

A Rare Case of a Scapholunate Ligament Rupture in a Prepubescent Child

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1. Abstract

1.1. Background: Scapholunate Ligament (SLL) rupture remains a rare entity in the realm of paediatric injuries and can be difficult to diagnose due to the incomplete ossification of the carpal bones in young children. The treatment of such injuries can be complicated as there is the possibility of disrupting growth in the immature carpus with surgical intervention, or ongoing wrist instability with non-operative management.

1.2. Case: An 11-year-old child presented after a fall onto the wrist. She was managed as a soft tissue injury and her radiographic imaging was reported as showing no injury. Initial non-operative management was unsuccessful with persistent wrist instability. Magnetic Resonance Imaging (MRI) demonstrated a rupture of the SLL. She subsequently underwent reconstruction utilising extensor carpi radialis brevis. Her follow up demonstrated a stable wrist with good range of movement.

1.3. Discussion: This unusual injury is not considered in the young paediatric population. The youngest age for SLL rupture reported in literature is 7 years. Widening of the scapholunate interval on a posteroanterior radiograph indicates a diagnosis of scapholunate ligament dissociation in adults. In children, this interval is age dependent and normally appears widened during early life due to the cartilaginous carpal bones. Therefore, this poses diagnostic difficulty in this population.

1.4. Conclusion: Though scapholunate ruptures are rare in prepubescent children, they can still occur. We highlight this uncommon case to raise awareness of this injury and timely management to minimise long term sequelae in this young population.

They can still occur. We highlight this uncommon case to raise awareness of this injury and timely management to minimise long term sequelae in this young population.

2. Introduction

Scapholunate Interosseous Ligament (SLIL) injury is rare in the paediatric population and difficult to diagnose due to the incomplete ossification of the carpal bones [1, 2]. The treatment of such injuries is multifaceted as there is the possibility of disrupting growth in the immature carpus, with either surgical or non-operative management [3].

3. Case Report

An 11-year-old, right-hand-dominant girl was referred to the paediatric fracture clinic from the emergency department after falling onto a left hyperflexed wrist one month prior to initial presentation. A thorough history about the mechanism of injury was taken and examination performed; as well as radiographs of the hand.

There was no evidence of bony injury on these radiographs, and it was reported as having no injury. However, there appeared to be widening of the scapholunate interval seen in (Figure 1). Non-operative treatment was trialled for four months with no success. Five months post injury, the patient was still complaining of pain in her left wrist and had a positive Kirk Watson test, indicating that the scapholunate ligament was ruptured. This was confirmed with a magnetic resonance imaging (MRI) scan (Figure 2). Consequently, she was listed for reconstruction of the scapholunate ligament.



Figure 1: Pre-Operative Anteroposterior and Lateral Radiographs of the Left Wrist



Figure 2: Magnetic Resonance Scan of the Left Hand Five Months After Injury Indicating a High Probability of a Torn Scapholunate Ligament

A dorsal midline incision was made over Lister's tubercle with mobilisation of the extensor pollicis longus and retraction of common extensors to expose the underlying joint capsule. A distally based U-shaped flap was made. Exploration demonstrated a ruptured scapholunate ligament with few intact volar fibres. Kirschner (K-) wires were utilised as a joystick to reduce the scapholunate orientation. Three K-wires were inserted into the mid-point of the lunate, proximal scaphoid and distal scaphoid. A 2.5 millimetre (mm) wide, distally attached 10-centimetre-long tendon graft was harvested from extensor carpi radialis brevis (ECRB) and was loaded onto an anchor along with suture tape. This was fixed first to the proximal scaphoid, then lunate and reversed to the distal

pole of the scaphoid with 3.5 mm polyetheretherketone (PEEK) anchors. Satisfactory stability was achieved and confirmed by on table screening with image intensifier. Finally, a 1.6mm K-wire was inserted from the waist of the scaphoid to the capitate, as shown in (Figure 3). The skin was closed with a combination of sutures and Steristrips and the patient was placed in a below elbow plaster of Paris backslab.

Gentle wrist exercises were initiated 4 weeks post-surgery to regain wrist motion and the K-wires were removed 8 weeks after the initial operation. In the regular clinic follow ups, the patient demonstrated unrestricted range of movement of the wrist with minimal discomfort.

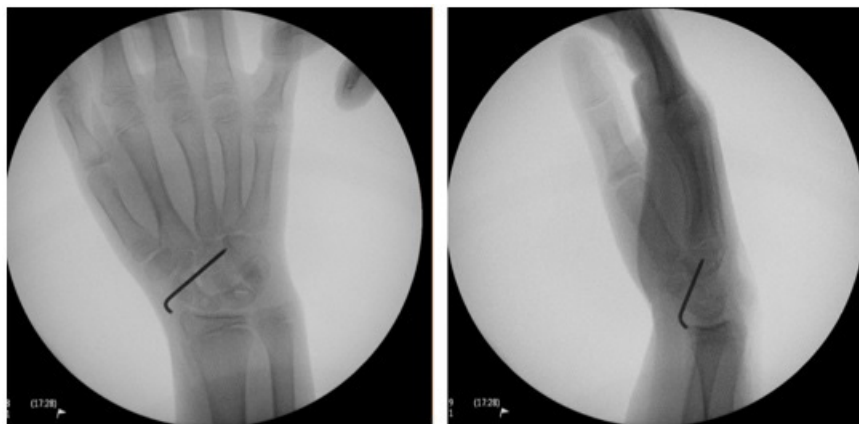


Figure 3: Intraoperative Anteroposterior and Lateral Radiographs of the Left Wrist

4. Discussion

SLIL tears are rare amongst children, although this is a relatively common diagnosis amongst the adult population.⁴ The youngest age for SLIL rupture reported in literature is 7 years.³ Widening of the scapholunate interval on a posteroanterior radiograph indicates a diagnosis of SLIL dissociation. In children, this interval is age dependent and normally appears widened during early life due to the cartilagenous carpal bones.² Therefore, this poses diagnostic difficulty in this population.

Surgical techniques are aimed at repairing the SLIL disruption. Ideally, reconstruction should take place within 3 to 4 weeks from the injury. Our patient first presented after 4 weeks post injury, hence initially opting for non-operative management. Due to the chronic nature of the injury, reconstruction with an augmented ECRB tendon graft with suture tape was preferable to primary repair. This procedure allows reconstruction of the scapholunate interval with minimal trauma and disturbance of surrounding maturing osseous structures [4].

There were few intact volar fibres with no evident volar intercalated segmental instability (VISI) deformity. This was one of the reasons for choosing a dorsal approach in this patient. The operative technique described above utilizes K-wires. Although, this will stabilize the scapholunate joint, there is a potential problem that the wires would interfere with skeletal growth if long term follow up of such patients is unavailable.³ The other concern is the risk of scaphoid fracture with this technique. This was mitigated by careful screening during drilling and by application of immobilization post-operatively. As demonstrated at the three months' post-surgical review, our patient has had a good outcome from this operative technique.

5. Conclusion

It is easy to forget that this injury can occur in children due to the appearance of ossification centres on radiographs. We highlight this case so that emergency and orthopaedic clinicians have a low threshold for considering this diagnosis in children presenting with similar complaints.

References

1. Mawdsley MJ, Jalul M, Humphreys AR. Distal scaphoid fracture and scapholunate ligament injury in a child. *J Hand Surg Eur.* 2013; 38: 574-5.
2. Kaawach W, Ecklund K, Canzio JDI. Normal Ranges of Scapholunate Distance in Children 6 to 14 Years Old. *J Pediatr Orthop.* 2001; 21: 464-7.
3. Ved A, Kowshik J, Singh R. Scapholunate dissociation in a child: A case report with modified extra-osseous reconstruction technique. *International Journal of Orthopaedics Sciences.* 2015; 1: 06-8.
4. Cook PA, Kobus RJ, Wiand W, Yu JS. Scapholunate Ligament Disruption in a Skeletally Immature Patient: A Case Report. *J Hand Surg.* 1997; 22: 83-5.