CONSULTATION CORNER

A Pisiform Fracture

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Case Report

A 19-year-old college student slipped and fell on ice onto his outstretched right dominant hand. The patient noted the acute onset of severe pain localized to the ulnar-volar aspect of his right wrist. He was taken immediately to the emergency room. A roentgenographic examination of the wrist was interpreted as normal (Fig. 1). He was told that he had sprained his wrist and that he should rest his arm. One week following the injury, the patient complained of an exacerbation of the pain after continued use.

The patient identified the proximal hypothenar eminence as the site of his pain. Volar flexion and ulnar deviation of the wrist reproduced his discomfort most accurately. Radiographic examination was repeated and oblique views demonstrated a non-displaced fracture of the pisiform (Fig. 2). The patient’s wrist was casted in a position of function with marked relief of the pain.

Discussion

Volar wrist pain is often an ill-defined and confusing diagnostic problem for the practitioner. A history and physical examination emphasizing a systematic approach to the wrist is the mainstay in the

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Fig. 1A: Anteroposterior view of the patient’s right wrist upon initial presentation.
diagnosis of wrist complaints. Tenderness over the hypothenar eminence localized the problem to the ulnar aspect of the wrist. The differential diagnosis of pain in this area includes carpal fracture, tenosynovitis of the flexor carpi ulnaris (FCU), carpal ligamentous disruptions, distal ulnar impingement syndromes, triangular fibrocartilage complex injuries, and degenerative arthritis.

Fractures of the pisiform, chondral injuries, or degenerative disease of the pisotriquetral joint can usually be identified by the tenderness elicited with isolated motion of the pisiform on the fixed triquetrum. Tendinitis of the FCU is identified by tenderness to direct palpation at the insertion of the FCU into the pisiform and pain with resisted wrist volar flexion. Relaxing the FCU does not resolve the symptoms; the distal tendon is tender to palpation in both volar flexion and dorsiflexion. A fracture of the hook of the hamate is indicated by tenderness distal
Fig. 2B: The patient’s right wrist supinated 20° from the lateral.

Fig. 2C: AP view in ulnar deviation.

and radial to the area of the pisiform, but this may be confusing because the patient may complain of pain referred to the dorsal aspect of the wrist. The triquetrum is palpable distal to the ulnar styloid with the wrist in radial deviation. A painful or audible snap while pressing on the triquetrum is highly suggestive of an injury to the lunotriquetral ligament with resultant wrist instability.

If, as in our patient, the physical examination suggests a pisiform injury, the standard AP and lateral wrist films should be supplemented with a carpal tunnel view and a lateral view of the wrist, supinated approximately 20° from the neutral position to better visualize the area. The film should be scrutinized for signs of carpal instability or fractures of the other carpal bones as well as the pisiform.

An understanding of the anatomy is useful in understanding both the injury and the treatment. The pisiform is the only carpal bone that receives a direct tendinous insertion. The tendon of the FCU inserts primarily into the volar aspect of the pisiform and
continues distally as the pisometacarpal ligament to the bases of the fourth and fifth metacarpals and via the pisohamate ligament to the hook of the hamate. The pisohamate ligament forms the roof of Guyon’s canal which houses the ulnar nerve and artery. This accounts for the relatively common occurrence of ulnar nerve symptoms with pisiform injuries. The pisiform, functioning in a way similar to the patella, moves the line of force further from the center of rotation of the wrist, thus increasing the moment arm of the FCU.

Most pisiform fractures are nondisplaced, although they frequently demonstrate intra-articular extension. Treatment should consist of cast immobilization for approximately 4 weeks. While nonunion and painful union is rare, persistence of pain in the pisotriquetral area may indicate post-traumatic arthritis or chondromalacia, a loose cartilaginous or osteocartilaginous fragment in the joint, or subluxation of the pisiform on the triquetrum. The normal pisotriquetral articular gap seen on a lateral film in wrist extension is 3 mm or less. Widening suggests the disruption of the joint capsule or presence of a loose body within the joint. The articular surfaces of the pisiform and triquetrum on the lateral wrist film in extension may normally diverge as much as 50°. Values greater than this suggest joint disruption.

Symptomatic nonunion, post-traumatic arthritis or chondromalacia of the pisotriquetral joint should be first treated with intra-articular steroid injection and possibly non-steroidal anti-inflammatory medication. Failure of non-surgical therapy may lead to pisiform excision.

Palmieri, in 1982, described his experience with 33 patients with pain in the pisiform area. The author performed subperiosteal excision of the pisiform in a group of 21 patients who were not responsive to non-surgical treatment. The group consisted of 5 patients with previous fractures, 6 patients with pisotriquetral arthritis, and 10 patients with FCU tendonitis. Nineteen of these patients (90%) had symptomatic relief with a follow up of one to 10 years.

Carroll and Coyle in 1985 described their experience with pisiform excision in 67 wrists (66 patients). Forty-two of their patients had a previous history of fracture. At surgery, osteoartritic changes were seen in 20 joints and chondromalacia of the pisotriquetral joint in 29 patients. Complete symptomatic relief was obtained by pisiform excision in 65 wrists without loss of wrist strength or range of motion. The authors also note a lack of postoperative problems with the FCU tendon.

References

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