

Reduction and Association of the Scaphoid and Lunate (RASL)

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In 1984, Faithfull and Timothy Herbert described the use of the Herbert screw for small joint fusion of the hand in the *Journal of Hand Surgery* [4]. It was their way to illustrate the quality of a wonderful headless compression screw, which would mark the end of the century in interfragmentary screwing of small bones. It was the first time that internal splinting of the small bones was described and more specifically scapholunate synostosis – syndesmosis – with a headless compression screw.

In 1991, Timothy Herbert described in the *World Journal of Surgery* his new technique of scapho-lunate repair using a Herbert screw (Fig. 1) [6].

RASL stands for reduction and association of the scaphoid and lunate, and the goal is to recreate an association between the two bones (scaphoid and lunate) with a bony or fibrous link. Biomechanics are not restored but are more physiological than the alternative procedures (Blatt dorsal capsulodesis, scapho-trapezoido-trapezium arthrodesis, Brunelli standard or modified).

The indications are subacute ligamentary repair (stage III and IV as described by Garcia-Elias et al. [5]). This means reducible, dissociative instability with good cartilage quality. Contraindications for this operation are pre-existing arthrosis whether radio-carpal or between scaphoid, trapezoid and trapezium. Radio-styloid arthritis is not a contraindication.

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Fig. 1 Immediate Postop view showing the Herbertscrew in place (X-Ray Courtesy of Dr Jean Michel Cognet, Reims, France); note the styloidectomy of the Radius



The technique described by Faithfull et al. is based on a dual incision dorsal and radial in a longitudinal way. The dorsal incision is for the actual surgical procedure; the radial approach is used to perform the styloidectomy and insert the headless compression screw (Herbert, HCS, etc.).

The dorsal approach is a 3–4 extensor compartment incision with a U-shaped distally based flap of the capsule. Other approaches described by Berger and Bishop are also possible [2]. Inspection of the scapholunate gap and quality of the cartilage is performed, and placement of two 1.5-mm K-wires in the distal radial portion of the lunate and the distal ulnar portion of the scaphoid is performed to act as joysticks. Care is taken to place the K-wire in a maximal divergent angle in order to correct the instability by clamping both K-wires together with a Kocher [7]. With a knife, we perform the sharp removal of the ligament remnants, and we remove with a bur and rongeur the cartilage until cancellous bone is exposed.

With the radial approach, the styloid is removed through the first extensor compartment, which is reclined in a volar way. After resection of the styloid, exposure of the scaphoid is realised. The removal of the styloid diminishes the impingement of the scaphoid, eases the insertion of the bone screw and can also enhance the results by removal of degenerated articular surface of the styloid of the radius.

Afterwards, a reduction of the scaphoid and lunate is performed with the joysticks by clamping them with a Kocher; a K-wire is placed between scaphoid and lunate from radial to ulnar, slightly distal to the mid-waste of the scaphoid taking care not to penetrate the midcarpal joint space. The cannulated bone screw (Herbert) is inserted from radial to ulnar under image intensifier.

After placing the screw, joysticks are removed and the mobility is tested in flexion and extension. Next, closure of the capsular is performed to avoid capsulodesis.



Fig. 2 Same patient as in figure 1, 3 months after the RASL procedure: note the lysis around the screw (*left*) and perforation of the screw in the radiocarpal joint (*right*) (Courtesy of Dr Jean Michel Cognet, Reims, France)

Postoperatively, a short arm spica cast is applied for 4–6 weeks and rehabilitation is started.

The long-term results of this procedure are not well documented in the literature. Two articles report good results: Zubairy et al. [8] report in 2003 a 70 % overall satisfactory result; Alnot, with a slightly different procedure, reports a 90 % satisfactory [1].

Overall, the RASL procedure is not very popular; publications are rare but the early reported results were satisfactory. The aim is not a consolidation but a tight fibrous fusion, as you would expect in a hypertrophic pseudarthrosis. Recent publications by Cognet et al. report an overall bad result (Fig. 2) and recommend abandoning this technique [3]. It should be reminded as a historic option for treatment of a chronic non-arthritic radio-scapho-lunate dissociation.

References

1. Alnot JY, De Cheveigne C, Bleton R (1992) Instabilité scapho-lunaire chronique post-traumatique traitée par arthrodèse scapho-lunaire. *Chir Main* 11(2):107–118
2. Berger RA, Bishop AT (1997) A fiber-splitting capsulotomy technique for dorsal exposure of the wrist. *Tech Hand Up Extrem Surg* 1(1):2–10
3. Cognet JM, Levadoux M, Martinache X (2011) The use of screws in the treatment of scapholunate instability. *J Hand Surg Eur Vol* 31(8):690–693
4. Faithfull DK, Herbert TJ (1984) Small joint fusions of the hand using the Herbert screw. *J Hand Surg Br* 9B:167–168

5. Garcia-Elias M, Lluch AL, Stanley JK (2006) Three ligament tenodesis for the treatment of scapholunate dissociation. *J Hand Surg Am* 31A:125–134
6. Herbert TJ (1991) Acute rotatory dislocation of the scaphoid: a new repair using Herbert screw fixation across the sapho-lunate joint. *World J Surg* 15:463–469
7. Rosenwasser MP et al (1997) The RASL procedure: reduction and association of the scaphoid and lunate using the Herbert screw. *Tech Hand Up Extrem Surg* 1(4):263–272
8. Zubairy A, Jones WA (2003) Scapholunate fusion in chronic symptomatic scapholunate instability. *J Hand Surg* 28(4):311–314