

Examination of the Wrist: Radial-Sided Wrist Pain

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ETIOLOGY OF RADIAL-SIDED WRIST PAIN

Radial-sided wrist pain may be due to an acute fracture or fracture non-union, articular degeneration, ligamentous injury or tendinopathy. Diagnosis is made by obtaining a detailed history and performing a clinical examination with focused attention to provocative tests, followed by directed imaging and, occasionally, wrist arthroscopy.

Alan Apley instilled the importance of following the principles of *look, feel, move* to British and American orthopedic surgeons, a discipline that has proved invaluable for decades.

EXAMINATION OF THE RADIAL SIDE OF THE WRIST

The patient and examiner must both be seated comfortably with an appropriate table to provide support to the patient's upper limb (Fig. 1). A careful, yet efficient visual inspection for soft tissue or bony deformities as well as evidence of previous injury or surgery is undertaken of both extremities.

The wrist is examined with a systematic approach (Table 1) allowing a thorough examination of the radial aspect of the wrist (Fig. 2). Asking the patient to point to the area of greatest discomfort and initially avoiding this area allows the patient to gain the

examiner's confidence. Comparison of the injured side with the uninjured contralateral side can be extremely helpful.

We describe clinical examination techniques to help diagnose the most commonly encountered conditions (Table 2). Provocative maneuvers supplement the clinical examination in order to obtain the correct diagnosis. There are many potential sources of radial wrist pain such as Wartenberg syndrome, FCR tendinitis, and radiocarpal arthritis that are not covered here but may form part of a differential diagnosis.

FIRST CARPOMETACARPAL JOINT ARTHRITIS OR INSTABILITY

The examiner grasps the head of the first metacarpal and extends the thumb metacarpal while applying traction. Pressure is applied to the dorsal aspect of the base of the first metacarpal. In the case of osteoarthritis (OA), this reduces the subluxated thumb base (Video 1, available on the *Journal's* Web site at www.jhandsurg.org). A positive test is demonstrated by crepitus or pain (positive grinding test with grade 1 OA). In the case of instability this will demonstrate increased mobility compared with the contralateral side. This traction-shift test has greater sensitivity and specificity (67% and 100%, respectively) when compared with the axially loading grind test (30% and 97%, respectively).¹

SCAPHOTRAPEZIOTRAPEZOID JOINT ARTHRITIS

With the forearm and wrist in a neutral position the examiner applies gentle pressure to the scaphoid tubercle while radially and ulnarly deviating the wrist.

Pain may be caused by OA or instability of the STT-ligament complex. There may also be proximal dorsal pain in the scapholunate (SL) joint due to instability. Pain with radial deviation may be associated with STT arthritis or radiocarpal arthritis (primary or secondary to early scapholunate advanced collapse).

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FIGURE 1: Patient setup in the consultation room with the patient and examiner seated and the elbow supported on the examination table.

OCCULT SCAPHOID FRACTURE

The clinical scaphoid score can aid the clinician in diagnosing an acute occult scaphoid fracture in the presence of normal radiographs.² Scores due to tenderness in the anatomic snuffbox with the wrist in ulnar deviation (3 points) in addition to pain at the scaphoid tubercle (2 points) or with axial thumb compression (1 point) are added. A score of 3 or lower has a negative predictive value of 96%, making scaphoid fracture unlikely.¹

DE QUERVAIN DISORDER AND INTERSECTION SYNDROME

de Quervain disorder is sometimes seen as a swelling at the radial styloid. Several techniques have been described in order to clinically confirm de Quervain tenosynovitis. Eichhoff described our preferred technique, often misrepresented as the Finkelstein test,^{3,4} whereby the examiner asks the patient to gently grasp their thumb in their palm and then the examiner passively ulnarly deviates the wrist (Fig. 3).⁵ Reproduction of the patient's symptoms

TABLE 1. Anatomic Structures That Are Palpated as Part of the Radial Wrist Examination Technique

1. Base of first metacarpal
2. Carpometacarpal joints 2–3 for carpal bossing
3. Anatomic snuffbox with the wrist in ulnar deviation*†
4. First extensor compartment
5. Radial styloid
6. Intersection area, the first and second extensor compartments (on radial aspect, not palmar)
7. Lister tubercle
8. Dorsoradiocarpal joint at scapholunate interval*
9. Scaphoid tubercle*
10. Radioscaphocapitate ligament

*A suspected scaphoid fracture must be palpated at each of these areas.

†The floor of the anatomic snuffbox consists of the base of the first metacarpal, trapezium, scaphoid, and tip of the radial styloid when the wrist is in ulnar deviation.

confirms a positive result, but it is essential to compare to the normal contralateral side, as this test may be uncomfortable in a normal wrist.

The Wrist Hyperflexion and Abduction of the Thumb test is a dynamic test that isolates the tendons within the first extensor compartment.⁶ With the wrist maximally flexed, the patient is asked to abduct their thumb against resistance by the examiner (Fig. 4). A positive test reproduces the patient's symptoms. With a sensitivity of 0.99 and specificity of 0.29 this test may allow the clinician to more accurately diagnose de Quervain disorder than using the Eichhoff test alone (sensitivity 0.89, specificity 0.14).⁶

Intersection syndrome presents with pain, swelling, and crepitus on the radial side of the wrist where the muscle bellies of abductor pollicis longus and extensor pollicis brevis, respectively, cross over the tendons of extensor carpi radialis longus and brevis. Alternatively, this condition is thought to be due to entrapment of the second extensor compartment.⁷ This area is approximately 4 cm from the wrist, more proximal and dorsal than the area affected by de Quervain tenosynovitis. Pain is elicited in this area with resisted wrist extension.

SCAPHOID COMPETENCY TEST FOR SL LIGAMENT INSUFFICIENCY/TEAR

This test is commonly known as the Watson test and is performed to detect insufficiency/tear of the SL ligament.⁸ With the forearm and wrist in a neutral position the examiner gently places their thumb over the scaphoid tubercle and index finger of the same hand at the SL interval on the dorsum of the

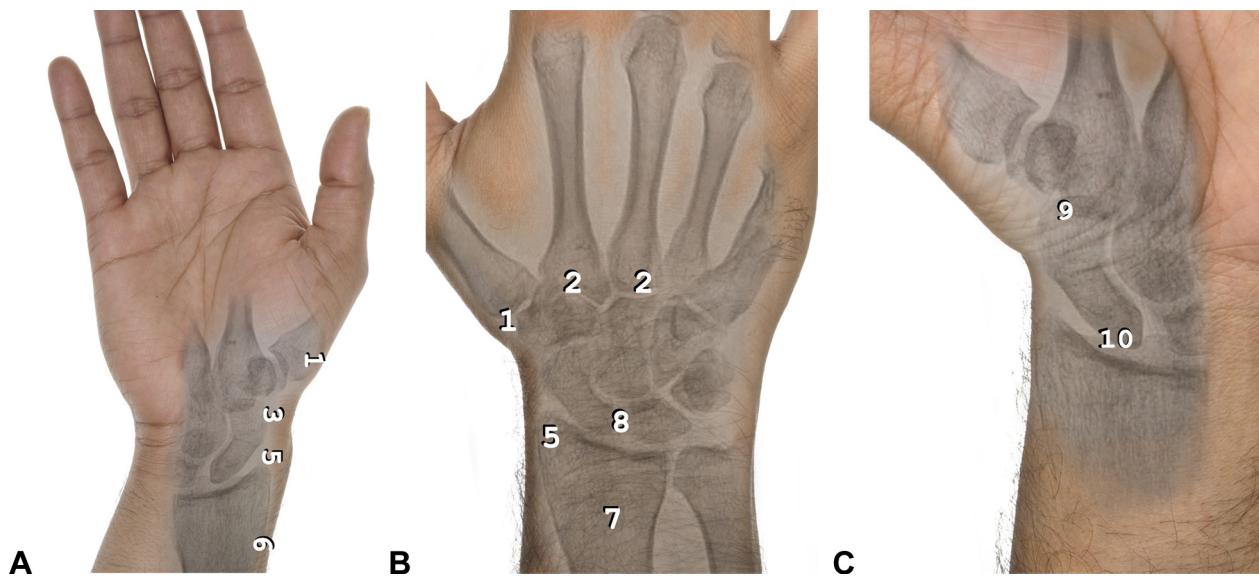


FIGURE 2: Anatomic landmarks for palpation of the wrist. **A** Radial aspect. **B** Dorsal aspect. **C** Palmar aspect.

TABLE 2. Differential Diagnoses for Radial-Sided Wrist Pain

- Thumb base (carpometacarpal joint 1) osteoarthritis
- STT joint arthritis
- Scaphoid fracture
- Scaphoid fracture nonunion
- Occult ganglion
- de Quervain tenosynovitis
- Intersection syndrome
- Scapholunate ligament insufficiency
- Radioscaphoid capitate ligament injury
- Wrist osteoarthritis
- SLAC/SNAC wrist
- FCR tendinitis
- Wartenberg syndrome

SLAC, scapholunate advanced collapse; SNAC, scaphoid nonunion advanced collapse; FCR, flexor carpi radialis.

radiocarpal joint, thus wrapping the examining hand around the radial side of the patient's wrist (Video 2, available on the *Journal's* Web site at www.jhandsurg.org). Confirm correct placement of the thumb by gently moving the patient's wrist from ulnar to radial deviation using your other hand. You should feel the scaphoid flexing towards your thumb as the wrist moves into radial deviation. Gradually increase the pressure on the scaphoid tubercle with your thumb. If there is disruption of the SL ligament, the lunate will push the unrestrained proximal pole of the scaphoid dorsally. This may be palpated as a click with your index finger or experienced as pain by the patient (sensitivity 48%, specificity 67%).⁹



FIGURE 3: Eichhoff test.

The SL shear test may also be used to fine-tune pathology at the SL interval. With the wrist in a neutral position, the lunate and scaphoid are balloted between the finger and thumb by pressure over the dorsum of the lunate and over the scaphoid tubercle on the volar surface. A positive test occurs when there is excessive movement and/or when substantial pain occurs.¹⁰

RADIOCAPITATE TEST

Rotatory instability of the radio-scaphoid joint due to radio-scaphoid-capitate ligament injury (Mayfield grade 1) is tested by holding the radius and scaphoid tubercle. First perform a Watson test and then move the thumb to the distal radius. Next, bring the wrist into maximum ulnar deviation and then dorsiflex and extend the scaphoid in a rotatory fashion (Video 3, available on the *Journal's* Web site at www.jhandsurg.org). A positive test reveals increased translation of the joint, as opposed to the contralateral



FIGURE 4: Wrist hyperflexion and abduction test.

side, similar to the scaphoid competency test described above but without a dorsal click, only palmar pain. Arthroscopy serves as the gold standard to confirm this condition.

Radial-sided wrist pain is a common presentation to the hand and wrist clinic. A well-taken history combined with a systematic examination will identify the diagnosis in the majority of cases. Hence, a detailed examination is essential to determine further appropriate management of the patient's symptoms.



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