Foreign-Body Reaction and Osteolysis Induced by an Intraosseous Poly-L-Lactic Acid Suture Anchor in the Wrist: Case Report

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Polyglycolic acid and poly-L-lactic acid have become popular choices for bioabsorbable anchor fixation in the hand and wrist. We report a case of osteolysis, synovitis, and chondral erosion secondary to a poly-L-lactic acid suture anchor in the wrist. *(J Hand Surg 2011;36A:1769–1773.*

Key words Poly-L-lactic acid, scapholunate ligament, suture anchor.

Bioabsorbable suture anchors have risen in popularity in upper extremity soft tissue repair.[1,2] These materials are biocompatible, radiolucent, and load sharing, as they incrementally transfer load to surrounding bone during the resorption process.[3,4] Despite the apparent advantages, the enthusiasm for polyglycolic and poly-L-lactic acid in the shoulder for labral tears and rotator cuff repairs as well as for fracture fixation has waned as surgeons have become aware of the potential for foreign body reactions.[5–10]

Anchors made of polyglycolic acid have fallen out of favor as numerous reports of foreign body reaction have been published over the last 20 years. These reactions occurred in the first few months following implantation as the anchors resorbed. As a result of the reactions to polyglycolic acid, surgeons came to prefer poly-L-lactic acid anchors. With slower hydrolytic degradation, over 20 to 32 months, the probability of a reaction is decreased.[11] The rate of resorption is highly dependent on the material properties of the anchor material, including its starting molecular weight, crystallinity, and porosity.[4] However, reports of foreign body granulomatous reactions to poly-L-lactic acid have been documented months to years after anchor placement.[5,7–9]

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CASE REPORT

A healthy, 50-year-old woman experienced an acute scapholunate ligament dissociation that was confirmed by magnetic resonance imaging (MRI). A primary repair of the scapholunate ligament was performed. The dorsal portion of the scapholunate ligament was avulsed from the lunate and was reattached with two 2.3- × 5-mm poly-L-lactic acid suture anchors, one proximal and one distal. The repair was reinforced with two 1.1-mm (0.045-inch) K-wires across the scapholunate and scaphocapitate joints. The pins were removed at 5.5 weeks, and the patient completed a total of 8 weeks of immobilization in a short arm thumb spica cast. At 8 weeks, she began hand therapy while continuing to wear a forearm-based thermoplastic wrist splint for protection. By 3.5 months, the protective splint was discontinued, and the patient was permitted unrestricted activity. She had regained 60° of wrist flexion and 65° of extension with full supination and pronation. She returned to tennis with light hitting restrictions by 4 months after surgery. At this time, she had painless motion from 65° of extension to 70° of flexion.

At 11 months after surgery, she complained of increasing dorsal wrist pain. The pain became disabling by 12 months, particularly with golf and tennis. Repeat x-rays and MRI revealed a severe inflammatory synovitis with particulate debris and multi-focal chondral erosions in the midcarpal joint (Fig. 1). A rheumatologic work-up was negative.

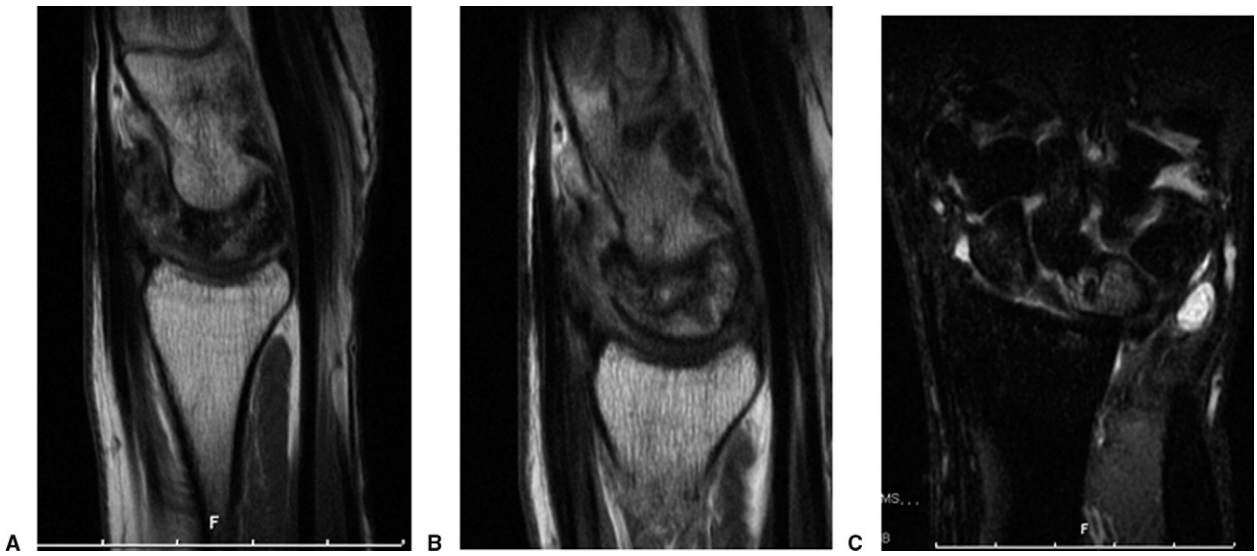

FIGURE 1: A, **B** Sagittal proton density and **C** coronal inversion recovery sequence MRI images through the lunate show a heterogeneous signal in the body of the lunate consistent with foreign-body reaction. There is also marked synovitis and effusion.

The patient continued to complain of pain over the next 6 months, with no clear cause recognized for her pain and synovitis. At this time, radiographs revealed a lytic lesion in the lunate, suspicious for a foreign-body reaction (Fig. 2).

Intraoperative findings at 21 months following the initial repair included a major effusion with 2 large fragments of anchor material in the midcarpal joint. The anchor remnants were largely unaffected by the hydrolytic process. One fragment was in the capitolunate joint, and a second fragment was near the dorsal rim of the lunate. These fragments appeared to be from the same anchor (Fig. 3).

The repaired dorsal scapholunate ligament appeared to have healed, as a stout band of tissue was observed connecting the scaphoid and lunate. Full-thickness chondral loss was noted over the head of the capitate, with sparing of the radiolunate and radioscaphoid articulations (Fig. 4). Pathology from the debridement and synovectomy showed sclerotic synovium with a focal granulomatous reaction to a birefringent material (Fig. 5). This type of reaction is characteristic of the foreign body reactions reported from poly-L-lactic acid implants in other anatomical sites.[5,7,8,10]

Following removal of the suture anchor debris and synovium, the patient returned to her normal activities. Three months following exploration, she returned to golf. Her wrist motion was 60° of extension and 55° of flexion, with full supination and pronation. At 5 months after surgery, the patient's activity-related pain had resolved.

DISCUSSION

Suture anchors have provided a major benefit in terms of strength and stability in acute scapholunate ligament repairs.[12,13] Biomechanical studies have demonstrated the pullout strength necessary for stable repairs.[14,15] Recent advances include the development of bioabsorbable suture anchors. These anchors are frequently manufactured from poly-L-lactic acid or polyglycolic acid. These materials are degraded by hydrolysis to natural metabolites, which theoretically prevent foreign-body reactions.[4] Surgeons who manage complex shoulder instability or rotator cuff pathology have recommended bioabsorbable suture anchors over traditional metal anchors.[15]

As mentioned earlier, there are a number of advantages over traditional metal anchors, including radiolucency, biocompatibility, and limited stress shielding.[3] A few case series have described the benefits of these suture anchors over traditional repair methods.[2,10,15] However, case reports in the shoulder and trauma literature have documented complications from bioabsorbable anchors, including recurrent pain, intraosseous granulomas, foreign-body reactions, synovitis, chondral lesions, and osteolysis.[5–8,10,16,17]

Bostman reported 3- to 9-year follow-up on bioabsorbable implants used in malleolar fractures.[18] Of 1,221 patients, 74 (6%) demonstrated a foreign-body reaction to bioabsorbable implants made from polyglycolide, polylactide, or glycolide-lactide. Of the 74 patients, 10 patients developed severe ankle osteoarthritis, despite there being no evidence of incongruity of the articular surface. The polymeric debris from the bioab-