

The Outcome of Retained Metallic Foreign Bodies in Upper and Lower Limbs

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Abstract

Background: Retained metallic fragments represent a common problem that can be encountered in surgical practice.

They could be bullets, part of bullets or other fragments and shells from bombs or mines or in rare occasion, different foreign particles from the environment.

They are always the cause of patients complain to whom they refer their pain or disabilities and sometime they insist for their removal.

Operations for removal of deep retained foreign bodies are not beneficial, take long time and consume a lot of materials and sometime could be very risky, cause more damage and in some cases, ended without finding the foreign body.

There are only few indications for removal of retained metallic fragments.

Objectives: We want to assess the problem of retained metallic foreign bodies and find the indications of their removal.

Patients and Methods: This is a prospective study of 300 patients with retained metallic foreign bodies presented to the out-patient department of Alhindiya general hospital between July 2006 and July 2008 with different complains.

Results: Three hundred patients were included in this study, 264 patients(82%) were males and 36 patients (18%)were females, 270 patients about (90%) presented within the first week after injury, 243 patients(81%) have foreign bodies in the upper and lower limbs, 45 patients(15%) in the trunk and 12 patients(4%) in the head & neck.

Conclusion: Palpable foreign body can be removed safely and successfully in most of the cases while deep foreign body should not be removed unless there are indications.

Keyword: Retained foreign bodies, metallic fragments, bullets and penetrating wounds, missiles.

الخلاصة

دراسة مرتقبة لثلاثمائة مريض راجعوا العيادة الاستشارية لمستشفى الهندية العام للفترة ما بين شهر تموز 2006 وشهر تموز 2008 يشكون من إصابات نافسة وبقاء الأجسام الغريبة المعدنية داخل أجسامهم معظم الأجسام أما لطلق ناري أو جزء من الطلق الناري أو شظايا انفجار القنابل والألغام. وقد وجدنا بأن العمليات الجراحية لاستخراج الأجسام العميقة غير ناجحة وتستهلك الكثير من الموارد وفي بعض الأحيان قد تكون خطيرة.

Introduction

Penetrating injuries and suspected retained foreign bodies are a common reason for emergency department visit. Belkin et al ⁽¹⁾ reported that 38% of retained foreign bodies in the soft tissues were overlooked at initial examination. The most common

retained foreign bodies were wood, glass or metal slivers ⁽²⁾.

Metallic fragments are relatively common finding on x-rays of patients with penetrating wounds.

In most of the cases they are usually shells or fragments and sometime the whole bullet or ⁽³⁾ different foreign bodies.

The pathophysiology and management of foreign body wound is dependent on the material that has punctured the body, the location, depth and time of presentation, body wear and underlying medical condition of the patient.

Metallic fragments are usually incorporated in strong fibrous scar tissue that prevents further lead leak but this is not the case in bullet inside the joints where it will be in direct contact with the synovial fluid which may cause severe destruction and spreading of infection⁽⁴⁾.

Lead systemic toxicity may be a problem by the release from the bullet and cause multi-organ dysfunction in rare reported cases.

Migratory nature of a retained bullet in the brain and spinal canal has been reported in the literatures. Sometime even along a major blood vessel after eroding through the wall^(5,6).

Aim of the study

The aim of this study is to provide a clue to the problem of retained metallic foreign bodies and the indications of their removal.

Patients and Methods

A prospective study of 300 civilian and military patients with retained foreign bodies after penetrating injuries presented to the out-patient department of Alhindiya general hospital between July 2006 and July 2008 with different complains.

We only regarded the patients with retained metallic fragments that caused by bullets or blast injuries which were shown on x-ray examination.

The patients were divided into two groups:

Group (A): Palpable foreign bodies; 102 patients (34%).

Group (B): Deep foreign bodies; 198 patients (66%).

U/S examinations were done for patients in group B.

Surgical operations were done for all patients with palpable foreign bodies under local anesthesia while 60 patients with deep foreign bodies underwent operations under general anesthesia.

Results

Most of the complainers were among those who treated simply in the emergency rooms during their injuries, while the majority of patients who underwent major operations, during the initial injuries, were satisfied and not complaining from their retained fragments.

Almost all patients with the whole bullet in their bodies prefer to remove them. While most of the patients with multiple small shrapnel were convinced with the situation.

The majority of the patients had no special complain but they just want their foreign body to be removed, while the minority was complaining from pain or sometime inability to perform certain movements.

Fifty patients of them (19%) underwent major operations at the time of injury; the other 250 patients (84%) were treated in the emergency rooms only (in different hospitals), 264 patients (82%) were males and 36 patients (18%) were females, 270 patients about (90%) presented within the first week after injury (including those who treated in the emergency rooms and those who underwent major operations).

243 patients (81%) have foreign bodies in the upper & lower limbs.

45 patients (15%) in the trunk.

12 patients (4%) in the head & neck.

All the patients in group A underwent successful removal of the foreign bodies.

60 patients from group B underwent operations for removal of foreign body

(without fluoroscopy) which were successful in only 25 patients (41% success rate), 20 patients of them had associated abscess or sinus tract.

Table 1. Patients with operations

	Limbs	Trunk	Head& Neck	Total
Palpable F.B	80	18	4	102
Deep F.B	50	8	2	60

Discussion

The management of retained foreign bodies after penetrating injuries has been, and still is, a controversial subject.

Old injuries have inflammation, induration, scarring, and/or granulated tissue, making it more difficult to localize the foreign body.

The composition of the foreign body will influence evaluation and removal. Metal objects in soft tissue pose a lower risk of infection than organic matter⁽⁷⁾.

Imaging is not necessary if the foreign body is adequately palpable for removal^(8, 9) or if it does not require removal and this is what we found with our patients.

Plain radiography is the most economic and available method for viewing radiopaque foreign bodies. Ultrasound is an expensive, portable, and readily available imaging modality for superficial soft tissues without the risk of ionizing radiation^(10, 11). Ultrasound has emerged as the study of choice for detection of radiolucent foreign bodies, while in our results, we found that u/s is only of help in detecting the complications of the foreign bodies like associated abscess and not of great value in localization during operation.

For radiopaque foreign bodies, u/s can provide more precise localization^(12, 13). For all foreign bodies, u/s can aid assessment of the surrounding soft

tissues and demonstrate associated soft tissue complications.

The presence of local complications like abscess or sinus tract will be of great help in the localization during operation.

The use of electromagnetic metal detector enables precise localization of conductive missile fragments and minimizes the damage to the soft tissues during removal. It shortens the duration of the operation and in some cases enables removal under local anesthesia^(14, 15).

Removal Techniques

Foreign bodies from missile wounds should be removed at primary wound management. The edges of the missile wound should be excised, retracted and blood clot, dirt, debris and missiles are then removed from the sides and depth of the wound⁽¹⁶⁾.

Local infiltration or digital block can be used depending on the location of the wound^(17, 18).

Foreign bodies should be removed using direct visualization rather than blind probing whenever possible⁽¹⁹⁾.

In cases with many fragments in the wound, or in cases with mass casualties, that not all fragments can be identified and removed at primary wound care⁽²⁰⁾, They are usually of no clinical consequences but they can cause pain, neurological symptoms, vascular compression, sterile abscesses or granulomas, infection, lead sinovitis⁽²¹⁾ or even systemic lead intoxication.

They can cause complications due to migration. Furthermore, the presence of conductive or/and ferromagnetic missiles is a contraindication for

magnetic resonance imaging which is today a common and highly effective diagnostic procedure^(22, 23).

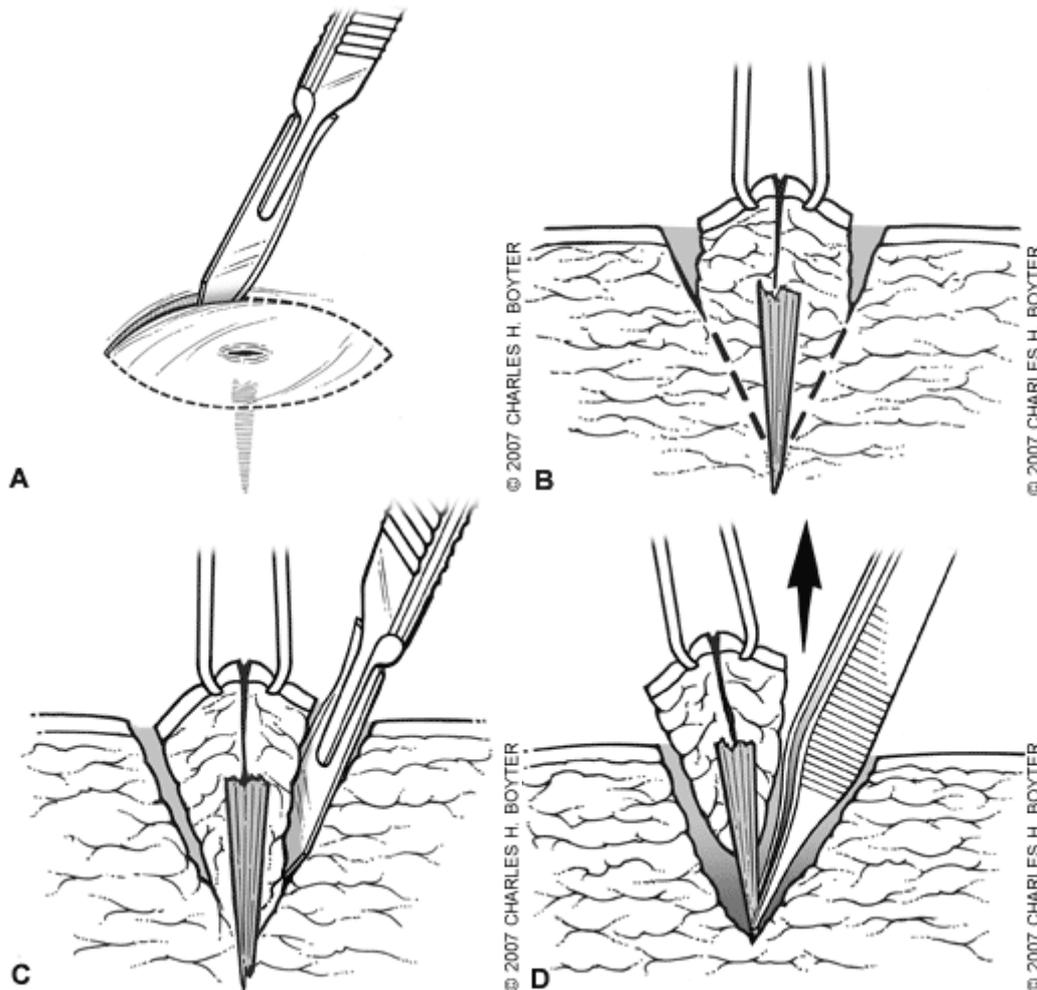


Figure 1. Removal of a deep foreign body. (A) Make an elliptical incision around the entry wound. (B) Grasp the elliptical area of skin with an Allis forceps. (C) With gentle upward traction, incise downward from the edges on both sides toward the center until the foreign body is felt. (D) The entire elliptical area of skin and foreign body can then be grasped and removed.

(Gwen Wagstorm American family physician journal 2007.)⁽²⁴⁾.

Conclusions

Usually retained foreign bodies are not harmful

Palpable foreign body can be removed safely and successfully in most of the cases.

Deep foreign body should not be removed unless there are indications.

Most of the operations for deep foreign body removal are time, materials consuming and not successful.

Recommendations

-You can remove palpable foreign body with simple operation and under local anesthesia in most of the cases.

- Deep foreign body should be removed only if they are:

1-Causing localized infection (abscess or sinus and fistula).

2-Disturbing the function like foreign body in a joint.

3-Causing persistent pain or disability.

References

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