy Director Zhi-Hua Hu decided to employ a C-arm machine for precise positioning. Imaging indicated that the foreign body was merely a few millimeters away from the marker. Another surgical exploration led to the discovery of the lead shot in the head clamp muscle behind the cervical sheath, and the foreign body was successfully removed. Following the three-hour surgery, the 2 mm lead bullet, which had been concealed in the patient’s neck for 27 years, was finally extracted (Figure 1). After closing the surgical cavity, placing a drainage tube, providing

![Figure 1 The lead bullet hidden in the patient's neck for 27 years has been successfully removed.](https://www.tmrjournals.com/tcr)
symptomatic anti-infection treatment, and removing the neck drainage tube three days later, the patient’s vital signs stabilized, and he was successfully discharged on February 8, 2023. The patient experienced no significant discomfort and exhibited a positive recovery, as demonstrated in the post-operative interview.

Discussion

The anatomical complexity of the neck makes it prone to foreign body retention resulting from injuries such as explosions, car accidents, and bullet wounds [6, 7]. Among these causes, work accidents account for the highest proportion of foreign bodies in the neck, with metal being the main type of retained foreign body [8]. Currently, the common methods for locating foreign bodies in the neck involve multi-slice CT scanning and B-ultrasound localization [9].

In the presented case, the patient’s inability to accurately describe the size of the lead shot posed additional challenges during surgery. Despite the foreign body being located near the transverse process of the cervical spine, it could not be found upon opening the important anatomical structures of the neck due to its small size. Experienced surgeons are aware that the removal of foreign bodies, particularly small ones, presents a high surgical difficulty. Locating foreign bodies that have been concealed within vital anatomical structures for an extended period is even more challenging. Moreover, considering the 27-year history of this case, old foreign bodies are more prone to displacement. Additionally, as the patient’s foreign body resulted from a gunshot, the lead shot, being a metal foreign body, can potentially cause lead poisoning over time within the body. During the operation, the foreign body may also be displaced due to the operator’s squeezing and muscle manipulation.

To address these challenges, we repeatedly utilized the C-arm machine to accurately locate the foreign body during the operation, successfully identifying the lead bullet. Therefore, for deep-seated foreign bodies in proximity to important organs or cases where foreign bodies cannot be found at predetermined locations during surgery, it is crucial for clinicians to determine the precise location and surgical approach of the foreign body before the procedure, utilizing specialized instruments. This ensures the accurate removal of foreign bodies while minimizing damage to surrounding tissues [10].

Researchers have pointed out that image-guided navigation during surgery not only enables precise localization of foreign bodies but also reduces collateral damage to surrounding tissues during the search process [11]. In practical clinical applications, this innovative technology has narrowed the scope of the foreign body search and minimized harm to patients’ normal tissues [12]. It provides surgeons with direction in locating and effectively removing deep-seated foreign bodies that are less prone to displacement.

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