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IDENTIFYING MILD SLL INJURIES

by Karol S. Young OTD, OTR/L, CHT

The scapholunate ligament (SLL) is the most commonly injured intercarpal ligament. The SLL injury can occur in isolation or may be injured along with a distal radius fracture (DRF) resulting from a fall on the outstretched hand. While extensive SLL injuries can be identified on x-rays, smaller, more isolated SLL lesions can be difficult to identify and thus may go undetected. When we are treating a patient referred with undiagnosed wrist pain or following a DRF, how can we identify SLL injuries early so they do not become more extensive and/or more painful?

Traditional SLL Evaluation

The scaphoid shift test, or Watson's test, attempts to manually sublux the scaphoid over the dorsal rim of the radius to detect SLL injuries. The test is considered positive if subluxation occurs and/or pain is elicited.



Scaphoid shift test: Click to watch

Research, however, shows the validity of the scaphoid shift test varies:

- Findings by LaStayo et al. suggest a positive test warrants a more extensive work up.
- Prosser et al. classify the test as "mildly useful."
- In a sample of 100 uninjured wrists, Easterling and Wolfe found 32% had a positive test.

Thus, the literature suggests the scaphoid shift may not actually be a "test" and should be considered more of a "sign" as the diagnostic value depends on the severity of the SLL injury. Without a standard valid evaluation tool for SLL injuries, we must look for other ways to detect an SLL tear—especially those that are considered mild or may occur along with a DRF.

Treatment as Evaluation

When treating a patient with undiagnosed wrist pain or following a DRF, one often assumes the focus should be improving range of motion and strength, perhaps through range. Since all SLL tears are not easily identified by manual examination, it seems wise, instead, to begin by focusing on wrist stabilization exercises until it is clear whether there is an SLL injury. With the appropriate wrist stabilization exercises, proprioceptive feedback, and external bracing, pain localized to the SLL should diminish.

Exercise: Although range of motion and strength are important wrist functions, a stable, pain-free wrist is the primary goal. Therefore, to begin mobilizing a wrist with undiagnosed pain or a stiff wrist following a DRF, it is logical to start with exercises that also protect a potential SLL injury. These wrist stabilization exercises consist of isometric contraction of the extensor carpi radialis longus, extensor carpi radialis brevis, abductor pollicis longus, and flexor carpi ulnaris with forearm in pronation to minimize extensor carpi ulnaris muscle tension. A reduction of SLL symptoms with this stabiliza-

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tion program suggests you should progress your patient through the stabilization program first by exercising with the forearm in neutral and then in pronation. Exercises can also be progressed from isometric to isotonic. If these exercises increase the pain, consider using a wrist support during the exercises. A significant increase in pain requires further physician workup.

Proprioceptive Feedback: Enhancing proprioception plays an important role in wrist rehabilitation by improving the ability to achieve stable joint movements through effort and force control. A joint position sense test evaluates the patient's motor control and their awareness of active movement.

To test joint position sense:

1. Passively place the patient's wrist in 30 degrees of wrist flexion and have the patient hold the flexed position for 3 seconds.
2. Ask the patient to actively return their wrist to neutral.
3. Request the patient actively reproduce the position of 30 degrees of flexion.
4. Repeat the test for 30 degrees of wrist extension. *(See Figures 1 & 2, and Video)*

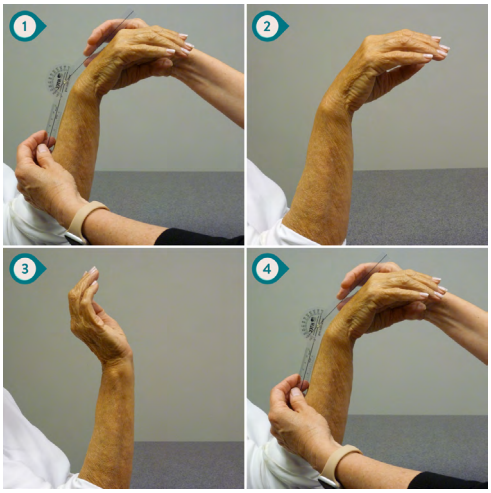


Figure 1: Passive wrist flexion to 30 degrees followed by a 3 second hold of that position. The patient moves the wrist out of the flexed position then reproduces the position of 30 degrees of flexion.

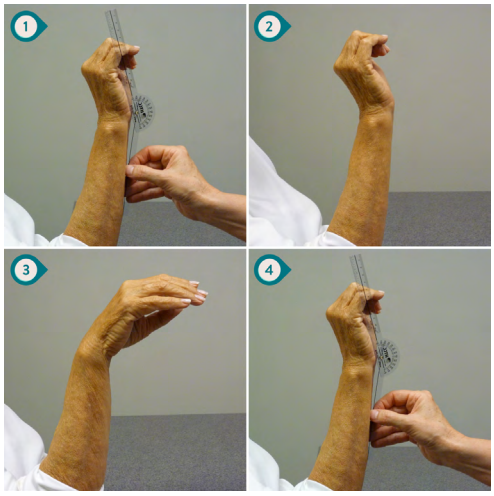


Figure 2: Passive wrist extension to 30 degrees followed by a 3 second hold of that position. The patient moves the wrist out of the extended position then reproduces the position of 30 degrees of extension.



Video: Click to watch

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A patient unable to reproduce the position of 30 degrees of wrist flexion/extension suggests wrist sensorimotor impairment. Practicing joint position sense with vision occluded, discriminating and manipulating containers or pill bottles of varying weights, and graded control of the strength of muscle contractions will teach an individual with a SLL injury to modulate motion and force through their injured wrist. A change in symptoms with this intervention will help determine or rule out the diagnosis of an SLL tear, and will direct the path of therapy.

External Bracing: For those with mild SLL injuries, using a wrist brace that specifically supports over the dorsum of the radiocarpal joint/SLL and blocks end range extension may provide meaningful pain relief. The ideal support allows mid-range wrist motion but prevents end range of motion, allowing the patient to improve active wrist stabilization during activities in mid-range motion.

Fear of wrist movement may also resolve with the appropriate wrist support. We have found the new Wristable® Wrist Brace *(Figure 3)* provides mid-range stability and blocks painful end range motion, improving functional wrist motion in those with mild SLL injuries. To our knowledge, this is the only wrist brace designed specifically for this purpose.



Figure 3: WriStable® Wrist Brace

The Future

With the advancement of technology such as four-dimensional Computed Tomography (4DCT) and cone-beam CT (CBCT), future CT scans will likely be able to evaluate joints while in motion or during weightbearing to determine mild SLL injuries. For now, assessment through judicious treatment may identify patients with a suspected SLL tear, preventing an undiagnosed, chronically painful condition.

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