

Management of a Steel Wire Type Cervical Foreign Body Introduced by Penetrating Trauma: Case Report and Literature Review

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ABSTRACT

Foreign bodies in the ENT sphere are a frequent cause of emergency room consults. There are different introduction mechanisms. Foreign bodies with penetrating trauma are particularly serious, not only because of the difficulties often faced in managing them, but also because of the life-threatening risks of hemorrhage and asphyxia. These risks justify early management by specialized multidisciplinary team. The accessibility of complementary examinations and the evolution of their techniques have also led to a clear improvement in this type of treatment. Their occurrence in a context of violence may require psychiatric treatment. The prognosis depends mainly on the length and quality of treatment, but also on the damage caused by the introduction of these foreign bodies. We report on the management of a patient with psychiatric history, who consulted the emergency department of our ENT department, for the introduction of a cervical foreign body in the form of steel wires. A clinical and paraclinical examination was carried out, enabling anatomical orientation and evaluation of the patient's general condition. The patient underwent an exploratory cervicotomy to remove the cervical foreign body and perform a precise lesion assessment. The patient had a good follow-up with no post-operative complications.

Keywords: Foreign body; Cervical region; Surgery; Case Report

Introduction

Foreign bodies are a frequently encountered pathology in emergency ENT practice. They can be life-threatening by their type or location. It is a frequent event, especially in children¹. The nature of foreign bodies varies considerably. It essentially depends on the patient's age, eating habits and condition². All types of foreign bodies can be observed in psychotic subjects, especially those of a metallic nature. This medical-surgical emergency requires multidisciplinary management involving clinicians, radiologists and surgeons. With this in mind, we report the case of a patient with a psychiatric background who arrived at our department with multiple foreign bodies.

Case Presentation

We present the case of a 24-year-old woman, living in an orphanage, who was admitted in our ENT emergency department for sinking multiple steel wires into her neck. She had a history of mental disorder, vitiligo, and multiple hospitalizations for auto mutilation by inserting foreign bodies in the neck and the vaginal cavity for which she undergone cervicotomy under general anesthesia one year prior to this episode.

The clinical examination found a conscious patient, with a stable hemodynamic and respiratory state, without dysphonia or dysphagia. Upon her inspection, we noticed, additionally to

a cervicotomy scar, metallic foreign bodies sticking out of her neck with infected entry points and pus release.

A Nasofibroscope was performed showing no sign of laryngeal damage. A cervico-thoracic x-ray showed multiple wires above the thyroid cartilage, one supra-clavicular reaching the right hemithorax, and another one intra-thoracic (**Figure 1**). A cervico-thoracic CT-scan was done objectifying, in addition to multiple subcutaneous metallic foreign bodies (**Figure 2**), a metallic wire which has migrated in the supra clavicular area and reached the carotid region, between the internal carotid artery and the internal jugular vein and reaching the upper part of the thorax, measuring approximately 4cm (**Figure 3**).



Figure 1: Cervicothoracic x-ray-frontal view showing multiple cervicothoracic wires (arrow).

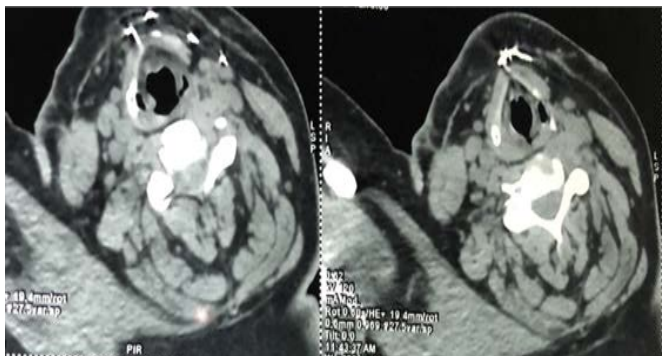


Figure 2: Cervical CT-scan - cross section showing subcutaneous steel wires in front of the thyroid cartilage.

The patient was admitted and hospitalized immediately. We started an intravenous prophylactic antibiotic treatment based on Amoxicillin – acid clavulanic with a Tetanus prophylaxis injections and painkillers before surgical treatment. The extraction of the foreign bodies was performed under general anesthesia and lasted 2 hours, by a team composed of ENT surgeons, vascular surgeons and anesthesiologists.

We started off by extracting the superficial wires then we proceeded with a Paul-Andre incision. The sternocleidomastoid muscle was dissected and retracted to expose the vascular axis of the neck. A stiff granuloma covering the foreign body was highlighted between the internal carotid artery and the internal jugular vein (**Figure 4**).

During the intervention, we noticed that the granuloma was attached to the internal jugular vein without any cleavage plane. We proceeded by incising the granuloma in an open book. The wire was extracted (**Figure 5**) with a Halstead clamp while the granuloma was not excised given the high risk of vascular injury. A careful hemostasis was assured. The postoperative follow up was good with a full recovery within 2 days. The patient was transferred after to psychiatric department. No complication was noted after one month follow up.

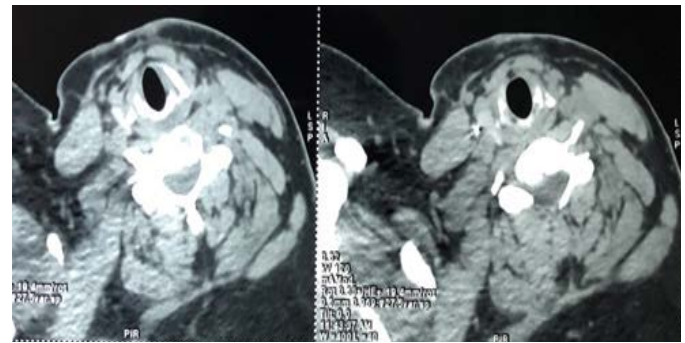


Figure 3: Cervical CT-scan – cross section showing cervico-thoracic steel wires embedded between the internal carotid artery and the internal jugular vein.

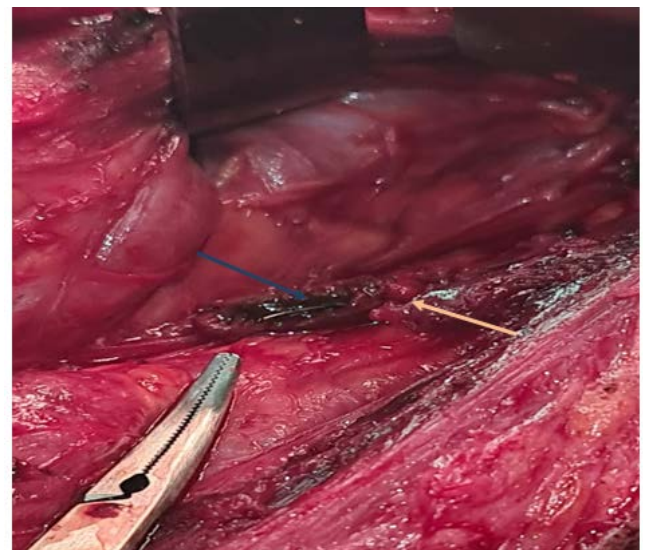


Figure 4: A steel wire (blue arrow) surrounded by a granuloma (green arrows) between the internal carotid artery and the internal jugular vein.



Figure 5: Steel wire removed from the granuloma, the other one was subcutaneous and easily removed.

Discussion

Generally considered, cervical and upper aero digestive tract foreign bodies are most common in children under 6 years of age, with a peak in the 1-4 age group. Boys are the most frequently affected because of their vivacious³. Among adults, foreign body injuries often occur in special circumstances: toothless elderly subjects, patients with psychotic disorders or prisoners who are at increased risk of ingesting foreign bodies. A century ago, mortality linked to the ingestion of foreign bodies was 57%. These results can be explained by the improvement of surgery and endoscopic extraction techniques⁴.

Apart from underlying psychiatric disorders, diagnosis is usually straightforward in adults, based on questioning. The situation is more difficult in children, given that questioning is informative in only 5% of cases⁵. Voluntary administration of foreign bodies is usually seen in prisons, among psychiatric patients or as part of a suicide attempt. It usually involves multiple foreign bodies administered at the same time or in close succession⁶.

The most common ENT functional signs are localized pain, odynophagia, dysphagia, dyspnea and hyper-sialorrhea. However, these patients may be asymptomatic⁷. In all cases of suspected CE ingestion, a full radiological work-up is essential. Standard X-rays are the usual diagnostic investigation. Systematically, patients should be given chest x-rays from the front, neck x-rays from the front and in profile, with inspiration and the head slightly hyper flexed to clear the inter-tracheo-vertebral space, and unprepared abdominal x-rays from the front in the standing position. In addition, CT scans provides greater precision in determining the exact location of a foreign body⁸.

The neck includes all the anatomical structures between the base of the skull and the clavicles. Dealing with penetrating cervical foreign bodies is based on the systematization of the neck into three anatomical zones according to the foreign body's entry orifice. Zone I is delimited by the clavicle and the sternal fork at the bottom, and by the lower edge of the cricoid at the top. Zone II lies between the lower edge of the cricoid and the mandibular angle. Zone III extends from the mandibular angle to the base of the skull⁹.

For stable patients, zone II offers the advantage of easier anatomical access and the possibility of surgical exploration via cervicotomy. Zones I and III encouraged the use of radiological methods of exploration, given their narrowness and difficult surgical access. The lateral compartment is the site of vascular lesions, and wounds in this compartment more often require surgical exploration. Damage to the central compartment is responsible for lesions of the upper aerodigestive tract requiring initial orotracheal intubation, with initial monitoring in intensive care and possible delayed surgical management¹⁰.

Specific medical treatments include antibiotic prophylaxis and psychiatric care. The aim of early prophylactic antibiotics is to prevent bacterial growth in heavily contaminated tissues. Thus, avoids gas gangrene caused by anaerobes, especially Clostridium, but also infection caused by group A beta-hemolytic streptococci and infections caused by other Gram-positive bacteria, particularly Staphylococcus aureus. Prophylaxis with amoxicillin and clavulanic acid (2 g direct intravenous, 3 times a day) is recommended. American guidelines recommend cefazolin, with a similar spectrum of action. In case of allergy, prophylaxis with clindamycin is indicated (600 mg intravenous infusion, 4 times a day)^{11,12}.

The main risk in these cases is respiratory distress and hemorrhage. The signs of severity of these cases are therefore dominated by signs of hypoxemia, which determine the immediate prognosis, leading to cardiorespiratory failure in the absence of appropriate treatment, and signs of hemorrhagic shock. The therapeutic surgical approach to be considered generally if early management is chosen is extraction of foreign bodies, followed by local care (cleaning, washing), and immediate skin closure with suction drains¹³.

Conclusion

The management of this type of cervical foreign body by penetrating trauma is multidisciplinary. It consists after ensuring control of any eventual hemorrhage and lesion of airways, of performing a radiological injury assessment to prioritize the damage and guide surgical management.

Psychiatric care is essential in these cases.

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