



Clinical Case

Unusual Outcome of Non-Ballistic, Penetrating Head and Neck Injuries with Retained, Metallic Foreign Body: A Report of Two Cases

Issue inhabituelle de plaies pénétrantes cervico-faciales, non balistiques, avec corps étranger métallique enclavé: à propos de deux cas

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ABSTRACT

Retained foreign bodies of head and neck after penetrating injuries are uncommon and rarely reported. They are more frequent in military than civilian practice. They are potentially life threatening due to vascular and nervous damages they can cause. The authors report two cases of penetrating injuries with retained metallic foreign bodies which involved the neck and the maxillofacial areas. These harmful objects exceptionally missed the vital organs. Proper clinical examination, radiological and medical imaging and surgical management are discussed in order to prevent complications.

RÉSUMÉ

Les corps étrangers enclavés après une plaie pénétrante de la tête et du cou sont rares. Ils sont plus fréquemment rapportés en pratique militaire que civile. Ils peuvent engager le pronostic vital en raison de la richesse en éléments vasculo-nerveux présents dans ces régions. Les auteurs rapportent deux cas de plaies pénétrantes du cou et de la région maxillo-faciale par des objets métalliques, qui sont restés enclavés. Aucun organe vital n'avait été lésé dans ces cas. Un examen clinique approprié, une imagerie radiologique et médicale et une prise en charge chirurgicale sont discutés afin de prévenir les complications.

INTRODUCTION

Penetrating wounds in the neck and maxillofacial areas are uncommon. Those with retained large size foreign bodies are rarely reported [1]. Such injuries can damage vital structures like great vessels, nerves, pharynx, esophagus and orbital content. The retained foreign body therefore becomes life-threatening [2]. In addition to possible facial bone fractures, important structures, including the facial nerve, parotid gland and parotid duct, may be affected. The orbital region is noted to be particularly vulnerable to injury and may result in more serious complications, including impairment of ocular mobility, disturbances in vision or even complete loss of vision [3].

They are rarely reported in the civilian practice. The non ballistic injuries are usually caused by a foreign object with a low impact velocity. Most occur accidentally as a result of violence, falls, work-related accidents, car accidents, suicide, and psychotic disorders [2, 4].

Management and prognosis depend on the nature and location of the object and whether there is secondary migration or infection [5]. We present two cases and discuss the accurate diagnosis and appropriate surgical treatment to prevent complications due to these retained foreign bodies.

CASE 1

A 19-year-old male presented to the ENT department four days after being involved in an altercation where he reports he was attempting to break up a fight. He complained of mild left cervical pain. He denied any loss of consciousness or massive bleeding prior to this. On physical examination, the patient was found to have stable hemodynamic status. A huge iron arrow was impacted on the left side of his neck in the sternocleidomastoid muscle. The direction was anterior and oblique. The entering point was found in the post auricular region, no exiting point was found. There was no saliva and no air coming from the entry point. There was no weakness of the shoulder, nor any respiratory disorders (Figure 1a).

Plain xray was performed. It revealed a retained metallic foreign body within the left sternocleidomastoid muscle (Figures 1b).

The decision was made to remove the retained iron arrow under general anesthesia. A work up, made of blood count, blood group and haemostatic tests was performed. The anesthetic staff did not notice any contraindication for the surgery. A general anesthesia was given with an orotracheal intubation. Cautions were observed not to over extend the head during this intubation.

We infiltrate the site with Lidocaine and Adrenaline 2%. A 15 centimeter incision was performed according to the foreign body direction. The underlying muscle was divided and the iron arrow visualized (Figure 1c). The deep vessels were not reached. 18 centimeters of the

impacted part of the iron arrow was removed from the neck. The wound was appropriately washed with saline. The closure was done under appropriate drainage. At four weeks post-operatively, the patient was fine.

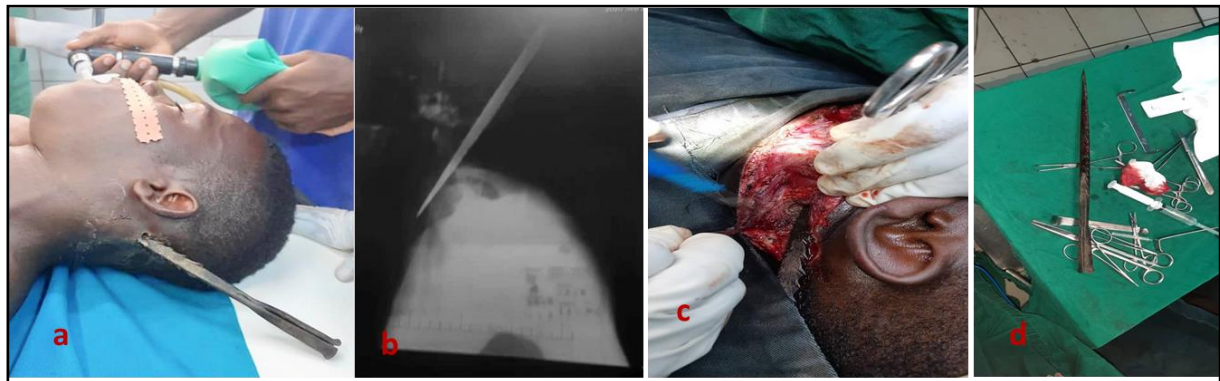


Figure 1 : Pre and peroperative photographs and standard radiological imaging. Preoperative photograph shows an iron arrow penetrating the left side of the neck (a). A standard radiological imaging shows the trajectory of the impacted foreign body within the sternocleidomastoid muscle (b). Preoperative photograph shows the iron arrow in situ before removal (c). Peroperative photograph of the removed iron arrow (e).

CASE 2

A 21 year old man fell from a tree in a construction site and an iron bar impaled in his head as he landed. On arrival at our ENT department, he chiefly reported facial pain, headache, and nasal bleeding. On physical examination, an iron bar was found to have penetrated from the right orbit to the left cheek area (Figure 1a). The patient was neurologically intact. The right eyebrow was slightly swollen. The eye was intact with no ophthalmoplegia. A computed tomography (CT) scan of the head with skull reconstruction showed that the iron bar penetrated into the anterior part of the internal wall of the orbit, traversed the nasal cavity, enter the left maxillary sinus by breaking his inferomedial wall right and terminate out of the left cheek area (Figure 2b). The patient was taken

urgently to the operating room to have the iron bar removed. The intubation was orotracheal. The iron bar was firstly cut shorter with a saw (Figure 2c). A left paralateral incision, extended to the suborbital and cheek areas was made. A maxillary antrotomy was performed allowing for adequate exposure of the foreign body (Figure 2d). The iron bar was then removed under direct visualization with help of an endoscope to view the nasal cavity (Figure 2e). The damaged tissues were repaired by sutures. The nasal septum perforation was closed by a conchal cartilage harvested from the left ear. The nose was packed with haemostatic sponge for two days. The association Amoxicillin-Clavulanate Acid was used for 2 weeks to prevent posttraumatic infection. At follow-up visits for 3 weeks after surgery, he was out of danger.

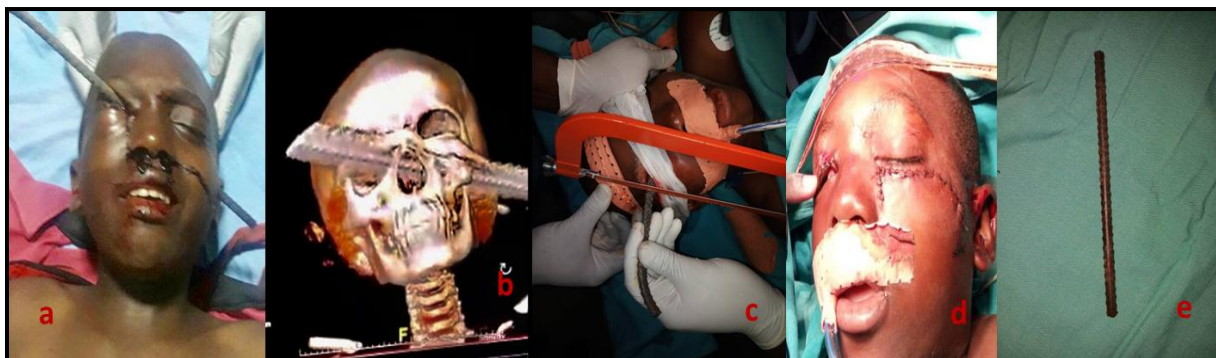


Figure 2 : Pre and peroperative photographs and computed tomography imaging. Preoperative photograph shows a visible penetrating injury by an iron bar from the right orbit to the left cheek (a). A three-dimensional computed tomography scan shows the trajectory of the steel bar, running through the right internal orbit wall, the nasal cavity and the left maxillary sinus (b). Preoperative photograph shows the saw that was used to cut the steel bar shorter (c). Per operative photograph after removal (d). Peroperative photograph of the removed steel bar (e)

DISCUSSION

The neck is a complex region containing a number of vital structures. Objects penetrating through the neck could damage any of these structures. Moreover, the injury in the zone III (area above the level of angle of mandible) is more dangerous than injury in the zone II (the area between the cricoid cartilage and angle of the mandible) because of proximity of skull base to zone III [6]. However the nature, the shape the direction of penetration and the velocity must be taken in account when evaluating such a patient. In the first case, the injury was located to the zone II. The direction of the iron arrow was lateral and superficial but fortunately, the major vessels and nerves were not injured. Penetrating neck wounds are potentially dangerous and require emergency management. This must be considered more seriously with large impacted iron foreign bodies which can accidentally migrate inside the wound and cause secondary damages [6].

Angiography is required for evaluation of the vital vessels and relationship between foreign bodies and vessels [6]. But it is not necessary in the absence of vascular sign [7]. Our first case had no physical signs of major vessels injury; we did a plain x ray for evaluation of the trajectory of the foreign body. Sometimes foreign bodies might tamponaded major vessels injury; therefore, blind removal may cause life threatening hemorrhage. Such foreign bodies should always be removed by exploration in a proper setup. The difficulty of exploration of the neck varies. Zone III is the most difficult as it is hidden by the ramus of the mandible and also carries the risk of injuring the facial nerve [8]. Our first reported case, the exploration was easy to perform, since it was done on the zone II. The clinical examination of patients with an impacted object in the face should be carried out in a systematic fashion. Active wound bleeding, increasing hematoma, a low level of hemoglobin and signs of hypovolemic shock upon admission are indications of an associated vascular injury [9]. In our second case the hemodynamic state was stable and there was no active bleeding. Most eye injuries involving the penetration of a foreign body exhibit minimal surface damage, which may often be undervalued during the initial evaluation. Orbital fat tends to conceal the trajectory, making it difficult to identify a point of entry. Thus, suspicion is crucial to defining the diagnosis. Ocular acuity and mobility should be investigated, as penetrating wounds in the orbit are frequently associated with severe ocular trauma [10]. In our second reported case, there was no doubt because of the large size of the penetrating object. Only the medial wall of the orbit was injured, fortunately missing the eye and tears apparatus. Plain radiography is usually the first additional exam to be requested due to its low cost and easy access. This imaging exam may be useful in identifying and locating intraorbital foreign bodies [11]. For our second case we obtained a CT with reconstruction to precise the trajectory of the iron bar. Considering the large size of the retained foreign body, the use of a pneumatic cutter is mandatory to avoid

micro-vibrations that can worsen any latent organic lesion [11]. We did not have one in our arsenal. We performed, successfully and fortunately, the reducing of the iron bar with a saw. The purpose of postoperative corticosteroid therapy and antibiotics was to reduce edema and the risk of postoperative infection. Surveillance during the 72 hours was essential to detect the first signs of infection and particularly tetanus, which is highly feared in our environment

CONCLUSION

Penetrating foreign bodies in the neck and maxillofacial region is uncommon but potentially life threatening. As others, the metallic ones need early exploration and removal to reduce the chances of infectious complications and secondary damages. The clinician must perform a close evaluation of the patient. Each maneuver should minimize mortality and morbidity by means of timely intervention.

DECLARATION OF INTERESTS

The authors declare that they have no conflicts of interest in relation to this article.

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