Recent Trends In Management of Scapholunate Dissociation

Essay

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Abstract

Scapholunate stability is dependent on the SLIL and extrinsic capsular ligaments. While division of the SLIL alone may not lead to any static changes in carpal position, there are significant changes in force transmission and kinematics of the scaphoid and lunate.

Key word

Scapholunate

Dissociation

Orthopedic

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List of Abbreviations

- 4CF ····· Four-corner fusion
- ARIF····· Arthroscopic reduction internal fixation
- CHR ····· Carpal height ratio
- CID ····· Carpal instability dissociative
- CLA ····· Capitolunate angle
- DICL ····· Dorsal intercarpal ligament
- DISI····· Dorsal intercalated segment instability
- DRC ····· Dorsal radiocarpal ligament
- DSLIL ····· The dorsal component of the SLIL
- LRLL ····· Long radiolunate ligament
- LT····· Listers tubercle
- LTIL ····· Lunotriquetral Interosseous Ligaments
- PCR····· Polymerase chain reaction
- PRC····· Proximal row carpectomy
- PSLIL ····· The palmar component of the SLIL
- RASL ····· Reduction and Association of the Scaphoid and Lunate
- RLA ····· Radiolunate Angle
- RSCL ····· Radioscaphocapitate ligament
- RSLL ····· Radioscapholunate ligament
- SCA····· Scaphocapitate angle
- SLA····· Scapholunate angle
- SLAC····· Scapholunate advanced collapse
- SLC····· Scapholunocapitate
- SLD····· Scapholunate dislocation
- SLIL ····· Scapholunate Interosseous Ligament
- SRLL ····· Short radiolunate ligament

- STT ····· Scaphoid–trapezium–trapezoid
- UTI ····· Ulnar translocation index
- VISI····· Volar intercalated segment instability

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Introduction

Wrist sprains and pain are a common complaint encountered by physicians treating musculoskeletal injuries. These injuries were poorly understood in the past, and some may have been subsequently left untreated[1]. But a careful history, physical examination, and radiographic evaluation along with a thorough understanding of the instability patterns and presentations will allow prompt, accurate diagnosis and institution of treatment[2].

The carpal ligaments are pivotal in the stability and kinematics of the wrist joint and an understanding of their anatomy is important for wrist injury reconstruction[3]. Injuries to these ligaments can alter the wrist kinematics, leading to instability and early post-traumatic degenerative arthritis[4].

The scapholunate ligament (SLIL) plays an integral role in the interdependence of the carpal articulation chain. Damage to the SL ligament leads to scaphoid instability, which creates a sequence of clinical disorders[5].

Scapholunate dissociation is defined as a loss of the normal relationship between lunate and scaphoid, secondary to a ligamentous injury with an initially reversible or reducible subluxation. This injury should be suspected in patients with wrist effusion and pain that is seemingly out of proportion to the injury[4, 6].

Trauma and synovitis are the principal causes of carpal ligament disruption[7].

Static and dynamic scapholunate instability can be distinguished on the basis of radiographic findings. In dynamic scapholunate instability, static radiographs demonstrate normal carpal alignment[1].

Most surgeons prefer an open dorsal approach for all injuries, with single or combined soft-tissue procedures (ligament repair, capsulodesis, tenodesis) for acute cases and more variable soft-tissue and bone salvage procedures (proximal row carpectomy or numerous limited intercarpal arthrodesis) for chronic cases. Recently, Arthroscopic reduction and percutaneous fixation of the carpus is a new and less invasive technique for managing intrinsic ligament injuries of the wrist which permit return to full activity within several months[2,8].

Aim of the Work

The aim of this essay is to review literature about recent trends in management of scapholunate dissociation.

Anatomy of Scapholunate Interosseous Ligament

Ligaments of the Wrist:

The ligaments of the wrist have the responsibility of balancing the constraints that are necessary to maintain stability while at the same time, allowing the generous range of motion that a healthy wrist joint enjoys[9].

Carpal Ligament Organization:

The carpal ligaments can be divided into several groupings that are defined by their location within the carpus and within the organization of the joint capsule. The capsular ligaments are defined as crossing the radiocarpal joint, the midcarpal joint, or both.

Designations are made regarding the dorsal or palmar location of the ligament. The short ligaments between the bones of either the proximal or distal carpal rows are called interosseous or intrinsic ligaments. Agreement exists in defining two categories of intracapsular ligaments, extrinsic and intrinsic[10, 11, 12, 13]. Extrinsic ligaments are those that connect the forearm bones with the carpus, and intrinsic ligaments are those that have both origin and insertion within the carpus. Anatomic, histologic and biochemical differences exist between the two types[11, 14, 15, 16].

Movement at the scapholunate joint is tightly controlled by the tough SLIL, which can be considered the primary restraining ligament, whilst the surrounding extrinsic ligaments act as secondary stabilisers. These secondary restraints include the volar carpal ligaments and dorsal capsule. The major volar restraints include the radioscapho-capitate (RSC), the long radiolunate (LRL), scaphotrapezial and the scaphocapitate ligaments. Important dorsal constraints include the DIC and DRC ligaments[17].

Scapholunate Interosseous Ligament:

Scapholunate Interosseous Ligament is one of Proximal Interosseous Ligaments (Intrinsic ligaments) and one of the most important intercarpal ligaments and it is essential for wrist stability[18].

Anatomy:

Destot[19] was one of the first to mention the existence of a ligament connecting the scaphoid and lunate in 1923 .This ligament, now referred to as the scapholunate interosseous ligament, is a C-shaped ligament that binds the scaphoid to the lunate on their proximal surfaces (Figure 1)[20].

As demonstrated by Berger [21], the so-called scapholunate (SLIL) interosseous membrane is formed by three distinct structures (Figure 1): the two SL ligaments (palmar and dorsal) and the proximal fibrocartilaginous membrane. The latter follows the arc of the proximal edges of the two bones from dorsal to palmar, preventing communication between the radiocarpal and midcarpal joint spaces[22]. The dorsal SL ligament is located in the depth of the dorsal capsule and connects the dorsal aspects of the scaphoid and lunate bones. Its anterior counterpart, the palmar SL ligament, is formed by longer and more obliquely oriented fibers, allowing substantial sagittal rotation of the scaphoid relative to the lunate [21, 22], while playing a minor role in carpal stability[22, 23].

The distal scapholunate joint is free of any ligamentous coverage resulting in a cleft that is visible when viewed during midcarpal arthroscopy. The SLIL is covered by a synovial stratum, isolating it from the intraarticular space [24, 25].