

## Sesamoid arthrodesis of the thumb interphalangeal joint to prevent hyperextension

Dear Sir,

Chronic hyperextension of the thumb most commonly occurs at the metacarpophalangeal joint (MCPJ). It is associated with degenerative, inflammatory and congenital conditions, as well as being a sequela of hyperextension injury (Tonkin et al., 1995). A number of procedures have been described to correct this with satisfactory results. Of these, sesamoid arthrodesis can be successful, durable and advantageous over MCPJ fusion, as a functional range of flexion is maintained (Tonkin et al., 1995; Gwilym et al., 2005).

Chronic hyperextension instability of the thumb interphalangeal joint (IPJ) is less frequently described but can be functionally disabling (Figure 1). There are few surgical options specifically for the thumb IPJ. Those available usually describe the repair of the volar plate in acute injuries (Engber, 2000). We performed a sesamoid arthrodesis to correct symptomatic chronic hyperextension instability of the thumb IPJ in two patients with an intact volar plate.

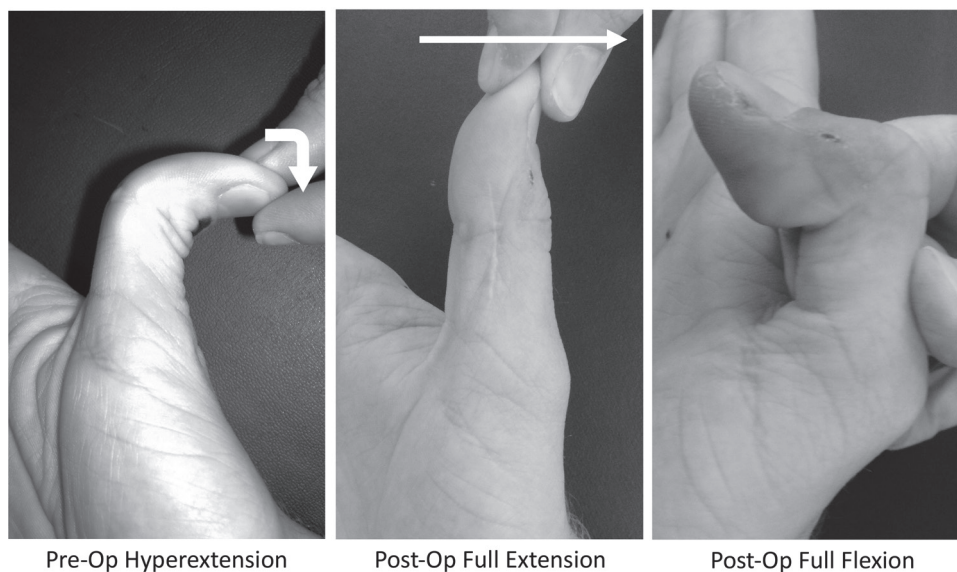
A 16-year-old male reptile handler presented with symptomatic chronic 45° hyperextension of his dominant thumb IPJ (Case 1) without a history of injury. The other patient was an 18-year-old male professional golfer (Case 2) who presented with symptomatic chronic 90° hyperextension of his dominant thumb IPJ (Figure 2). There was a history of minor trauma several months previously, but magnetic resonance imaging demonstrated no soft tissue injury

and revealed an intact volar plate. Initial treatment with extension-blocking splints failed to give lasting benefit, so we recommended surgical stabilization.

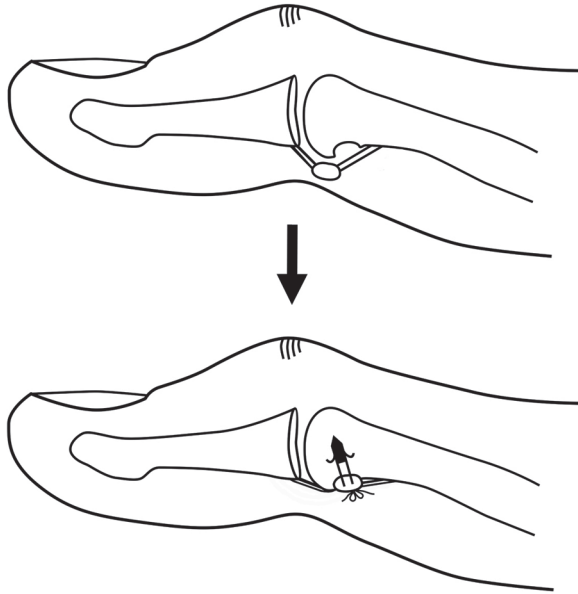
A sesamoid bone at the thumb IPJ is essential for this technique and must be seen on plain radiographs. Cadaver and radiological studies suggest a variable rate of patients having a thumb IPJ sesamoid, with most being bilateral (Joseph, 1951). The sesamoid is embedded within the middle of the joint capsule and is distinct from the tendon of flexor pollicis longus that overlies it (Engber, 2000).

The surgical technique was similar to the sesamoid arthrodesis of the thumb MCPJ (Tonkin et al, 1995). A radial mid-lateral incision was made, elevating and protecting the neurovascular bundle. The accessory collateral ligament was elevated and the IPJ capsule incised. The sesamoid was identified and its articular surface decorticated using a burr. The corresponding area of the proximal phalanx neck was similarly decorticated (Figure 2) and a mini anchor (DePuy Mitek®, MA, USA) inserted through this defect in the neck of the proximal phalanx. The sesamoid bone was then sutured, stabilizing the palmar aspect of the joint (Figure 2). Alternative methods to secure the sesamoid in place, such as screw fixation, may be considered. The joint capsule and skin were closed in layers. A bulky dressing and thumb spica forearm splint immobilized the joint for 2 weeks. A thermoplastic extension-blocking splint was applied for a further 4 weeks, after which active flexion and extension exercises were started.

No postoperative complications were encountered. At follow-up (Case 1: 41 months and Case 2: 27 months) hyperextension had been abolished (Figure 1) and a



**Figure 1.** Demonstration of preoperative hyperextension, postoperative full extension and flexion (Case 2).



**Figure 2.** Cortical area created over the neck of the proximal phalanx, sesamoid bone secured with a suture anchor.

functional range of flexion had been preserved (Case 1: 0-0-90°, Case2: 0-0-80°). Both returned to their previous level of activity. Potential sources of failure include stretching of the volar plate or pulling out of the suture anchor, though neither have occurred.

### Conflict of interests

None declared.

Patient consent obtained.

### References

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## Don't slip up! A modified technique for assessing central slip injuries

Dear Sir,

Closed rupture of the central slip of the extensor expansion of the fingers is a common injury. The mechanism is usually related to forceful flexion or anterior dislocation of the proximal interphalangeal joint (PIPJ). If the injury is missed, a boutonnière deformity develops in the majority of cases (Souter, 1967). After disruption of the central slip, the imbalance of forces around the PIPJ allows palmar migration of the lateral bands, leading to attenuation of the triangular ligament and oblique fibres of the intrinsics. This causes apparent subluxation of the lateral bands, resulting in the typical 'zig-zag collapse'. The deformity is not clinically evident at first, but with time it becomes more apparent. Initially the deformity is passively correctable, but can become fixed if left untreated.

The diagnosis of a central slip injury is made by obtaining a thorough history and carrying out a careful physical examination. An understanding of the mechanism of injury and complex extensor anatomy of the finger is of great importance. Associated swelling and pain can make the examination difficult and the use of digital nerve blocks is helpful. Several non-invasive techniques for assessing the integrity of the central slip have been described. The difficulty in diagnosing an isolated central slip injury is that both the central slip and the lateral bands are capable of extending the PIPJ. To eliminate the contribution of the lateral bands, assessment of the central slip should be done with the PIPJ in flexion.

Rubin et al. (1996) carried out a cadaveric analysis of four tests (Boyes; Carducci/Lovett and McCalla; Elson; and Smith and Ross) in order to assess their efficacy in demonstrating a central slip deficiency. The analyses assessed whether the test could detect a preboutonnière (Type A) and/or a passively correctable boutonnière (Type B) injury. A Type A injury was simulated by dividing the central slip, and a Type B injury was simulated by dividing the central slip, triangular ligament and the oblique fibres of the interosseous insertion. Elson's test (Elson, 1986) was the only one that was positive in both injury types.

In our experience, the technique described by Elson is awkward to carry out. The table edge tends to obstruct the examination and the distal phalanx is usually difficult to visualize, complicating interpretation of results. We propose a modified technique based on the principles described in the original Elson test.

The patient is seated opposite the examiner and asked to rest the flexed elbow on the table. The