

Outcomes of Scapholunate Ligament Repair or Reconstruction with and without Internal Bracing: A Retrospective Cohort Study with a Mean Follow-up of 3 years

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INTRODUCTION:

Internal bracing (IB) employs ultra-high molecular weight polyethylene tape to reinforce ligament and tendon repairs, enhancing mechanical strength and healing. This study aims to compare the radiographic and clinical outcomes of primary scapholunate ligament repair or reconstruction (SLR) with and without the use of IB. The null hypothesis is that no differences in radiographic and clinical outcomes will be exhibited after SLR with and without IB.

METHODS:

This single institution retrospective cohort study evaluated patients who underwent SLR with and without IB between January 2016 and November 2024. Patients ≤ 18 years old, those with missing data, and revision cases were excluded. Data collected encompassed patient demographics, operative details, and radiographic assessments at the final follow-up visit. Osteolysis around the anchoring sites was assessed by comparing immediate postoperative radiographs to those taken at final follow-up. The primary outcome was radiographic evidence of osteolysis. Secondary outcomes were reoperations, complications, and Visual Analog Scale (VAS) pain scores. A total of 59 patients (49 males, 10 females) with a mean age of 45 ± 14 years were included in the study. IB was used in 63% of patients undergoing SLR. The mean follow-up duration was 38 ± 25 months. P values less than or equal to 0.05 were considered significant.

RESULTS:

Osteolysis was observed in 18 cases; 17 in the IB group and 1 without IB ($p=0.002$). There were two reoperations, both occurring in patients without IB: one due to hardware failure in a diabetic patient, and the other due to collapse of an SLR following metallic anchor fixation, which was subsequently revised with a dorsal fusion plate. Despite a higher reoperation rate in patients without IB, Fisher's exact test revealed no statistically significant difference in reoperation risk between the groups ($p=0.3$). In total, 8 complications were reported, 6 in the IB group and 2 in the group without IB ($p=0.7$). There were statistically significant reductions in VAS pain scores at final follow-up ($p<0.001$). A significant difference in postoperative VAS pain scores was observed between the group with IB and without IB (1.2 vs. 0.1, respectively; $p=0.003$).

DISCUSSION AND CONCLUSION:

Patients undergoing repair or reconstruction of the scapholunate ligament with IB demonstrated a significantly higher likelihood of developing osteolysis compared to those without IB which may be due to using the swivelock; however, this did not lead to reoperations or clinically adverse outcomes. Therefore, the significance of the osteolysis in short term is not evident. Importantly, all complications in the IB group were managed nonoperatively, and low postoperative pain scores were observed regardless of IB use. These findings suggest that SLR with IB remains safe, characterized by minimal postoperative pain and radiographic osteolysis that appears to be clinically insignificant. Of note, long-term, prospective studies are warranted to assess the significance of osteolysis and to better characterize outcomes in patients with IB who develop complications.



Figure 1. Series of the left hand demonstrating table latency at the lunate anchoring site



Figure 2. Example of progressive osteolysis of the lunate (A,B). Example of progressive widening of the scapholunate interval (C,D).

Table 1: Demographic Data (n=59)

Characteristic	Value
Age (years)	44.5 ± 14.0
Sex (F/M) (n, %)	10 (16.9%) / 49 (83.1%)
Follow-up (months)	37.8 ± 24.7
Internal Bracing (Y/N) (n, %)	37 (62.3%) / 22 (37.7%)
BMI (kg/m ²)	28.5 ± 5.8
Dominant arm (n, %)	30 (51%)
RA (n, %)	0 (0%)
OA (n, %)	4 (7%)
DM (n, %)	3 (5%)
Smoker (n, %)	6 (10%)
Prior SLR (n, %)	0 (0%)

Table 2: Postoperative Data

Characteristic	Internal Bracing (n=37)	Without Internal Bracing (n=22)	Overall (n=59)	p-value
Osteolysis (n, %)	17 (46%)	1 (5%)	18 (31%)	0.002
Reoperation (n, %)	0 (0%)	2 (9%)	2 (3%)	0.3
Complications (n, %)	6 (16%)	2 (9%)	8 (14%)	0.7
Final Post-Op Distances				
>2mm	23 (62%)	9 (41%)	32 (54%)	0.10
Average Change in Scapholunate Interval (Distance mm)	0.4 ± 2.0	1.2 ± 2.0	0.7 ± 2.0	0.14
Average Final Scapholunate Interval (Distance mm)	5.3 ± 1.4	4.3 ± 1.4	5.0 ± 1.4	0.06