December 2012 Case Study

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Title: Atypical Wrist Pain in a Female Gymnast

HPI:
15 year-old female presents with 10 day history of insidious-onset of intermittent, aching left wrist pain, worse with tumbling and specifically performing back handsprings. She is a LEVEL 5 gymnast and practices 3 days per week for 3-4 hours per day. She reports limited range of motion of the left wrist – with inability to lift her wrist fully. She reports minimal pain at rest. She reports exacerbation in pain with activity and pushing herself upright from a seated position. She has used an elastic bandage, occasional ice and NSAIDs with little improvement in her pain. She denies swelling, numbness, locking or catching. She has not had any prior history of wrist injury in her left wrist. She denies other joint pain, rashes, fevers, or chills.

PMHx: Asthma, Allergic Rhinitis, Hirsutism, Oligomenorrhea

ROS: Noncontribitory – She denies menstrual irregularities. She has no history of stress fractures. No history of prednisone bursts for asthma.

FHx: Mother hypertension and father with hypertension and type II diabetes.

Social Hx: 11th grade, denies tobacco exposure, diet – no restrictions, well-rounded diet.

Medications: Albuterol prn, Flonase 50mcg/act 2 sprays each nostril daily, Loratidine 1 tab PO daily, Norgestimate-ethinyl estradiol 0.25-35 mg-mcg 1 tab PO daily

Allergies: NKDA

Physical Examination:
Vitals: Height 167.6 cm (78.78%ile based on CDC 2-20 Years stature-for-age data), weight 61.236 kg (76.18%ile based on CDC 2-20 Years weight-for-age data), body mass index is 21.79 kg/(m^2). 66.99%ile based on CDC 2-20 Years BMI-for-age data.

General: Alert, well developed, well nourished, in no acute distress

Neurologic: Normal sensation to light touch, normal tone

Skin: Skin intact, no lesions identified

Musculoskeletal- Left wrist/hand:
Inspection: normal alignment, no swelling, no atrophy.

Palpation: Tenderness over the radial aspect of the volar surface of the wrist just distal to the radiocarpal joint.

Range of Motion: normal except for decreased wrist extension to 45 degrees, with pain reported in wrist extension and notable difference between active and passive extension. Strength: 5/5 in all directions
Special tests: Finkelstein test negative, Watson’s test negative.

**Differential Diagnosis:**
- Distal radial stress fracture
- Kienböck's disease
- Scaphoid impaction
- Lunate impaction
- Distal radial epiphysitis (gymnast wrist)
- Scaphoid stress fracture
- Carpal chondromalacia
- Dorsal impingement
- Capsulitis
- Triangular Fibrocartilage Complex Tear
- Ganglion cyst
- Carpal instability
- Osteoid osteoma
- Osteoblastoma
- Juvenile Idiopathic Arthritis
- Carpal tunnel syndrome
- Madelung Deformity

**Imaging:**
X-Ray: Left Wrist AP/lateral Views: Focal area of sclerosis within capitate.
MRI Left Wrist: Intraosseous cystic lesion measuring 5x8x3.5mm within capitate which communicates with extraosseous portion near narrow stalk adjacent to articulation of trapezoid. Second lobulated and septated cystic abnormality in region of pisiform extending to ulnar styloid.

**Final/Working Diagnosis:**
Intraosseous ganglion vs. dorsal impingement

**Treatment:**
The patient was referred to an orthopedic hand surgeon for further evaluation of the intraosseous process and treatment options given the nature of her sport. She utilized an ACE wrap, over-the-counter (OTC) analgesics, and rest prior to her orthopedic evaluation. After surgical evaluation, it was recommended that the patient use lion/tiger paws for gymnastics, continue OTC analgesics and follow up in orthopedic clinic in 2 months if pain continued. The discussion of carpal bone curettage was presented as an option should her pain continue at the two month mark.
Outcome:
The patient followed recommendations for conservative therapy. At the time of this write-up, she has not returned to gymnastics. Her pain has continued daily, again worse with activity and pushing up from a seated position. Her parents plan to schedule a follow-up appointment with the orthopedic surgeon.

Discussion:

Typical Causes of Wrist Pain in the Gymnast:

Wrist pain in the adolescent gymnast is common in all levels of gymnastics. More than 50% of beginning to midlevel gymnasts report wrist pain at some point in training, with dorsal wrist pain making up the vast majority of complaints. Gymnastics subjects the wrist to a wide array of dynamic and static forces with repetitive wrist extension during weight bearing likely the biggest factor in the development of chronic wrist pain. These activities include handstands, floor exercises, balance beam (female gymnastics), pommel horse (male gymnastics) and the vault.

The most common site for wrist pain in the gymnast is the distal radial physis – particularly important in the skeletally immature gymnast. Diagnoses include distal radial epiphysitis, Madelung deformity (premature closure of ulnar side of distal radial physis), complete physeal arrest, and fracture. Reports of positive ulnar variance are described (when the length of the distal ulna exceeds the length of the distal radius by 1 mm or more) in the literature. However, data showing a relationship between wrist pain and positive ulnar variance is lacking.

Dorsal Impingement
Characterized by dorsal capsulitis or synovitis, dorsal impingement represents another overuse injury in gymnasts. Pain is often localized along the distal border of the radius and carpal bones. In chronic cases, osteophytes may arise from the dorsal rim of the radius, scaphoid or lunate. Most cases resolve with splinting, rest and NSAIDs. In severe cases arthroscopic surgery may be necessary for osteophyte debridement and/or posterior interosseous nerve excision.

Intraosseous Ganglion Cyst
Most commonly reported to be located in the epiphyses of long bones, intraosseous ganglion cysts are rarely reported in the literature as a cause of wrist pain. The etiology of intraosseous ganglion cysts, although not completely understood, is believed to involve degenerative bone changes vs. traumatic penetration. These lesions involve invasion of cancellous bone by adjacent synovium. Treatment of such lesions is also poorly described with case reports indicating success with cyst excision, curettage, and bone grafting vs. injectable calcium phosphate bone cement.

References: