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Case Report

The extraordinary case of a welder: retrieval of foreign bodies via transcervical neck exploration

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ABSTRACT

Penetrating foreign bodies in the neck can be challenging to locate, especially given the complex anatomy of neck and edematous tissue planes following injury. These foreign entities require prompt surgical exploration for their removal because of risk of migration. Retrieval of foreign bodies relies upon their size and surrounding anatomical tissues. We are reporting an uncommon instance in which an iron chip accidentally penetrated patient's neck, producing acute hoarseness of voice and agony. The foreign body was removed via transcervical neck exploration.

Keywords: Neck injury, Transcervical neck exploration, Laceration wound

INTRODUCTION

Penetrating injuries to the head and neck region with various items have been described in the literature since time immemorial.[1] These injuries can occur at any age and from a variety of causes. Most of these injuries occurred by interpersonal violence, building site mishaps, road traffic accidents, neglect toward children by their caregivers, or bomb blasts.[2] The severity of injury and risks associated with them also vary with the type of injury and the type of foreign body as head and neck area is home to many vital structures. Penetrating foreign body injuries in head and neck are potentially dangerous as they might present a challenge in their detection, primary care, and final treatment. Following an accident, the usual anatomy may be altered due to edema and tissue loss, making identification and retrieval even more challenging.[3] Further, it become more important where in impacted body is made up of materials having varying radio-sensitivity. Therefore, a detailed history of the circumstances leading to trauma is essential. Radiological investigations to locate material in body are of extremely useful in cases where foreign objects are not visible directly during clinical examination. A accurate detection and anatomical position of foreign bodies along with affected surrounding structures is also important. Therefore, an interdisciplinary approach and planning is essential before attempting to removal of such a foreign object. Also, it is crucial to maintain anatomy of corresponding structures in order to restore the aesthetics and functions of head and neck.

CASE REPORT

A 45-year-old male presented to emergency department after meeting with an accident while he was at work. He got injured by an iron chip in the neck region at around 4 pm in the evening. The patient, a welder by occupation, was hammering an iron sheet that shattered on impact, followed by a penetration injury on left side of neck (Figure 1).

There was an immediate onset of hoarseness of voice and pain in neck that aggravated with neck movements. However, the patient had no complaints of difficulty in swallowing, no complaints of difficulty in breathing or stridor. Patient was anxious, yet cooperative, well oriented and hemodynamically stable. Local examination revealed a small laceration (of 0.5×1 cm) located in the left anterior part of neck, 4-5 cm from midline, accompanied by slight odema and induration around the entry point. Indirect laryngoscopy showed paralysis of left true vocal cord with rest of the endolarynx within normal limits.

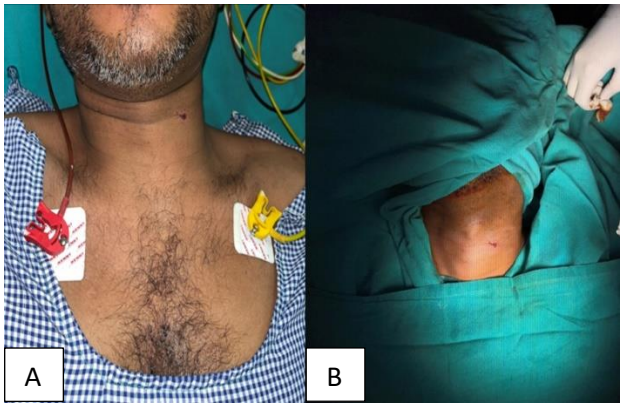

Figure 1 (A and B): Photographs of small laceration wound located in the left anterior part of neck.

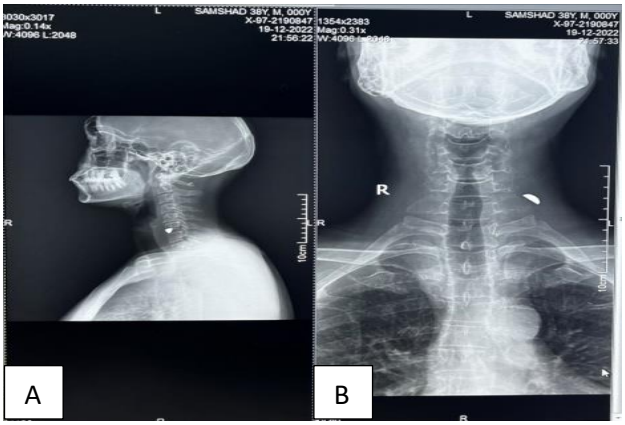

Figure 2: (A) X-ray neck AP and (B) lateral view showing a radio-opaque object in lateral part of neck.

X-ray confirmed a 2×1 cm rectangular radio-opaque shadow embedded in lateral aspect of neck (Figure 2). A non-contrast CT scan of the neck (Figure 3) was done to know the exact location of foreign body with respect to vital structures that revealed a hyper-intense shadow of about 2×1 cm size embedded in Scalene muscle, 35.2 mm lateral to cervical vertebra and 38.2 mm posterior to anterior border of neck. However, the foreign body was not found to breach any vital structures in the neck with no evidence of any collection surrounding the foreign body.

Therefore, the patient was planned for neck exploration under GA to remove the foreign body (Figure 4). A trans-cervical skin incision was given in the left antero-lateral part of neck. Skin, subcutaneous tissue and sub-platysmal flaps were elevated and dissection continued. Left Sternocleidomastoid muscle (SCM) and strap muscles were identified.

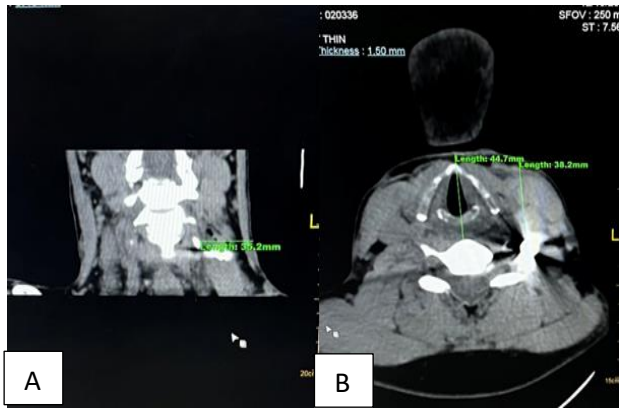

Figure 3 (A and B): Non-contrast CT scan of the neck to know the exact location of foreign body with respect to vital structures.

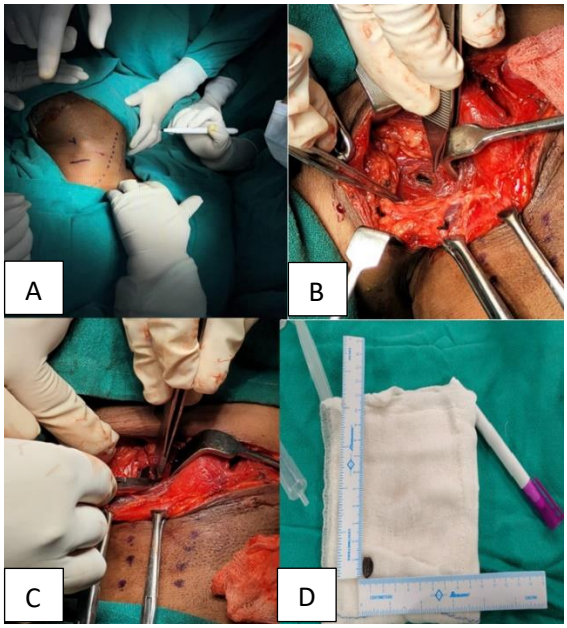

Figure 4: Photographs of (A) trans-cevical incision, (B and C) foreign body embedded in scalene muscle and (D) foreign body (iron chip) of size 0.5×1 cm.

Medial border of SCM was dissected to create a plane followed by lifting up of SCM muscle. Further dissection was continued with digital palpation as a guide to the location of foreign body. The foreign body was found to be imbedded in the Scalene muscle in left posterior triangle of neck. It was carefully removed (Figure 4). No major neurovascular bundle was found to be damaged. Hemostasis was achieved. Drain was placed in situ followed by wound closure in two layers. Antiseptic

pressure dressing was done. Patient maintained stable vitals in the immediate post-operative period while he was managed with IV antibiotics, analgesics and IV steroids and the voice improved within 4-5 days. Patient was further followed up till a period of 4 months when the wound site was found to be healthy and voice normal.

DISCUSSION

Though soft tissue injuries to the head and neck are very common, but penetrating injuries resulting in the impaction of foreign bodies in the neck are rare. They usually occur secondary to a gunshot, stab wound, accidental fall or a high velocity impact leading to penetration of foreign body in the neck. The diagnosis of a penetrating neck trauma with associated foreign body in-situ is generally quite obvious from history and clinical examination. Plain radiographs are essential at the initial assessment. However, identifying the exact location of foreign body on CT scan can be very challenging at times, especially in cases where the impacted body is very thin or where foreign body is not very clear on CT imaging (Figure 3). Precise localization of the foreign body is essential for its complication free removal. If a delay is suspected between the injury and surgical exploration, repeat films immediately prior to surgery are mandatory, to assess any further migration in the interim period.[4] Here both CT and MRI are useful tools, not only for the localization but also for the determination of the relation between the foreign body and the major neurovascular bundles of neck.[5] However, CT scans are not without their drawbacks. The soft tissues of neck are mobile as compared to bony and cartilaginous structures. Thus, at the time of surgery, the foreign body may not be situated exactly as where it is seen in the CT.[6] However in our case, due to impaction, the foreign body was found at exactly the same place as was seen on CT scan.

Incidences of recurrent laryngeal nerve (RLN) palsy in cases of neck trauma due to penetrating foreign body are attributable to causes like direct injury from foreign body or iatrogenic injury from instrumentation or thermal injury from electrocautery. Minor injuries are usually transient in nature where a full recovery can be expected within a week. Trans-section of RLN by impact from foreign body can lead to a permanent palsy resulting in a permanent change in voice. There are currently two advocates for the management of a penetrating cervical trauma mandatory exploration and exploration in selected cases.[7,8] The mandatory exploration for all cases favours removal of foreign body at the earliest as these cervical foreign bodies are known to migrate[9] and can cause secondary complications such as hemorrhage or hematoma, infection and neurovascular compromise. It has been observed from the literature reports that penetrating neck wounds are still present a serious challenge in diagnosis and management of the injury.[10] CT scan has been found useful technique to locate the metallic foreign body penetrated in neck which has been removed surgically.[11] Silver and coworkers[12] have revealed that developing knowledge of neck anatomy is critical for otolaryngologists. Further, 3-D stereoscopic imaging techniques may be useful for understanding the anatomic associations of critical neck structures. Overall, the present case study will offer an important addition to the pre-existing literature.

Preventing accidents & injuries at a construction site

Construction sites are high risk occupations. The hardworking workers do essential and valuable work to benefit our economy. The number of constructions related accidents and fatalities are ever increasing. The occupational safety and Health Administration (OSHA) reports four most common causes for fatalities in construction industry: Falls (usually from heights), electrocutions, struck by an object, caught in (or in between) machinery. Tips for preventing construction site injuries and fatalities are as follows: provide safety training, plan ahead and manage hazard risk, ensure that each employee has properly fitting and appropriate clothing and protective equipment, use equipment properly, keep the workplace clean and well lit, drive carefully, have regular safety meetings, be careful about falls from heights, maintain tools and equipment, understand OSHA rules and guidelines and follow them.

CONCLUSION

Exploration of foreign bodies in neck requires patience, anatomical and surgical expertise, high index of suspicion and sometimes an intra-operative imaging modality in order to precisely locate the impacted foreign bodies in edematous or crushed tissue planes. Preoperative imaging is very important in deciding upon the surgical approach for the retrieval of impacted foreign bodies and CT and MRI are equally efficient for it.

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