Editorial

The Scapholunate Ligament Complex (SLLC)

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It has become clear that the stability of the scapholunate joint is not dependent wholly upon the scapholunate interosseous ligament (SLIL) but rather upon both primary and secondary stabilizers, which can be thought of as forming a scapholunate ligament complex (SLLC). Each case of SL instability is unique and therefore should be treated with tissue specific repairs, which may partly explain why one procedure cannot successfully restore joint stability in every case.

Elsaidi and Ruch sequentially divided the radioscaphocapitate (RSC), long and short radiolunate, the scapholunate interosseous ligament (SLIL), and finally the dorsal capsule insertion on the scaphoid,¹ with no appreciable change in the radiographic appearance of the wrist. When the dorsal radiocarpal ligament (DRCL) was then divided, a dorsal intercalated segmental instability (DISI) deformity occurred.² Short et al determined that the SLIL is the primary stabilizer of the SL articulation and that the DRCL, the dorsal intercarpal (DIC) ligament, the scaphotrapezium (ST) ligaments, and the RSC ligaments are secondary stabilizers.³ Dividing the DRCL alone only caused increased radial deviation of the lunate with the wrist in maximum flexion, whereas dividing the SLIL after any of the ligaments tested produced increased flexion and ulnar deviation of the scaphoid and lunate extension. The scapholunate joint stability is, therefore, dependent on a complex of ligaments, each having a separate role but working in concert.

Galley et al published paper on the influence of the lunate type on scaphoid kinematics.⁴ In a rotating scaphoid, the scaphotrapezium ligaments are distally based and form a "V" with a narrow scaphoid attachment, and the scaphocapitate ligament is long to allow pronation or supination. When there was a type I lunate with a single facet, there is statistically greater scaphoid translation with radial deviation. In a flexing lunate, the scaphotrapezium ligaments form a proximally based "V" with a broad scaphoid attachment, and the scaphocapitate ligament is short and along the axis of flexion. When there was a type II lunate with a double facet, there was statistically greater scaphoid flexion with radial deviation. Based on this work, one can surmise that different joint

kinematics would require a different type of reconstructive method. Following an injury, the patient with a type I lunate might develop rotational instability and, therefore, require a procedure that effectively limits scaphoid pronation such as a modified Brunelli, whereas the patient with a type II lunate might develop abnormal flexion of the scaphoid and therefore require a procedure that limits scaphoid flexion, such as a dorsal capsulodesis. Any given reconstructive procedure should be designed for one specific function rather than multiple functions, which may be a reason for failure in some cases. Rather than grouping procedures into those that provide sagittal plane stability versus those that provide coronal plane stability, it is preferable to consider the individual subcomponent(s) of the SLLC. The reconstructive procedures can be therefore grouped into those that stabilize the volar components of the SLLC (the palmar SLIL, RSC, ST ligaments), the dorsal components (dorsal capsule, dorsal SLIL, DRCL, DIC), and the interosseous component (SLIL). The dynamic protective role of the musculotendinous SL joint stabilizers should not be underestimated, as discussed in the Perspectives section by Dr. Garcia Elias.

This issue explores some of the standard, time-tested techniques for scapholunate joint reconstruction, in addition to a number of new and innovative reconstructive options that signal a change in the conventional thinking regarding the management of scapholunate joint instability.

References

- 1 Elsaidi GA, Ruch DS, Kuzma GR, et al. Dorsal wrist ligament insertions stabilize the scapholunate interval: cadaver study. *Clin Orthop Relat Res* 2004;152-7
- 2 Slutsky DJ. Incidence of dorsal radiocarpal ligament tears in the presence of other intercarpal derangements. *Arthroscopy* 2008;24:526-33
- 3 Short WH, Werner FW, Green JK, et al. Biomechanical evaluation of the ligamentous stabilizers of the scaphoid and lunate: part III. *J Hand Surg [Am]* 2007;32:297-309
- 4 Galley I, Bain GI, McLean JM. Influence of lunate type on scaphoid kinematics. *J Hand Surg Am* 2007;32:842-7

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