

SCAPHOLUNATE INSTABILITY FOLLOWING DORSAL WRIST GANGLION EXCISION: A CASE REPORT

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INTRODUCTION

Ganglions on the dorsum of the wrist have been shown to originate from the scapholunate joint, often with direct attachment to the scapholunate interosseous ligament (SLIL).¹ It has long been recognized that non-surgical techniques for the treatment of dorsal wrist ganglia are unreliable with a high recurrence rate. Surgical intervention is often necessary. It has been recommended that surgical excision of the ganglion should be accompanied by excision of a small cuff of surrounding dorsal joint capsule, and removal of all attachments of the ganglion to the SLIL that are thought to minimize recurrence rate.^{1,2} While excision of the dorsal carpal ganglion is a common operation performed on the wrist, carpal instability is rarely considered a complication of this surgery.

We present a case here of scapholunate instability occurring following excision of a dorsal wrist ganglion in a young patient. Surgeons should be aware of this complication. Obtaining preoperative radiographs of the wrist, not performed in this case prior to ganglionectomy, may help to rule out any pre-existing abnormality of the scapholunate joint.

CASE REPORT

A 23-year-old male environmental worker presented with a six-month history of a left dorsal wrist ganglion. He gave no history of pain or trauma, or any symptoms in his wrist aside from the general appearance of the wrist mass. He sought surgical removal of the dorsal ganglion. He underwent ganglionectomy at another center in June 1997, with an uneventful post-operative course. Three weeks after the operation, while he was playing table hockey, he had a mild twisting injury and experienced a painful pop in his wrist. Following this minor injury, he felt something move spontaneously in his wrist. He was seen by his hand surgeon, and was immediately referred to our center for further evaluation and treatment.

Active motion of the wrist was painful and accompanied by a click. A transverse well-healed scar was apparent on the dorsum of the wrist, with mild swelling and tenderness on the scapholunate joint. The range of motion of the wrist was limited, with dorsiflexion of 15° and palmar flexion of 60°. Pronation and supination of the forearm were within normal limits. The scapholunate ballottement test showed abnormal motion between the scaphoid and lunate bones, and was accompanied by pain at the scapholunate joint. The Watson test (scaphoid shift test) was painful and showed dorsal scaphoid displacement. The grip strength of his injured hand was one-third of the strength of the other hand. Radiographs of his left wrist showed evidence of scapholunate instability with a scapholunate interval of 15 mm, marked dorsal intercalated segment instability (DISI) deformity, a scapholunate angle of 110° and decreased carpal height (Figure 1).

He was subsequently treated with open reduction and ligamentous repair. This was performed one month after his ganglionectomy. Through a dorsal longitudinal incision, a Z-cut was made in the extensor retinaculum and the retinaculum was preserved for later reconstruction. The wrist capsule was approached between the third (extensor pollicis longus) and fourth (extensor digitorum communis) extensor compartments. A small rent was seen in the dorsal capsule from which synovium was expressed. A capsulotomy was performed

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Figure 1a.



Figure 1b.

Figure 1. Anteroposterior (a) and lateral (b) radiographs of the wrist, 4 weeks after ganglionectomy following trivial injury to the wrist.

just distal to the insertion of the capsule onto the distal radius. Following capsular retraction, carpal malalignment was clearly evident. The scapholunate interosseous ligament (SLIL) appeared to be completely disrupted with only minimal remnants left behind, rendering primary repair impossible.

Therefore, the surface of the scaphoid and lunate were roughened, and following exact reduction of the scapholunate joint, three Kirschner wires were inserted to maintain the reduction (Figure 2). The capsule, retinaculum and skin were subsequently repaired and the



Figure 2. Anteroposterior (a) and lateral (b) radiographs of the wrist following open scapholunate reduction and fixation.

wrist was immobilized in mild flexion. Six weeks later, the cast was removed and limited wrist motion was allowed in a removable splint. The pins were removed ten weeks after their insertion and range of motion exercises were prescribed. Radiographs obtained six months after the operation (Figure 3) showed normal scapholunate alignment.

A year after surgery, he complained of no pain and was completely satisfied with his operation and resumed all his previous activities. Physical examination of the wrist showed a stable carpus with a negative Watson test and no tenderness on the scapholunate joint. The range of motion of the wrist was normal, with grip strength of 76% compared to the contralateral normal hand.

DISCUSSION

Watson³ reported 25 patients with scapholunate instability following ganglion excision. Eight were found to have static instability, while the other 17 had either dynamic instability with a positive Watson test, or isolated arthritis of the scaphotrapezotrapezoidal (STT) joint on the radiographs (felt to be indirect evidence of scapholunate instability). Apart from this striking report, there have only been three other case reports documenting this in the literature. Clay and Clement⁴ evaluated 62 dorsal wrist ganglia following excision, and detected one case of scapholunate instability in their patients. Duncan⁵ reported the occurrence of



Figure 3. Anteroposterior (a) and lateral (b) radiographs of the wrist three months after open reduction and internal fixation of the scapholunate joint.

scapholunate instability following a minor twisting injury in a patient who had had his ganglion removed four months before this event. Finally, Crawford and Taleisnik⁶ reported a rotatory subluxation of the scaphoid after excision of a dorsal carpal ganglion and wrist manipulation. Apparently, the wrist in that case report was manipulated post-ganglionectomy to regain the loss of motion. The authors attributed the instability to the trauma imposed on the wrist during manipulation. In contrast, Kivett et al.⁷ found no case of scapholunate instability after having evaluated the post-operative results in 91 ganglion excisions.

While it has been suggested that scapholunate instability occurs only after injury to the SLIL and radioscapholunate ligaments (a magnitude of injury unlikely following routine ganglion excision), anatomical studies⁸ have revealed that the SLIL is the primary stabilizer of this joint. The relatively high tensile strength of the SLIL suggests the important role of this ligament in carpal kinematics. The SLIL has three distinct anatomical portions, of which the dorsal portion is considered the strongest,⁸ and is considered by Kauer,⁹ Ruby, and Linsheid¹⁰ to be the major stabilizer of the proximal scaphoid. They have shown experimentally that sectioning of the dorsal portion of this ligament, as can occur in radical ganglion excision, can create scapholunate instability in the wrist.

Although our present case had no radiographs before ganglion excision to document the status of the scapholunate interval, the absence of symptoms (except for the ganglion mass itself) before ganglion removal suggests a normal SLIL pre-ganglionectomy. The trivial injury to the wrist post-operatively while playing table hockey, and the brief interval between the ganglionectomy and the appearance of scapholunate instability suggest an iatrogenic primary cause for this instability complication. It is remotely possible that underlying myxoid degeneration of the periarticular wrist connective tissue could have pre-existed, thus pre-disposing to the formation of dorsal wrist ganglia. In that setting, of a possibly degenerative scapholunate ligament and status post a ganglionectomy with excess dorsal wrist capsule excision, it is plausible that an innocuous wrist injury could have caused the significant scapholunate diastasis. Regardless of the proximate cause, the management of acute SLIL instability is open reduction and anatomic reduction with pinning.¹¹

Considering our case and the literature, it seems prudent to avoid damage to the SLIL if at all possible during ganglion excision. The absence of preoperative wrist symptomatology does not guarantee a healthy and robust SLIL. At present, no clear risk factors can be identified to predict the potential complication of

scapholunate instability following ganglion excision. Further studies on scapholunate instability may identify the risk factors associated with this complication, which surgeons should be aware of.

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