

Distal Migration of a Foreign Body (Sago Palm Thorn Fragment) Within the Long-Finger Flexor Tendon Sheath

Jianli Bu, MD, Kristi A. Overgaard, BSc, and Steven F. Viegas, MD

Common puncture injuries to the hand involve items such as glass, metal, and wood splinters; plant thorns; and fish spines. Most often, these injuries are resolved with little or no medical intervention. However, diagnosis and treatment of these injuries can become more difficult if any foreign body material is retained in the wound. Common complications from retained foreign bodies include persistent pain, infection, and tendon or nerve damage.¹ A less common complication is migration of the retained foreign body away from the initial site of injury. Although distal²⁻⁴ and proximal⁵ migration of foreign bodies has been documented in injuries originating at the wrist, these reports are rare. Migration of a foreign body is not usually a factor considered during diagnosis. Therefore, a foreign body that has migrated can easily be missed by diagnostic imaging and surgical exploration, which are targeted at the site of injury.

In this article, we report the case of a foreign body that migrated presumably within the tendon sheath from the distal palmar crease of the hand to the middle phalanx. This case illustrates that migration is a possibility that should be kept in mind when diagnosing and treating patients with injuries caused by foreign bodies in the hand.

CASE REPORT

A 35-year-old right-hand-dominant woman presented to the orthopedic clinic complaining of palm and long-finger pain in the right hand 1 day after being punctured by a sago palm thorn. The patient believed she had removed the entire thorn at time of injury. Physical examination showed a small puncture wound in the right palm at the distal palmar crease, in line with the long finger. The patient had full

range of motion, including independent flexor digitorum superficialis and profundus function. She did not have pain or swelling along the flexor tendon sheath of the long finger. However, she did have slight tenderness with active maximum extension of the long finger. X-rays of the right hand were unremarkable. The patient was placed on a 10-day course of oral cephalexin 250 mg 4 times a day.

Ten days after injury, the patient's symptoms were essentially unchanged, except that some swelling developed in the right long finger (Figure 1). The palmar puncture wound site was surgically explored, and no foreign body fragments were found. In addition, the tendons, retracted and delivered through the skin incision, appeared normal. Histopathology of a specimen intraoperatively biopsied from the flexor tendon sheath showed some refractile foreign material consistent with plant material.

After surgery, swelling persisted, and the patient developed limited motion at the extremes of active flexion and extension. After 2 months, the decision was made to reexplore the palmar puncture site and flexor tendon and obtain tissue specimens for culture, including atypical mycobacterial and fungal cultures. During the second surgery, the palmar site and flexor tendon still appeared unremarkable. As there was some swelling in the long finger, the flexor tendon sheath was explored distally through a separate incision over the middle phalanx. A transversely oriented fragment of the sago palm thorn was found within the flexor tendon sheath (Figure 2). Flexor tendon sheath material was cultured and subsequently found to be negative.



Figure 1. Site of puncture wound along distal palmar crease 10 days after injury and before surgery. Swelling of right long finger is also visible.

Dr. Bu is Orthopaedic Surgeon, Third Military Medical University, Heping (Peace) Hospital, Shijiazhuang, China.

Ms. Overgaard is Editorial Assistant, and Dr. Viegas is Professor and Chief, Division of Hand Surgery, Department of Orthopaedic Surgery and Rehabilitation Medicine, University of Texas Medical Branch, Galveston, Texas.

Address correspondence to: Steven F. Viegas, MD, Division of Hand Surgery, Department of Orthopaedic Surgery and Rehabilitation Medicine, 301 University Blvd, Galveston, TX 77555-0165 (tel, 409-747-4263; fax, 409-747-9467; e-mail, sviegas@utmb.edu).

Am J Orthop. 2008;37(4):208-209. Copyright Quadrant HealthCom Inc. 2008. All rights reserved.



Figure 2. Puncture site reexplored 2 months after injury still did not show retained thorn fragment, but the distal flexor tendon sheath in the long finger just proximal to the A4 pulley revealed a transversely oriented thorn fragment lying within the tendon sheath.

After the second surgery, the swelling resolved, and the patient's right long finger regained full range of motion. The patient had normal function and no symptoms at 9-month follow-up.

DISCUSSION

The hand is perhaps the most common site for foreign body injury. In most cases, the foreign body is removed, and no medical follow-up is required. When medical care is needed, clinical examination, imaging, and surgical exploration, if performed, are targeted at the initial wound site. As many foreign bodies are small or brittle, it is not uncommon for fragments to be unintentionally left behind in the tissue at initial treatment.¹ Retained foreign bodies can be difficult to diagnose—an accurate history may be hard to obtain, imaging studies may not be specific for the particular type of retained material, and a large surgical exploration may not be possible. These difficulties are compounded when the foreign body migrates from the original site of injury.

Migration of foreign bodies in the hand has been noted in previous case reports.²⁻⁵ According to this literature, symptoms of pain or swelling caused by a migrated foreign body can occur days, months, years, or even decades after the initial injury, so it may be difficult to get an accurate history. Even if the history is accurate, the foreign body may have migrated almost any distance from the initial injury site. Ultrasound is considered the most sensitive imaging modality for plant material.⁶⁻¹⁰ Failla and colleagues⁶ reported using ultrasound to identify a 0.5-mm thorn. If the material has migrated, however, locating it may be difficult with any imaging study. The same is true when surgical exploration is used to make a diagnosis.

We speculate that, in our patient's case, the foreign body was able to migrate because of several injury-site factors (including the anatomy of the tendon sheath) and the characteristics of the retained thorn fragment. When the patient pulled the thorn out immediately after injury, part of it

remained in the tissue adjacent to or within the tendon sheath. The tendon sheath is a closed space that is under pressure.¹¹ Inflammation at the wound site can increase this pressure,¹² which could have pushed the fragment forward in the sheath space. The motion of the flexor tendon may have pushed the fragment more distal, while the shape of the fragment could have prevented it from moving back down, thus aiding in its migration. The fragment had a sharp point with a wide, blunt base, where it appeared to have broken off. We theorize that the combination of these factors allowed the fragment to migrate far in the tendon sheath. Although the fragment appeared to have traveled through the A1 and A2 pulleys, distal migration apparently halted just proximal to the A4 pulley because of limited space within the A4 pulley and/or transverse orientation of the fragment. This migration led to difficulties in the diagnosis and treatment of the case.

CONCLUSIONS

We believe that the entire flexor tendon sheath should be thoroughly examined in cases in which a foreign body is introduced anywhere along the sheath and persistent symptoms indicate presence of a retained foreign body. The potential for migration should be kept in mind when diagnosing and treating these cases.

AUTHORS' DISCLOSURE STATEMENT

The authors report no actual or potential conflict of interest in relation to this article.

REFERENCES

- Anderson MA, Newmeyer WL 3rd, Kilgore ES Jr. Diagnosis and treatment of retained foreign bodies in the hand. *Am J Surg*. 1982;144(1):63-67.
- Merrell JC, Russell RC, Zook EG. Nonsuppurative tenosynovitis secondary to foreign body migration. *J Hand Surg Am*. 1983;8(3):340-341.
- Yang SS, Bear BJ, Weiland AJ. Rupture of the flexor pollicis longus tendon after 30 years due to migration of a retained foreign body. *J Hand Surg Br*. 1995;20(6):803-805.
- Chow J, Schenck RR. Foreign body migration in the hand. *J Hand Surg Am*. 1988;13(3):462.
- Choudhari KA, Muthu T, Tan MH. Progressive ulnar neuropathy caused by delayed migration of a foreign body. *Br J Neurosurg*. 2001;15(3):263-265.
- Failla JM, van Holsbeeck M, Vanderschueren G. Detection of a 0.5-mm-thick thorn using ultrasound: a case report. *J Hand Surg Am*. 1995;20(3):456-457.
- Jacobson JA, Powell A, Craig JG, Bouffard JA, van Holsbeeck MT. Wooden foreign bodies in soft tissue: detection at US. *Radiology*. 1998;206(1):45-48.
- Soudack M, Nachtigal A, Gaitini D. Clinically unsuspected foreign bodies: the importance of sonography. *J Ultrasound Med*. 2003;22(12):1381-1385.
- Russell RC, Williamson DA, Sullivan JW, Suchy H, Suliman O. Detection of foreign bodies in the hand. *J Hand Surg Am*. 1991;16(1):2-11.
- Adams CD, Timms FJ, Hanlon M. Phoenix date palm injuries: a review of injuries from the phoenix date palm treated at the Starship Children's Hospital. *Aust N Z J Surg*. 2000;70(5):355-357.
- Hunter JM. Anatomy of the flexor tendon—pulley, vincular, synovia, and vascular structures. In: Spinner M, ed. *Kaplan's Functional and Surgical Anatomy of the Hand*. 3rd ed. Philadelphia, PA: Lippincott; 1984:65-92.
- Schnall SB, Vu-Rose T, Holtom PD, Doyle B, Stevanovic M. Tissue pressures in pyogenic flexor tenosynovitis of the finger. Compartment syndrome and its management. *J Bone Joint Surg Br*. 1996;78(5):793-795.