

A Modified Blatt Dorsal Capsulodesis in the Treatment of Dynamic Scapholunate Instability

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Summary

We report a case of scapholunate dissociation which was initially missed and presented late. A modification of Blatt dorsal capsulodesis performed using dorsal intercarpal ligament (DICL) and extra tunnel appears not only to add to dorsal stability but also address the volar problem as well. This modification may be a better alternative to the current technique of using a single flap.

Key Words: Trauma, Scapholunate Dissociation, Dorsal Capsulodesis

Introduction

Scapholunate dissociation is often missed at first glance, and it is usually dismissed as wrist sprain or soft tissue injury¹. Failure to recognize the injury leads to instability of the carpus and often causes considerable morbidity to those affected. Due to the ligamentous injury of the intercarpal ligament, abnormal wrist motion may eventually lead to wrist arthritis or a scapholunate advanced collapse (SLAC) wrist². Dorsal capsulodesis has been recommended for this condition to avoid future morbidity. In this case we discuss a modified technique which has resulted in a good surgical outcome.

Case report

A 24-year-old right hand dominant male has his right hand crushed by a roller machine. He presented at the Emergency Unit wrist pain wound over the hand. No fractures were noted on plain radiographs. He was treated for the soft tissue injury and discharged with a below elbow back slab. On subsequent follow-ups, the wrist pain did not improve and was aggravated by gripping, opposing the thumb and extending the wrist.

He was only referred to the Hand and Microsurgical Unit after six months.

Clinical assessment revealed tenderness at the scapholunate region with decreased range of motion of the wrist from 40° dorsiflexion to 45° palmar flexion. Kirk Watson test and scapholunate ballotment test were positive. Scaphoid series showed the scapholunate angle to be 67° with an increase of scapholunate (SL) gap of 5 mm on clenched fist view (Figure 1).

Dynamic scapholunate instability surgery was performed using a dorsal wrist approach. Instability over the scapholunate junction was elicited, however SL ligaments were not clearly demarcated and the scapholunate space was found to be filled with fibrous tissue. A modification of Blatt technique was performed (Figure 2). The inferior half of dorsal intercarpal ligament (DICL) was mobilized from its scaphoid attachment. A bony trough that passed in a posteroanterior direction was created in the lunate and the scaphoid. The mobilized ligament was passed through the trough in the lunate and then the scaphoid, bridging the volar aspect of the SL gap. An anchor suture was inserted at the entry point (at the lunate).

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The remaining length was then passed over the dorsal aspect of the SL gap. Another anchor suture was inserted at the exit point with the free end sutured to the proximal part of the ligament (Figure 2b). The end ligament was then plicated on to the proximal part keeping the gap closed and the remaining ligament taut. The wrist was immobilized in a splint for two months but the wires were removed after three weeks.

Post operative radiographs showed reduction of SL gap interval (Figure 3). On follow-up six weeks after surgery patient did not complain of any pain of the wrist. Grip power improved from 5 kg to 7.5 kg at three weeks and 15 kg at six weeks. Six months after surgery, his range of motion and his grip strength was almost full and the pain had resolved. Patient was satisfied with the treatment and felt marked improvement from his pre-operative condition.

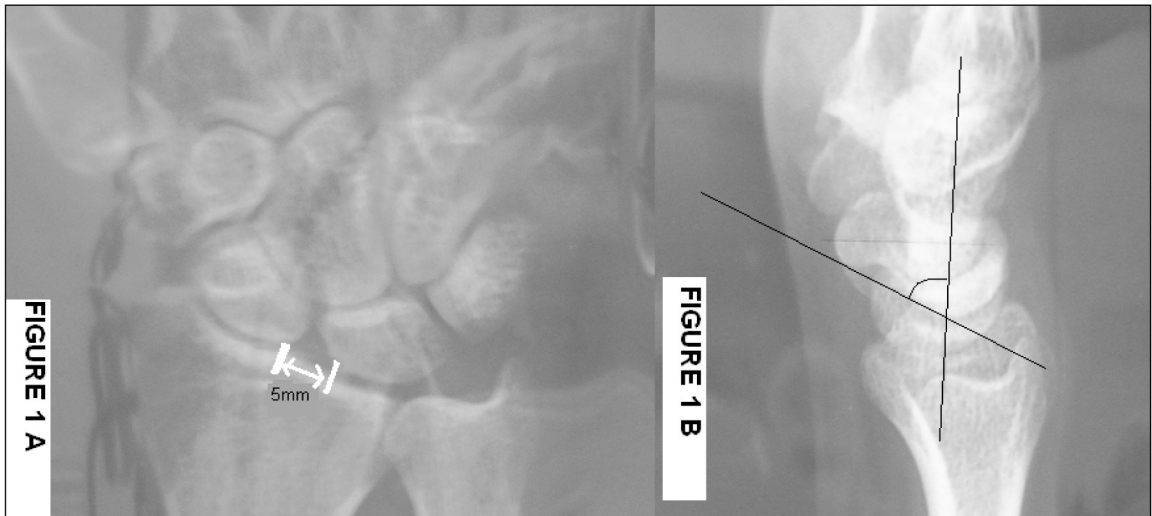


Fig. 1: AP (stress) view showing increased SL gap >5 mm; lateral - SL angle is 85° (DISI noted).

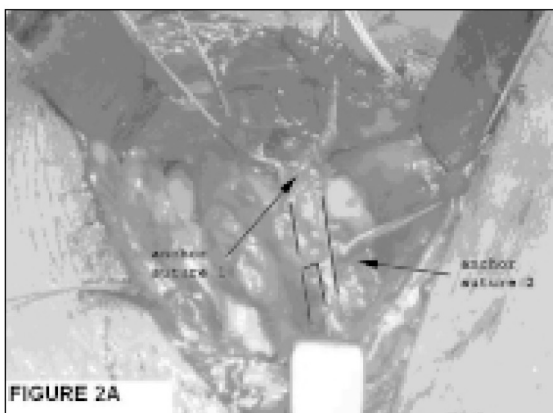


Fig. 2a: Anchor sutures used to anchor the mobilized ligaments to the bony trough at the lunate and scaphoid.

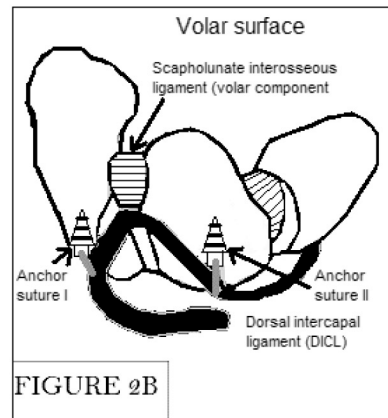


Fig. 2b: Diagram to show the bony trough and anchor sutures are placed. Note that not only the dorsal instability is addressed the stability of the centre and anterior portion of the SL ligament are also being augmented. Note that in most cases the volar SL ligament remains intact.

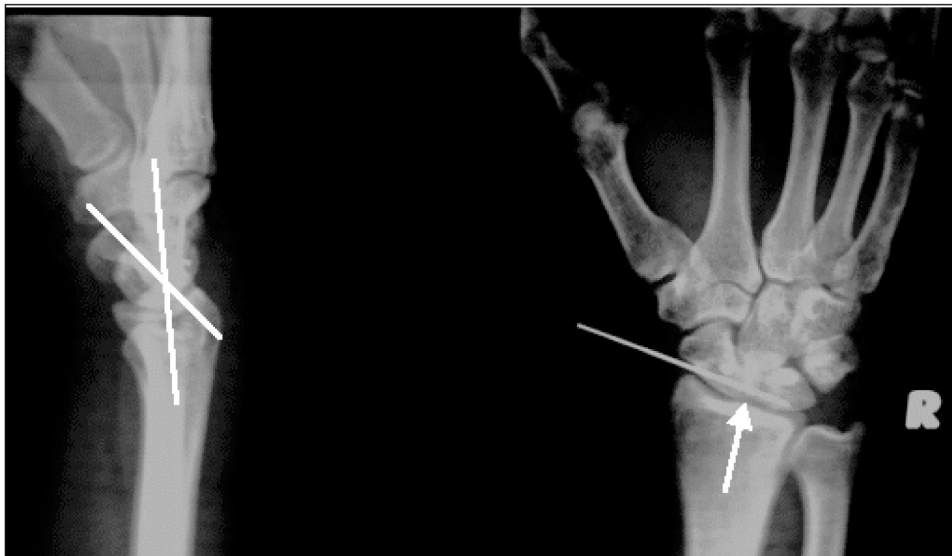


Fig. 3: Note the post operative X-ray with the SL gap reduced (arrow) and SL angle back to normal at 50° seen in the clenched fist view.

Discussion

Traumatic scapholunate injury is a debilitating problem^{1,2,5}. It is usually missed at the initial presentation and often dismissed as a wrist sprain¹. The importance of this injury cannot be over emphasized because the function of the hand is dependant on the relationship between the wrist and carpal bones and this is maintained mainly by the ligaments. The importance of the dorsal wrist ligaments in maintaining the scapholunate interval has been emphasized by a study by Gamal A *et al*. Disruption of the ligaments causes rotatory subluxation and palmar flexion of the scaphoid, resulting in awkward kinematics of the carpus. This in turn will lead to reduced grip strength and increase wrist pain. In this case, the diagnosis of dynamic scapholunate disassociation (SLD) was made based on the symptoms², clinical signs and also radiographic findings. Increased SL interval compared to the normal side on radiograph is diagnostic although the accepted value may vary among authors³. It is important that stress or clenched fist views must be performed to elicit dynamic instability which is often undiagnosed. If the diagnosis is not clear from radiographic evidence but the clinical signs suggest otherwise, a diagnostic arthroscopy is indicated³.

In acute setting i.e. less than one week, direct repair of the torn ligaments is possible¹. However, as many patient

present late, other options need to be explored. Dorsal capsulodesis is one of the options used in providing the stability required. Although tenodesis have been suggested previously but studies have showed that these techniques were inferior to the simple dorsal capsulodesis^{4,5}.

Variations to the dorsal capsulodesis have been described⁴ since it was introduced by Blatt⁵ in 1987. Our technique differs slightly from its original description. Blatt dorsal capsulodesis uses part of dorsal radiocarpal ligament (DRCL) which is lifted distally from the scaphoid and reattached to an extended scaphoid in a check rein manner via a dorsal bony trough and pulled out volarly with a button over the distal pole of scaphoid externally. Another technique popularized by Berger *et al* uses the inferior part of dorsal intercarpal ligament (DICL) which is lifted off its attachment to the triquetrum and the scaphoid held in reduced position and the capsular flap attached to distal radius with anchor sutures. Our technique makes use of the inferior part of dorsal intercarpal ligament (DICL) as in Berger's with the variation that the flap is lifted off its scaphoid attachment and inserted via a bony trough in the lunate and scaphoid and held with anchor sutures. It therefore directly stabilizes the SL interval both volarly and dorsally. In contrast to other techniques which only increase the stability of the dorsal SL component, our technique would seem

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superior. We hope that these results would enlighten us on the benefits of our modified capsulodesis.

In summary, wrist sprain should be investigated thoroughly by health care professionals as the true pathology plaguing a patient with consistent wrist pain may require specialized attention. In most instances, these conditions are often missed and over time patients

who are affected will find that their hand function gradually diminishing. We have found that our technique in performing a modified version of Blatt's original description of dorsal capsulodesis, has been proven reliable in treating scapholunate disassociation which addresses both volar and dorsal aspect of the scapholunate interval and may be more appropriate for cases where SLD are diagnosed late.

References

1. Elsaidi GA, Ruch DS, Kuzma GR, Smith BP. Dorsal Wrist Ligament Insertions Stabilize the Scapholunate Interval. *Clin Orthop Rel Res.* 2001; 425: 152-57.
2. Linscheind RL. Scapholunate ligamentous instabilities. *Ann Chir Main.* 1984; 3: 323-30
3. Adolfsson L *et al.* Arthroscopic Diagnosis of ligament lesions of the wrist. *J Hand Surgery.* 1994; 19B: 505-12.
4. Taizoon H, Baxamusa M. Capsulodesis of the Wrist for Scapholunate Disassociation. *Techniques in Hand and Upper Extremity Surgery.* 2005; 9 (1): 35-41.
5. Blatt G *et al.* Capsulodesis in Reconstructive Hand Surgery: Dorsal Capsulodesis for the unstable scaphoid and volar capsulodesis following excision of distal ulna. *Hand Clin.* 1987; 3: 81-102.