Pisotriquetral Arthrodesis as an Alternative to Excision for Pisotriquetral Instability in High-Demand Patients: A Case Report in a Gymnast

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A gymnast developed ulnar wrist pain caused by pisotriquetral instability. Pisotriquetral arthrodesis resulted in pain relief and sufficient functional return to allow her to return to gymnastics. Pisotriquetral arthrodesis is a feasible alternative to pisiform excision worth consideration in high-demand patients with symptomatic pisotriquetral instability or arthrosis. (J Hand Surg 2006;31A:611–614. Copyright © 2006 by the American Society for Surgery of the Hand.)

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The pisotriquetral joint (PTJ) is anatomically complex. The pisiform is the attachment for the flexor carpi ulnaris (FCU), abductor digiti minimi, pisometacarpal ligament, pisohamate ligament, and ulnar collateral ligament.[1] It also serves as an insertion for the flexor retinaculum and forms part of the ulnar border of Guyon's canal.

Pisotriquetral joint pathology is a common source of ulnar-sided wrist pain.[2–4] Pain can occur acutely after trauma or dislocation[5] or chronically from PTJ arthrosis or tendinopathy at the FCU insertion.[6] Trail and Linscheid[7] recommend local anesthetic and steroid injection as both a diagnostic and therapeutic test for symptomatic PTJ pathology. When PTJ pain is unresponsive to nonsurgical intervention a subperiosteal excision of the pisiform bone customarily is performed, generally with good clinical results.[2,8–10] In high-demand patients, however, we were concerned that wrist flexion weakness would occur when the FCU insertion was removed.[2] We speculated further that the pisiform's protective effect on the ulnar neurovascular bundle during palmar contact would be lost after excision of the pisiform.

We present a case report of a gymnast who developed pisotriquetral instability in whom a pisotriquetral arthrodesis resulted in sufficient pain relief and return to gymnastics. We discuss a potential pitfall of the procedure that may account for residual symptoms.

Case Report

A healthy 14-year-old girl developed instability of the right PTJ after a gymnastics accident. Wrist radiographs taken after the injury were normal. The patient had sustained several less-severe injuries in the same location over the prior several years, but they had not been disabling. At the time of this current injury she developed considerable swelling but no ecchymosis. She was treated initially at another institution with splinting and nonsteroidal antiinflammatory agents without lasting relief. When trying to resume her tumbling activities she would experience severe ulnar-sided wrist pain. Other activities such as writing elicited palmar-ulnar pain caused by pressure over the pisiform.

We saw the patient 5 months after her injury. Physical examination localized the pain to the PTJ. Pain was elicited by hyperextension loading and radioulnar translation of the pisiform on the triquetrum. There was increased PTJ laxity on the involved side with radial and ulnar manual translation of the pisiform. A PTJ local anesthetic and corticosteroid injection provided temporary relief. We continued conservative treatment and the patient wore a cast for 1 month. Although she was

more comfortable immediately after cast removal within 2 weeks she was back to her status before the period of immobilization. Subsequent splinting provided minimal relief. Treatment options were discussed at length including the unconventional but logical option of pisotriquetral arthrodesis. After much deliberation she and her family elected to proceed with pisotriquetral arthrodesis, which was performed 10 months after injury.

Surgical Procedure

Examination under general anesthesia showed the ability to subluxate the pisiform passively more than 50% of its width as seen on fluoroscopic stress views.

A 5-cm incision was made over the proximal ulnar aspect of the hand and wrist, with the pisiform at the center. The portion of the incision distal to the wrist crease coincided with the junction of dorsal and glabrous skin, and the portion proximal to the wrist crease paralleled the dorsal border of the FCU. The incision was carried down to the fascial layer. Flaps were elevated dorsally and palmarly, exposing the palmar aspect of the pisiform and the fascia over the PTJ. The ulnar insertion of the dorsal wrist retinaculum overlying the PTJ was incised and the joint was exposed. No erosions, fibrillations, or loose bodies were noted but synovitis was present. A curette was used to denude the cartilage from the pisiform and triquetrum down to the cancellous bone. Under both direct and fluoroscopic vision a 1.1-mm guidewire was placed from palmar to dorsal through the pisiform into the triquetrum. After drilling and tapping with cannulated instruments a 3.0-mm cannulated screw (Synthes, West Chester, PA) then was lagged through a buried threaded washer across the PTJ. The wrist was splinted until suture removal at 10 days and a short-arm cast was applied for 2 months. After removal of the short-arm cast the patient was placed in a removable wrist splint for an additional month, at which time she showed radiographic union (Fig. 1).

Figure 1. (A) Anteroposterior and (B) lateral radiographs of the patient's right wrist after pisotriquetral arthrodesis.

Results

At the 6-month follow-up evaluation the patient reported no pain. Wrist range of motion was symmetric. By 1 year after surgery she had returned to full activities including cheerleading with tumbling gymnastics. At the final follow-up evaluation 2 years after surgery, she remained pain-free at the pisotriquetral arthrodesis site and over the pisiform; however, she had developed a painful popping sensation over the volar-ulnar aspect of the wrist that was brought on only by extreme wrist flexion coupled with forearm rotation. Although this was nowhere near as painful and dysfunctional as the preoperative