

Management of a Piece of Glass Cervical Foreign Body Introduced by Penetrating Trauma: Case Report and Literature Review

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ABSTRACT

Cervical penetrating trauma is particularly dangerous, as this area is the habitat of several anatomical elements whose lesion can be functionally and vitally life-threatening. In a patient whose vital functions are stable, a cervical CT scan can provide a complete lesion assessment, highlighting any foreign bodies that may have gone unnoticed, and guiding any surgical exploration.

In this context, we report the case of a man who had a neck trauma in a road traffic accident, with inclusion of a foreign body which was revealed at prevertebral level by cervical CT scan. Surgical exploration was performed to remove the foreign body and explore all the anatomical structures in the region. The evolution was excellent.

Keywords: Case Report; Cervical Trauma; Foreign bodies; Surgery

Introduction

Cervical trauma is a potentially serious injury, characterized by the difficulty of its initial management in the emergency setting, especially by sharp objects causing open trauma and leaving foreign bodies behind, with all their lytic, infectious and hemorrhagic complications. These injuries are always unpredictable and multifocal¹.

Mortality has been reported at between 2% and 10%. The severity and particularity of these lesions call for rapid, precise clinical analysis, in a context of extreme urgency, using clinical, radiological and endoscopic methods. These means have undergone considerable technological progress in recent years². This has radically changed management methods, avoiding unnecessary surgical exploration³. In this context,

we report the case of a patient who consulted our department's emergency department for a penetrating glass wound. The patient underwent a clinical and radiological evaluation prior to surgical exploration.

Case Report

This is a study of a 50-year-old patient operated on for a cervical wound, with penetration of a glass-like cervical foreign body in our ENT and cervico-facial surgery department. The patient was referred by another hospital.

The patient had no underlying pathology. The trauma occurred 3 hours prior to consultation in our department.

On general physical examination, the patient was in good general condition, conscious 15/15 Glasgow score, and hemodynamically and respiratory stable. On ENT examination, a paramedian cervical wound measuring approximately 5cm was noted, which had been sutured at a peripheral hospital to which the patient had first been referred (**Figure 1**). The rest of the ENT examination, and there were no other objective signs of trauma of other systems.



Figure 1: Paramedian cervical wound, which had been sutured.

A cervical CT scan with injection of contrast product was then carried out to assess the lesion and guide the treatment. It revealed the presence of a prevertebral foreign body, but miraculously all the vascular, digestive and aerial anatomical structures were intact (**Figure 2**).



Figure 2: CT scan showing the presence of a prevertebral foreign body.

We started a prophylactic antibiotic treatment with amoxicillin and clavulanic acid. Given the CT scan data. An indication for exploratory cervicotomy was made. On preoperative examination, no vascular, laryngo-tracheal or esophageal lesions were found. In addition, the sternocleidomastoid muscle was injured. After meticulous dissection using Halstead forceps, the prevertebral foreign body was found to be a piece of glass (**Figure 3**). Next, hemostasis is ensured and suction drains are placed and closure plan by plan.



Figure 3: Image showing glass-like cervical prevertebral foreign body.

The suction drain was removed the following day. The evolution was good, no hematoma or other signs of lesions of the cervical anatomical structures were noted.

Discussion

Neck penetrating wounds are notoriously difficult to assess owing to the fact that they involve a technically complex region where several vital structures are located in a limited space. There is still controversy about the systematic application of specialized diagnostic tests, including invasive ones, to stable, asymptomatic patients¹.

Non-operative management has gained in popularity in recent years, especially with advances in imaging⁴. Cervical region anatomy is distinguished by a number of vital vascular, neurological, respiratory and digestive structures enclosed by thick, poorly extensible fasciae. Penetrating trauma may cause a number of arterial lesions, including arterial transections, AV fistulas, pseudoaneurysms and voluminous hematomas. But also laryngeal, tracheal and esophageal lesions⁵.

Alongside the skin, blood vessels are the anatomical structures most frequently injured, since approximately 25% of penetrating neck traumas result a vascular lesion. Associated or not with airway obstruction, cranial nerve damage, and cerebral ischemia due to arterial transection or occlusion⁶.

Physical examination is the basis of medical management. The observation of “strong” clinical signs associated of hemorrhagic shock requires immediate admission to the operating room. There is no proven added value to CT imaging prior to hemostasis in the OR. Active bleeders must be placed in Trendelenburg position to reduce the risk of gas embolism⁷.

Missed pharyngoesophageal lesions are among the most feared pitfalls in cases of penetrating cervical trauma, because the clinical signs are not always obvious and their treatment is delayed, which can be life-threatening. Successful conservative management of small esophageal lesions has been reported by some authors. Signs of a laryngotracheal lesion include acute respiratory distress, the presence of air bubbles externalized from the cervical wound, and the occurrence of significant hemoptysis⁴⁻⁹.

The neck is systematized in three compartments (two lateral and one central). Lateral compartment wounds more often require surgical exploration. Injuries to the central compartment are responsible for lesions of the upper aerodigestive tract requiring initial orotracheal intubation with possible deferred surgical management⁸.

Advances in CT imaging have led to a radical change in the management of these types of traumas. With the exception of uncontrollable hemorrhagic shock, CT scans must be performed systematically on all stable patients. Its sensitivity is 100%, its positive predictive value 100% and its negative predictive value 98%. It gives information on the integrity of vascular, air, digestive and bone structures. Precise arterial and venous injection times are essential for optimal visibility of the neck's vessels¹⁰.

Medical treatments include selective arteriographic embolization, antibiotic therapy and psychiatric care.

Early administration of antibiotics reduces the rate of infection. The aim of antibiotic prophylaxis is to prevent gas gangrene due to anaerobes, particularly *Clostridium*, also infection due to group A beta-hemolytic streptococci and infections due to other Gram-positive bacteria. Antibiotic prophylaxis is usually based on amoxicillin and clavulanic acid (2 g intravenously, 3 times a day). American guidelines recommend cefazolin, with a similar spectrum of action^{11,12}.

Psychiatric care is essential for suicide attempts. Tracheotomy is the reference technique for maintaining a free airway, it has the advantage of not aggravating a laryngeal lesion¹³. Vascular repair is preferable to simple carotid ligation of the internal and primitive carotid arteries, which has a poorer vital and functional prognosis. Ligation of the external carotid artery by cervicotomy is indicated if bleeding cannot be controlled. Similarly, a venous lesion is treated by simple ligation of the vessel concerned¹⁴.

After ensuring that the airway is unobstructed and hemostasis has been controlled, an assessment of the injury can be made. Suitable trimming must be the rule in order to avoid the risk of infection, and skin closure may be deferred. Any foreign body extraction must be carried out with immediate cutaneous closure on suction drains if the wound is sterile¹⁵.

Conclusion

Surgical management of these patients is the responsibility of specialized multidisciplinary teams. Every open neck trauma is potentially life-threatening, and requires rapid assessment and detection of critical injuries, as well as urgent surgical intervention if necessary.

Stable patients are being managed less interventionistically, based on clinical examination and imaging. When necessary, it is best to carry out surgical exploration within the first 24 hours, in order to limit the risk of infection and late sequelae.

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