

A Metallic Foreign Body in Hand and its Acute Management in Emergency Department: Case Report

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Abstract

Penetrating injuries to the hand and fingers are frequent in the emergency department, particularly among laborers and workers in industries such as textiles, carpentry, and construction. The management of foreign bodies in the hand remains a topic of debate. This case report discusses a 35-year-old female who presented with a metallic button embedded in her right thumb following an accidental injury while stitching. The patient was stabilized, treated with tetanus prophylaxis, pain management, and underwent an uneventful removal of the foreign body under local anesthesia in a minor operating theater.

Studies indicate that hand and wrist injuries account for 10-30% of emergency visits, with complications ranging from pain and infection to functional impairment. Appropriate imaging, such as X-rays and ultrasound, is crucial for foreign body detection, especially when objects are radiolucent. Understanding hand anatomy is vital for successful and safe removal.

Prompt identification and removal of foreign bodies in the hand are essential to avoid complications. Most visible foreign bodies can be managed safely in an emergency setting, with ultrasound being a preferred tool for detecting radiolucent objects due to its availability and cost-effectiveness.

INTRODUCTION

Patients present to the emergency department with penetrating injuries of the hand and fingers are the most common among occupation/industrial

related accidents. Vulnerable population groups include laborers working in textile industries, carpentry, welding machine works, construction workers and mechanics. There is mixed opinion about management of foreign bodies in hand. Here by we are reporting case of metallic foreign body in

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hand managed in our emergency department.

CASE REPORT

A 35 years old female came to emergency department at around 3:30pm on 14/03/2024 with metallic button in her right thumb associated with pain and bleeding. On arrival she was conscious, oriented to time, place and person with pulse rate 100 beats per minute, blood pressure of 128/74 millimeter of mercury, saturation 97% at room air, respiratory rate of 17 cycles per minute & body temperature 98.5degree Fahrenheit.

On secondary survey, she revealed accidental metallic button struck in her right thumb, while stitching the clothes at her home. There were no significant neurovascular injuries. No history of diabetes, hypertension, asthma and thyroid disorders.

After initial assessment, patient treated with intramuscular tetanus toxoid 0.5 milliliter & diclofenac 75 milligram. Bleeding was stopped by wound pack with gauze piece. X-ray of right-hand anteroposterior & oblique view was taken and there was no bony involvement or fracture.

Patient and her attenders were explained about the removal of metallic button under local anesthesia. Informed written consent obtained. The patient was shifted to minor operation theater. Ring block was given by infiltrating 3 milliliter of 2% lignocaine plain around base of right thumb circumferentially. After confirming the effect of the local anesthetic, the metallic button was removed using artery forceps. Wound dressing was done & the procedure went uneventful. Check X-ray was obtained.

DISCUSSION

Penetrating injuries to the hand are a common occurrence in the emergency room, and embedment of foreign bodies is suspected in many of these cases.¹ The existing Indian literature offers little information on epidemiology of foreign bodies presenting to emergency department in India.

In a retrospective epidemiological study conducted by Martynas Tamulevicius *et al* in the emergency department of Hannover Medical School Germany the prevalence of hand and wrist injuries lies between 10-30% & male population comprised two-thirds of all patients.² The most common injuries include superficial lacerations

(53.9%), deep lacerations (37.16%), amputations (22.09%), metacarpal and finger fractures (49.25%), phlegmon of the hand and burns and corrosions of the hand (29.45%).

Patients presenting to emergency department with injuries to hand should undergo thorough assessment that includes collecting information about the medications, time of injury, occupations and also vaccination status (example: tetanus toxoid).

Physical examination should include through inspection for active bleeding, comparison of pulse with other limb, capillary refill time, joint instability and whether wound is clear or dirty.

Understanding the palmar anatomy of the hand and digits, is essential for safe foreign body retrieval. The immediate treatment options like surgical or medical management in emergency department for these injuries remain debatable. Complications have been described, including pain, infection, inflammation, neurovascular injury and impaired function.³ Moreover, more severe injuries are frequently associated with delayed recovery and the potential risk of long-term disability, incurring significant burden to the patient and healthcare system.

Plain radiography and ultrasound can be used to help localize foreign bodies. While plain radiographs identify only radiopaque material (examples: metal, glass, and some plastics), ultrasonography is a study of choice to identify radiolucent objects, given its ability to identify radiolucent foreign bodies, availability, and cost-effectiveness.⁴

The principle management of hand injuries involves immobilisation, primary medical management, obtaining imaging and tetanus prophylaxis.

Vaccination history of the patient should be thoroughly taken during wound management. Current guidelines recommend if the injury is severe or the patient's previous tetanus immunization history is unreliable, physicians may give a dose of Tetanus toxoid. In addition, passive immunization using tetanus immune globulin (TIG) may be needed for prophylaxis in cases of grade 4 wounds or presentation delayed by more than 6 hours.⁵

All injuries should be classified into different classes,⁶ so that we can predict likelihood of surgical complications.

- Class 1 wounds are categorized as clean wounds. These types of wounds are

not infected, do not exhibit any signs of inflammation, and are typically closed.

- Class 2 wounds are categorized as clean-contaminated, which means they have a low level of contamination.
- Class 3 wounds are classified as contaminated and typically result from a breach in sterile techniques or leakage from the gastrointestinal tract.
- Class 4 wounds are considered to be dirty or infected. These injuries usually occur from inadequate treatment of traumatic wounds, gross purulence, and evident infections.

Pain management is an important part of wound management in emergency department. Following the WHO pain management ladder to choose appropriate medications which can be done either with oral or injectable NSAIDs and opioids as well as local and regional blocks.⁷

Appropriate anaesthetic technique based on anatomical location should be used for wound management such as ring block, wrist block or brachial plexus block for fingers, palmar and dorsal aspects of hand, or wrist joint respectively.

If management of patient with foreign body hand requires multi-departmental approach, the decision should be taken by attending emergency physician. Conditions such as trauma tumor, sepsis, or vascular disease, may necessitate hand salvage.⁸

Speciality	Criteria
Orthopedics	Bone involvement +
Vascular surgery	Vascular damage associated with the injury/vascular injury post-removal of foreign body
Plastic surgery	Significant tissue loss/risk for hypertrophic scars or keloid formation, hand salvage needed to be done

Antibiotics play pivotal role in wound management in emergency department. The prophylactic use of antibiotics can reduce the risk of skin and soft tissue infection. The antibiotic of choice depends on the type of the wound, generally grade 3 and grade 4 wounds need coverage for gram positive, gram negative and anaerobic coverage.⁹

Management of hand injury is a multi-departmental approach including emergency medicine, general surgery, vascular surgery, orthopaedics and plastic surgery.¹⁰ Immediate management by emergency physician reduces the severity of injury and complications and patient

may get cost-effective benefit.

CONCLUSION

Patients presenting with foreign bodies in hand are common to emergency department. Most visible foreign bodies in hand can be removed safely under local anesthesia in emergency room by emergency physician. One should have knowledge about initial management and appropriate referral to other specialties when required.



Fig. 1: X-ray hand before and after removal of metallic button



Fig. 2: Ring block and metallic button removed

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