

SOFT TISSUE FOREIGN BODY REMOVAL USING A NEEDLE-BASED TECHNIQUE

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ABSTRACT

Introduction: A missed or neglected foreign body (NFB) is not infrequent in surgical practice. It constitutes a common reason for consultation later. Location and removal of foreign bodies can be difficult because of possible inflammation, induration, granulated tissue and fibrous scar. This paper describes a simple method for the quick localization and surgical removal of NFB using two 25gauge needles.

Materials and Methods: In this paper we report the experience of the department of plastic and reconstructive surgery in IbnSina Teaching Hospital in Rabat, conducted on twelve patients in terms of the use of two 25-gauge needles in 12 NFB in soft tissue in order to achieve proper localization and fixation of foreign bodies during surgery.

Results: Results were satisfactory in most of our patients; surgical removal was successful in 11 of 12 NFB.

Conclusion: Needle guided technique allows the successful surgical removal of NFB using minimal soft tissue exploration and dissection via proper localization, fixation, and propulsion of the foreign body toward the surface of the skin.

Keywords: Foreign body, Soft tissue, extraction

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INTRODUCTION

The phenomenon of soft tissue and skin wounds are common in the emergency department but retained foreign bodies in these wounds are frequently overlooked .It constitutes a common reason for consultation later and may present to dermatologists and plastic surgeons as delayed wound healing, localized cellulitis and inflammation, abscess formation, or foreign body sensation. Localization and removal of NFB is complex due to possible inflammation, indurations, granulated tissue, and fibrotic scar. This paper describes a simple method for the quick

localization and removal of NFB using two 25 or 23 gauge needles according to NFB size.

METHODS

We report in this study twelve patients aged between 12 and 58 years, including eight males and four females, admitted to our department between July2012 and September 2014. Patient complaints included foreign-body sensation, local inflammation at the site of an old scar; these injuries had taken place 2 to 10 (mean: 6) years ago. Among 12 foreign bodies detected by physical examination, one was located in peri-orbital area and three in the forehead, five in

the forearm, two in the hand and one was in the foot. Plain radiographs were obtained from all patients before the operation, five of which were negative. The Intervention starts with basting the area by Betadine then topical anesthesia, Eutectic Mixture of Local Anesthetics (EMLA) cream, was applied 45 min before surgery. After palpating carefully for foreign bodies or a point of maximum tenderness, the first 25gauge needle tip was inserted into the skin through a point 5 mm away from the foreign body site and was advanced below it. After introducing the first needle we can use some of xylocaine with epinephrine if the foreign body was located in a bloody area.

Then, a second 25gauge needle was inserted across the first needle and below the foreign body in the same manner to help localize the foreign body and propel it towards the surface of the skin (Figure 1).



Figure1: Localization of a forearm foreign body in a 25-year old man 4 years after a slip and falling.

A tourniquet can be placed in the member to minimize bleeding. Once localization was achieved, an incision was made directly over the fixed NFB using a number-15 scalpel blade. Finally, by minimal dissection, the NFB is exposed to the outside and removed from the body (Figure 2 and 3).



Figure 2: Removal of a forearm foreign body via a small incision in the same patient.



Figure 3: neglected soft tissue foreign body (thorn of tree pipal) having a size of 7 mm.

Hemostasis was obtained by dabbing the wound which were repaired using separate nylon sutures (Figure 4).



Figure 4: suturing the small incision by a single point.

One patient received oral antibiotics for 8 days after the procedure, indication for others has not been raised and sutures were removed 7 days after surgery.

RESULTS

The postoperative course was simple, no postoperative complications detected. The needle guided technique allowed the successful surgical removal of NFB (11 of 12 cases). the NFB successfully removed were approximately 2 to 10 mm in diameter, including five small pieces of glass, three small metal objects and four thorns of tree pipal (figure 3).

Surgical removal was unsuccessful in the case of one NFB with a negative radiograph, located in the dorsum of the hand. We discontinued further blind wound exploration in this case, and we were forced to broaden the incision. Ecchymosis that resolved spontaneously after 10 days was observed in one patient after surgery in the periorbital area. Noticeable scars were not observed at all operation sites.

Pre and postoperative neurologic and functional examinations were unremarkable.

DISCUSSION

Patients with skin and soft tissue wounds commonly present to the emergency department for evaluation and treatment. In examination of these patients, it is essential to carefully assess the retained foreign bodies, as they are frequently missed on initial evaluation [1, 2] and constitute a significant cause of morbidity in soft tissue injuries. However, NFB may present to plastic surgeons and dermatologists simply as delayed wound healing, localized cellulitis and inflammation, abscess formation, or foreign body sensation [3]. Radiologic evaluation of soft tissue injuries plays an important role in detecting, evaluating, and planning the potential removal of a foreign body. Radiography is the most useful investigation in detecting radiopaque foreign bodies with sensitivity of more than 95%, especially when multiple views are taken and penetration is adequate [4]. However, for the detection of non radiopaque foreign bodies, ultrasonography offers a high sensitivity and specificity [5, 6]. Computed Tomography is superior to ultrasonography of the exact localization of the foreign body [7]. Magnetic resonance imaging is rarely used in foreign body detection during the initial emergency department visit [8]. These localization techniques play an important role in the detection and removal of foreign bodies, particularly those that are radio opaque and deeply embedded in the tissue or not easily identified by clinical examination, or if they are located close to a vital structure or associated with neurologic or functional complications [9]. The potential complications due to the process of foreign body removal must be considered, including the following [10]:

- Enlarging the wound or creating an additional wound.
- Blunt or sharp dissection of nearby tissues.
- Chemical or electrocautery required for haemostasis.
- Additional infection risk for soft tissue that may require cosmetic repair with sutures following removal of the foreign body.
- Additional neurovascular injury.

Indications for removal of a foreign body include: neurovascular compromise, foreign bodies too close to a neurovascular structure and with potential for migration, evidence of infection, potentially toxic foreign body, organic foreign bodies, cosmetic deformity, functional impairment, chronic pain, and patient request [7]. The most important step in the removal of a

NFB is accurate localization, followed by perfect incision and dissection of an old scar to identify the foreign body surrounded by fibrotic scar tissues. A technique has previously been reported in which two small needles are inserted under fluoroscopic guidance into the skin at perpendicular angles until they are touching the foreign body. An incision is then made between the two needles and the foreign body removal is achieved by blunt dissection [11]. The principle disadvantages of these approaches are the likelihood of failure to remove the foreign body and the potential risk of injury to adjacent structures due to the absence of prior localization and fixation of NFB and excessive blind dissection [12].

In this study, the technique of needle guided NFB surgical removal was successful in 11 of the 12 NFB. This method is a simple office-based technique that allows proper localization, fixation, and propulsion of the foreign body towards the surface of the skin. This surgical approach leads to a reduction in the size of the incision and prevents foreign body sliding during incision and dissection. All foreign bodies in our patients were identified by palpation or by identifying a point of maximum tenderness, and were located in anatomically safe areas. Precise identification of NFB by clinical examination is necessary with this technique, and the most important step in the localization of the small foreign bodies is a meticulous insertion of the first needle; Finally, it is important to remove NFB with minimal dissection and in an a traumatic manner, especially in the face and exposed areas that are cosmetically important for patients [13].

CONCLUSION

The cross needle guided technique is one of several techniques used for the surgical removal of NFB, it is a simple, effective, and easy technique for the location, fixation, and propulsion of NFB towards the surface of skin; it can be used by dermatologists and plastic surgeons in their medical practice without operative assistance. Among its limitations is the deep location and proximity of a risk area.

Declarations

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The authors declare that they have no conflict of interest.

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