



Penetrating Foreign Bodies in Head and Neck Trauma: A Surgical Challenge: a case report

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Abstract:

Penetrating foreign bodies of different origins in the head and neck are rare and potentially dangerous injuries, which might pose problems for their detection, primary care, and final treatment. Depending on the severity of the underlying trauma, some injuries present a higher risk for the presence of foreign bodies. Minor wounds, including common lacerations, are likely to be contaminated. Despite improving medical imaging techniques, detection remains a challenge as it is dependent on the material of the foreign body, the affected anatomical site, and the injury severity. Therefore, a detailed history of the circumstances leading to trauma is essential when foreign objects are not visible during a clinical examination. Precise detection of the foreign body, its anatomical position, and the affected surrounding structures are vital, especially for impalement injuries of the head and neck area. Therefore, an interdisciplinary planning approach is essential before the removal of the foreign object. Finally, tension-free anatomical adaptation of the corresponding structures is crucial for maintaining and restoring aesthetic and function. Here, we report a case of a young man victim of a projection of a metal nail through the thyrotracheal area.

Keywords: foreign body, tracheal, head and neck surgery.

Introduction:

Injuries associated with foreign bodies in the head and neck area can occur at all stages of life and show a heterogeneous etiology. The severity and risk for foreign bodies differ between injuries, and dependents on the underlying trauma. In addition to a detailed medical history, thorough clinical examination and radiological assessment are crucial for the successful detection of clinically unapparent foreign bodies. In some cases, the foreign body might be visible without further diagnostics, however, in many cases, the foreign body is not clinically apparent. For this reason, even though it is not visible upon initial evaluation, the surgeon needs to be aware of the potential risk of the existence of foreign bodies.

However, more severe traumatic injuries, including occupational and domestic accidents, assaults, and suicide attempts, represent a major cause for the occurrence of penetrating foreign bodies. The early wound exploration and proper wound debridement with proper antimicrobial coverage are the prime factors in curtailing morbidity and mortality. Irrespective of these problems, the overall mortality is relatively low, ranging from 0 to 11%.

The following case exposes the diagnostic and treatment of a foreign body of the neck area.

Case report:

A 41-year-old carpenter got injured by a projected nail, while manipulating a block of wood, crossing the anterior region of the neck. the patient was not sure whether the foreign nail got stuck in his neck, even more that there was no sign of scratch on his neck, at the emergency, There was no excessive bleeding, dysphonia nor respiratory distress. the cervical exam found a small red point of entrance, associated to a subcutaneous emphysema [Figure 1]. No other swelling was revealed in other part on the neck nor a stridor and respiratory distress. The pulsation of the carotid was intact bilaterally. The remaining ENT and systemic examinations were within the normal limit.



Figure1: cervical exam found a small red point of entrance, associated to a subcutaneous emphysema

Immediately, CT scan of the head and neck region were performed, which revealed [Figure 2]: presence of a foreign body of metallic density penetrating the anterior cervical region at the level of C6, having a course in height and in back and in interior, crossing the thyroid and arriving at the posterior wall of the trachea. presence of subcutaneous emphysema in the deep spaces of the face and neck, extending to the anterior mediastinum, No fracture in related bones and cartilages was revealed by the CT scan. There was no evidence of vascular injury and hematoma formation.

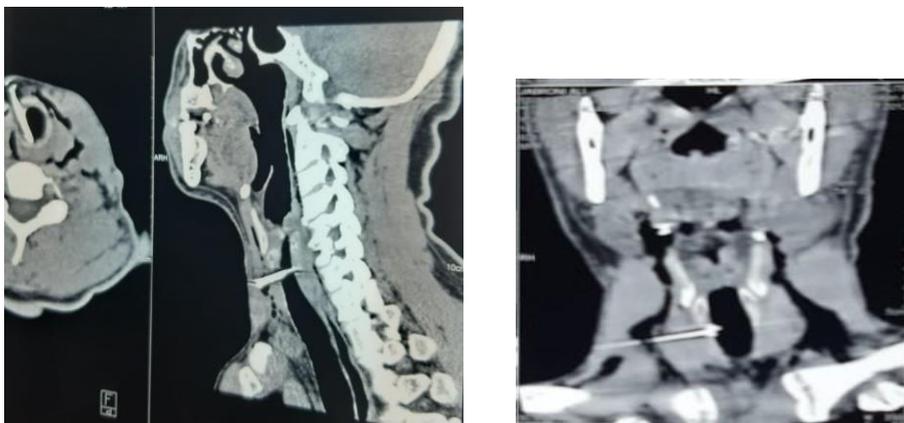
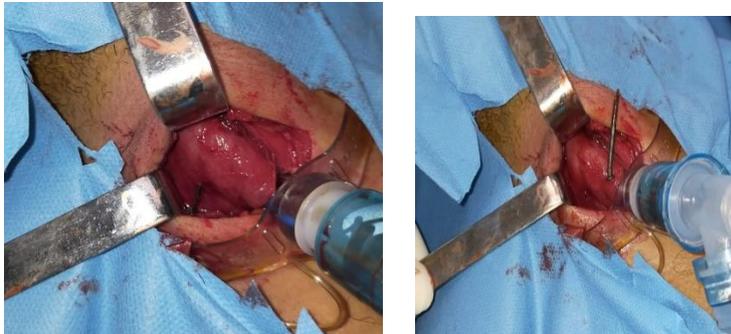


Figure2-3: CT scan of the head and neck showing the foreign mettalic body penetrating the anterior cervical region.

In the operation room and under general anesthesia, we proceeded to a first tracheostomy, then through the same incision the wound was explored and the foreign nail was completely extracted. The foreign body did not damage any major structures, including the major blood vessels, and the recurrent nerve. (Figures 4-5)

Intravenous antibiotics, anti-analgesic and prophylaxis of tetanus were given in appropriate doses.

Three days postoperative, we started the tracheostomy sevrage and the patient was discharged on the seventh day after decanulation. The follow-up revealed a complete healing of the wound.



Figures 4-5: per-op image after tracheostomy and cervical exploration showing the metallic nail through the thyroid gland.

Discussion:

Penetrating injuries to the neck are associated with high morbidity and mortality rates owing to the multiple vital structures present within this anatomic region. Foreign body in the neck would damage vital structures such as major blood vessels, the aerodigestive tract and the thyroid gland.[1,7] However, the course of stab wounds is more limited than that of gunshot wounds and there is still a clear potential for major injury. The depth and nature of the injury are highly determined by the kinetic energy delivered by object itself or by the subject.[1,2]. Some artisanal jobs and activities are more dangerous than others exposing them to several injuries by projected materials or incidence while manipulating which is the case of our patient. [1,3]

The metallic foreign bodies are dirty and infectious because the porous organic material provides good culture conditions for gram positive and gram negative bacteria, which may cause abscess formation. Apparently, even clean metal may cause a foreign body reaction. Any infection in the neck is severe for the patient.[2,8].

Penetrating trauma in the proximity to the course of major arteries may result in vascular injury. The vascular injuries are easily detected when hard signs, such as absent pulses, arterial bleeding, expanding hematomas, vascular thrills, bruit or frank ischemic changes, are present. In the present case, the hard signs as well as the soft signs were not observed during a detailed examination. Thus, we selected to perform a CT scan rather than to go in for an angiography.

Although a significant number of studies recommended the CT scan as the investigation of choice for the stable case of penetrating neck injury, other investigations only enlighten the clinician about the few facts of injury. The CT scan, however, provides extra information about the integrality of the aerodigestive tract, the neurovascular structures and the vertebral integrality as well as the course, tract and position of the foreign body in the neck.[1-5] As revealed in the present case, it provided an evaluation of the depth and amount of tissue injuries, recognizing a metallic density structure penetrating the anterior cervical region at the level of C6, having a course in height and in back and in interior, crossing the thyroid and arriving at the posterior wall of the trachea, associated to a subcutaneous emphysema in the deep spaces of the face and neck, extending to the anterior mediastinum

Different treatment protocols are envisaged, selective exploration and adjunctive invasive or non-invasive assessment seems to be the best approach.[1,2,7] The patient may present in shock due to excessive bleeding or may present with respiratory distress. In such a case, the airway should be maintained by performing tracheostomy and shock should be managed with priority. All veins and external carotid artery injuries in the neck can be safely ligated to control hemorrhage. Internal jugular vein repair is mandated. Laryngeal and tracheal mucosal lacerations from the penetrating injury should be repaired early (within 24 h). Significant laryngotracheal-displaced cartilage fractures need surgical approximation.[1,3,7] In our case, we selected the option of immediate exploration of the neck, because the injuries on the thyrotracheal course (through muscles and the thyroid gland then the trachea)

as well as the emphysema could increase easily. We proceeded then to a first tracheotomy then exploring and debridement. Intravenous antibiotics, anti analgesic and prophylaxis of tetanus were given in appropriate doses.

Postoperative monitoring include nasofibrosopic explorations ensuring the integrity and mobility of the glottic floor and vocal cords, and then initiate the tracheotomy sevrage and decannulation.

Conclusion:

Penetrating foreign body in the neck is an uncommon but potentially life-threatening and crisis condition. Diversities in the management protocol with a changing technique compel the clinician to perform a close evaluation of the patient. Each maneuver should be directed to minimize mortality and morbidity. In cases of mettalic foreign bodies, early exploration and removal reduces the chances of infection, resulting in a favorable outcome.

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