Clinical Communications: Adults

FISHHOOK REMOVAL: CASE REPORTS AND A REVIEW OF THE LITERATURE

Michael Prats, MD,* Michael O’Connell, MD,† Austin Wellock, MD,† and Nicholas E. Kman, MD, FACEP†

*College of Medicine and †Department of Emergency Medicine, The Ohio State University, Columbus, Ohio

Reprint Address: Nicholas E. Kman, MD, FACEP, Department of Emergency Medicine, The Ohio State University Medical Center, 780 Prior Hall, 376 West 10th Avenue, Columbus, OH 43210

Abstract—Background: Fishhook injuries are common among people who fish for recreation, but can be encountered in anyone who has handled a fishhook. They represent a unique challenge for Emergency Physicians who seek to remove them without causing further tissue damage from the barbed nature of the hook. Objective: Our aim was to discuss the techniques available to providers in the removal of a barbed fishhook by illustrating actual cases seen in the Emergency Department. Case Reports: We present two cases of patients with fishhook injuries. We discuss the proper assessment of these injuries. We describe techniques for removing a barbed hook from a patient’s skin and offer images to guide management. Conclusions: Understanding the unique nature of fishhook injuries and awareness of techniques to manage them are essential to the practicing Emergency Physician. © 2013 Elsevier Inc.

Keywords—fishhook; foreign-body removal

INTRODUCTION

Fishing is a commonly enjoyed recreational activity that presents specific hazards related to the use of barbed hooks. We present two cases of patients who presented with a fishhook embedded in a finger.

CASE REPORTS

Case 1

The patient was a 25-year-old woman who presented to the Emergency Department with a complaint of a fish-hook embedded in her finger. The multiple-barbed fishing lure had been hanging from her rearview mirror as a decoration; she swung her hand around without looking and caught one of the barbs with her finger. Bleeding was controlled at the time of presentation. She denied other complaints. Her tetanus immunization status was reviewed and found to be current.

Physical examination revealed a fishing lure with a trebled barb on either end; a single barb was embedded into the pad of her fifth digit between the distal interphalangeal and proximal interphalangeal joints. The hook appeared to be between 5 and 7 mm deep to the epidermis with the barb beneath the skin. Distal sensation, tendon function, and perfusion were all intact. No other injuries or abnormalities were noted. Figure 1 shows the actual presentation.

Case 2

Our second patient is a 23-year-old man who presented to the Emergency Department 2 h after accidentally embedding a fishhook in his thumb. This was a single-barb hook attached to a multi-hook lure. It had become embedded when the patient was attempting to remove it from his backpack. Before presenting, the patient tried to remove the hook himself but had only succeeded in bending the hook within his finger and causing a great deal of pain. Bleeding was controlled at the time of presentation. The patient complained of mild numbness in his injured fingertip, but otherwise denied additional symptoms.
His tetanus immunization status was reviewed and found to be current.

On physical examination, a single barb of the fishhook was found to be embedded under the nail of the patient’s right first digit, with the point of the hook buried, facing the palmar surface. It was estimated to be 7 to 9 mm deep to the epidermis. The patient noted decreased sensation surrounding the entry point of the hook. Tendon function and perfusion of the digit were found to be intact, and no other abnormalities were noted on examination. Figure 2 shows actual presentation of the patient.

DISCUSSION

Fishhook injuries can occur while fishing, handling a hooked fish and attempting to remove it, while casting, or from stepping on or grabbing at hooks that are not seen.

Fishhook injuries require special attention due to the barb at the distal aspect of the hook that prevents simple removal. Caution must be used in removal to prevent further injury to underlying tissue and to prevent discomfort to the patient. Specific techniques have been developed to meet these aims. Complicated wounds, such as those involving the eye and those deeply embedded near tendons, blood vessels, and nerves should be referred to a specialist (1). Fishhook injuries to the eye can involve significant vision loss and can even involve intracranial trauma and should be sent for ophthalmologic consultation (2).

General Assessment

History and physical examination. Obtain a history including the time of the event, circumstances, attempts at removal before arrival, and tetanus status. Any comorbidities that might prevent healing should be reviewed.

The provider should evaluate the injury for significant abnormalities, such as vascular or nerve injury, soft-tissue injury, or even bone or cartilage involvement. Most fish-hook injuries are penetrating soft-tissue injuries to the hand, face, head, or upper extremity (2).

If local anesthetic is to be used, sensory examination before administration is essential. If the hook remains attached to bait, a fishing line, or other hooks or sharp edges, they should be removed or protected to prevent injury to the patient and provider.

Imaging. X-ray studies can provide additional information with respect to presence of internally embedded barbs, depth of penetration, or bony involvement (1). More often than not, this is a clinical diagnosis and imaging is not necessary.

Principles of Removal

The first step to removal is local care. The injury site should be cleaned with povidone-iodine or hexachlorophene solution before attempting removal (2). Saline irrigation might be required. Techniques should then be
undertaken to protect the medical provider. Fishhooks with more than one point should have the uninvolved points taped or cut to avoid imbedding these during the removal procedure. The physician and bystanders should take care not to be struck by the hook on removal. Eye protection should be worn, especially when performing the string-yank method. Next, all items attached to the hook (i.e., fish line, bait, and the body of the lure itself) should be removed.

Injection of local anesthetic is the best means to provide analgesia to the patient. This can be performed using either local direct infiltration or a field or nerve block, depending on the location of the hook.

Several techniques are described in the literature, all of them aimed at mitigating the unwanted outcome of the barb cutting through more tissue during retrograde movement and causing further injury. Wilderness medicine and Emergency Procedure texts describe four techniques; the string-yank, needle cover, retrograde, and advance and cut (3,4). Two more techniques are to simply cut the needle out under local anesthesia or to advance it all the way out without cutting. The choice of the method for removal depends on the type of fishhook, the location of the injury, and the depth of tissue penetration (2). There has been only one study that has looked at success rates with each technique, with advance and cut removal having the highest rates of success (5). Occasionally, more than one removal technique might be required.

String-yank method. The string-yank and the retrograde methods are generally the first to be attempted as they result in the least amount of tissue trauma (2). The

Figure 3. (A) String-yank method. Arrows represent direction of force to be applied. Downward pressure toward barb is applied during simultaneous pull on string. (Illustration by Lindsay Joos Prats.) (B) String-yank method. Shows practitioner (A.W.) fitting a 1.0 silk suture thread for removal of the hook. Before removal, the additional hooks on the barb should be taped, covered, or cut to prevent accidental puncture of practitioner or patient. (Permission to use the photo was granted by the patient.)

Figure 4. Retrograde method. Arrows represent direction of force to be applied. Downward pressure toward barb is applied with simultaneous retrograde force. (Illustration by Lindsay Joos Prats.)
string-yank method is useful when anesthesia is unavailable or the barb lies too deep to force it out through a second wound (4). In this method, a string is placed around the hook and tied in a way to provide tension parallel to the shank of the hook. Pressure is then placed perpendicular to the shank to disengage the barb, thereby moving it into the original pathway of cutting. As the barb is placed in the original pathway, the string is pulled to allow the partially embedded hook to recede through the initial path of the barb (Figure 3). Bystanders should be out of the expected path of the hook. In one study that looked at fishhook removal techniques in Alaska, 17.5% of fishhooks (17 of 97) were successfully removed using this technique (5). Figure 3B depicts the practitioner attempting this method in case 2.

**Retrograde method.** This is the simplest, but often least effective method. Downward pressure is applied to the shank of the hook (toward the barb) in an effort to disengage the barb from the surrounding tissue. This may be effective when removing very superficially located hooks or ones where the barb is exposed. While holding this pressure, the hook is gently removed along its original path (Figure 4). If met with continued resistance, this method should be aborted to prevent further pain and tissue damage. Although this method is often not effective, it may prove successful in cases of superficially embedded or barbless hooks. In the 1991 series described here, this technique was also successful in 17 of 97 patients (17.5%) (5).

**Needle cover method.** The needle cover method aims to neutralize the barb of the hook by covering it within the hollow point of a needle. Local anesthetic is administered to the entrance site of the wound. A needle tip is then advanced toward the embedded barb parallel to the shank of the hook. An 18-gauge needle generally provides adequate size to cover the barb while minimizing additional trauma to the tissue. It is important to note that the needle bevel should face toward the barb in order to cover it. Once this is accomplished, the hook and needle are removed together along the original path of the hook (Figure 5A). It is also possible to perform a variation of this method using a no. 11 blade in place of a needle. The blade is inserted in a similar fashion, used to free the hook from surrounding tissue, and then cover the
barb during subsequent removal (4). This technique was successful in 7 of 97 patients (7%) (5). We were successful in using this technique in both cases described here. Figure 5B shows the practitioner attempting this technique in case 2.

**Advance and cut method.** As the name indicates, in performing this method the embedded hook is advanced through the skin to where the barb can be clipped off and the remainder of the hook removed. Local anesthesia should be applied to the area through which the barb will be forced. Grasping the hook with a hemostat or needle driver, pressure is applied in an effort to push the barb to the skin while passing through as little tissue as feasible. Once through the anesthetized skin, the barb is removed (Figure 6). The hook then can be removed in a retrograde pathway, or in the case of multiple barbs on the shank, it may be desirable to cut off the eye of the hook and advance the entire hook through. This technique was successful in 56 of 97 cases where this was studied (58%) (5). This technique is limited in cases where the hook cannot be advanced to cut, such as common cases in the finger where bone or fingernail is involved.

**Advance without cut method.** In this technique, described with an eyelid injury, the hook was advanced into the subcutaneous tissue in a forward direction and was extracted from a second exit wound of the lid without cutting (6). No sutures were placed in this technique. Although only a case report, this may represent a way to remove a hook in shallow subcutaneous tissue (e.g., eyelid) with minimal manipulation.

**Cut it out method.** This method utilizes a technique similar to that in the needle cover method. After local anesthesia, an initial incision is made at the entry point of the hook and the scalpel blade is advanced along the hook until the barb is met. The hook is then removed along the created incision and proper irrigation of the wound can take place. It is recommended that scissors or hemostats be used to bluntly dissect tissue for particularly deeply embedded hooks in order to minimize trauma to nerves or vessels. This technique can be traumatizing to tissues and is best used as a rescue technique if other methods fail.

**Post-Removal Wound Care**

After removal of the fishhook, the wound should be explored for possible retained foreign bodies. It is typically left open, as these wounds tend to be contaminated. After removal, antibiotic ointment and a simple dressing are applied (7). Antibiotics can be considered, but there is not a formal recommendation.

**Case Resolutions**

The patient in case 1 was anesthetized using a digital nerve block of the fifth digit. The fishhook was then removed using the needle cover method without complication. The barb on the hook prevented simple retrograde removal. The patient in case 2 was anesthetized using a digital nerve block of the first digit. The string-yank method was attempted without success. The needle cover method was then utilized and resulted in successful removal of the fishhook. There were no complications during the procedure. In both cases, the wounds were dressed using a topical antibiotic ointment. The patients were given tetanus immunization if indicated.

**CONCLUSIONS**

There are several different methods described in the literature for removal of fishhooks. We have shown figures demonstrating these techniques, which have been successful in the Emergency setting. Choosing which method to use depends on the location and depth of the fishhook embedded in the patient’s skin.
REFERENCES