A Delayed Allergic Reaction to Polypropylene Suture Used in Flexor Tendon Repair: Case Report

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We report a patient who developed a delayed hypersensitivity reaction to a polypropylene suture used in flexor pollicis longus repair. We also review the literature and aim to increase the awareness of hand surgeons to the presentation, diagnosis, and management of these rare cases. *(J Hand Surg Am. 2015;40(7):1377–1381. Copyright © 2015 by the American Society for Surgery of the Hand. All rights reserved.)*

Key words Suture, allergy, flexor tendon.

TWO DIFFERENT TYPES OF REACTIONS are known to occur in response to sutures and devices used in flexor tendon repair: early foreign body and delayed hypersensitivity (allergic) reactions.

At the histological level, foreign body reactions to sutures occur in 100% of cases and are characterized by an inflammatory zone around the suture and the presence of multinucleated giant cells.[1] This is generally considered as a "normal" body reaction to any foreign material at any site and is not specific for flexor tendons. In most cases, the foreign body reaction has no clinical importance, although severe reactions may be symptomatic and present as discharging skin sinuses (with aseptic drainage) at the site of flexor tendon repair.[2] Experimentally, authors quantify this microscopic reaction either by measuring the width of inflammatory zone (WIZ) or by counting giant cells per high-power field.[1] Generally, foreign body reactions to absorbable sutures such as polyglactin are more intense than reactions to nonabsorbable sutures.[2] Esenyel et al[1] studied the early foreign body reaction to various nonabsorbable sutures used in Achilles tendon repair. This early reaction was severe with braided polyester, moderate with polypropylene, and relatively mild with polyethylene. Esenyel et al[1] considered a mean WIZ of less than 2 mm as mild, 2 to 6 mm as moderate, and more than 6 mm as severe.

Delayed hypersensitivity reactions to sutures are rare and occur late. Furthermore, the presentation is variable and the patient does not usually have a history of an allergic reaction to sutures. Hence, the diagnosis is usually delayed or missed. This entity has not received much attention in the hand surgery literature.[3] We report a patient who developed a delayed hypersensitivity reaction to a polypropylene suture used in flexor pollicis longus repair. We also aim to review the literature on this entity and increase the awareness of hand surgeons to the presentation, diagnosis, and management of these rare cases.

CASE REPORT

A 30-year-old man sustained a glass laceration resulting in zone I injury of the flexor pollicis longus tendon. Repair was done at his local hospital with a polypropylene core suture. No peripheral sutures were used, and the skin was closed with polyglactin sutures. The postoperative course was uneventful with recovery of 0° to 50° of motion at the interphalangeal (IP) joint of the thumb. Two and a half months later, the patient noted a slowly growing diffuse subcutaneous swelling at the site of tendon repair, and the range of motion at the IP joint decreased to 0° to 40° despite home exercises. The patient obtained medical advice from several hand surgeons (including the original surgeon), and he was given the clinical diagnosis of

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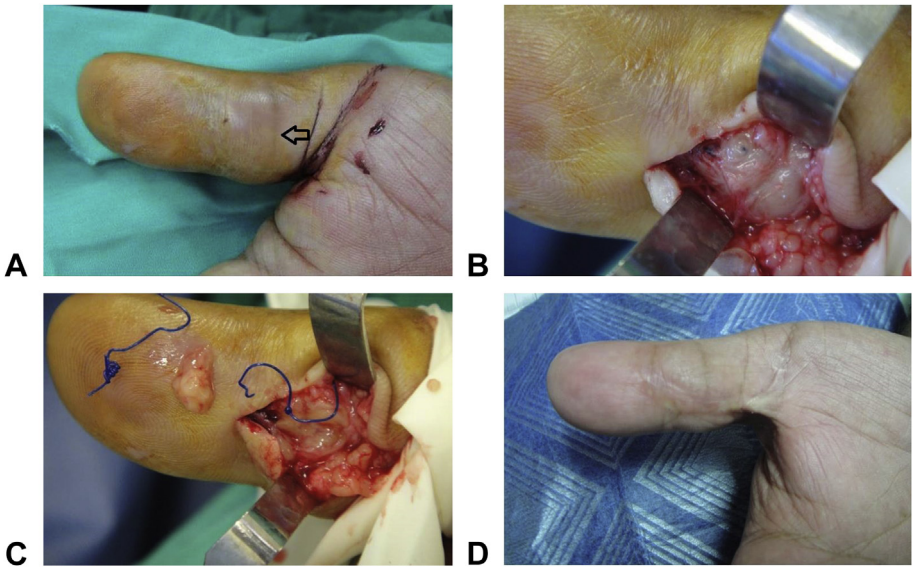

FIGURE 1: Clinical pictures. **A** Intraoperative picture following digital block. Note the mass (arrow) at the site of the tendon repair. **B** The thin white pseudocapsule surrounding the tendon repair site. **C** This layer was incised, and the suture was removed. Note the gelatin-like material. Only biopsies were taken, and no attempt was made to completely excise the mass. **D** Complete resolution of symptoms one month following removal of the tendon suture.

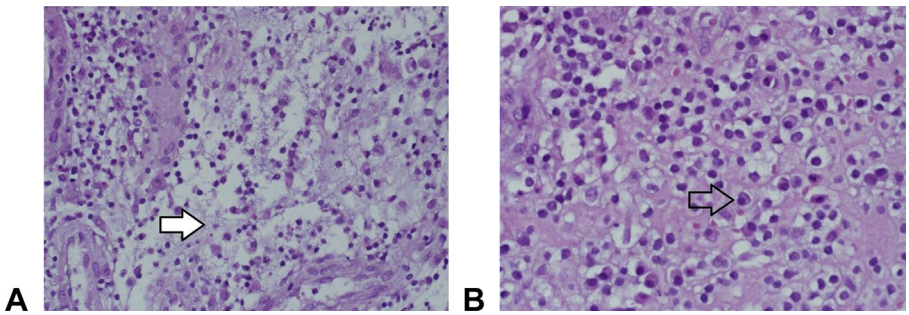

FIGURE 2: Histopathological pictures. **A** Low power (hematoxylin-eosin stain; magnification × 40) shows chronic inflammatory cells in a myxoid background (arrow) and no granuloma formation. **B** High power (hematoxylin-eosin stain; magnification × 400) shows plasma cells (arrow).

excessive fibrosis. Advice was given to do daily massage and continue exercises. The patient presented to the senior author (M.A.-Q.) at 14 weeks postrepair (Fig. 1). The diffuse subcutaneous swelling measured 2 × 1 cm and was slightly tender on palpation. There was no overlying erythema or blistering. The active range of motion at the IP joint was 0° to 25°. There were no constitutional symptoms (such as fever), no lymphadenopathy, and no other abnormalities on systemic examination. Complete blood count showed mild lymphocytosis (4,100/μL) and the erythrocyte sedimentation rate (ESR) was 20 mm/h. X-ray of the thumb showed no bony abnormalities or soft tissue calcifications. Surgical exploration was done under a digital block. Upon elevation of the skin, a thin white pseudocapsule was seen surrounding the tendon repair site (Fig. 1). The pseudocapsule was incised, revealing gelatin-like material surrounding the blue polypropylene suture. The suture was removed and biopsies were taken for bacterial, fungal, and mycobacterial cultures and for histopathological examination. No attempt was made to completely remove the mass because the diagnosis was still unclear and because of the potential risk of tendon rupture. The skin was closed using polyglactin sutures, and no orthosis was used. No antibiotics were given. The postoperative recovery was uneventful, and all cultures were negative. Histopathological examination showed chronic inflammatory cells (foamy histiocytes, lymphocytes, and plasma cells) in a myxoid background (Fig. 2). There were only few