Posterior Radioscaphoid Angle as a Predictor of Wrist Degenerative Joint Disease in Patients With Scapholunate Ligament Tears

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• Sapholunate ligament tears: most common and the most serious type of wrist ligament injury

• SLAC: palliative treatment

• Dorsal scaphoid displacement associated with the development of SLAC wrist

SLAC : Scapho Lunate Acute Collapse

2- Pappou IP, Basel J, Deal DN. Scapholunate ligament injuries: a review of current concepts. HAND. 2013
Scapholunate dissociation

4- Watson HK, Brenner LH Degenerative disorders of the wrist. J Hand Surg 1985
• Difficulties to evaluate the dorsal displacement of scaphoid on conventional radiographs: Bone superimposition\(^5\)

• Objective diagnostic criteria on CT\(^6\) ?

• Posterior radioscorpoid angle (PRSA):
  – Angle formed between the radial articular surface plan and the posterior-most point of the scaphoid

•Objective: determine whether the PRSA is associated with degenerative joint disease in patients with scapholunate ligament tears

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6- Strauch RJ. SLAC and SNAC arthritis--update on evaluation and treatment. J Hand Surg Am. 2012
• Retrospective study between 2009 and 2013
• 600 patients underwent conventional radiographs and CT arthrographies

150 patients randomised

38 exclusions:
- previous wrist surgery
- known inflammatory joint disease of the wrist
- other types of carpal instability

112 patients

Control Group:
- normal SLL or isolated tear of the membranous component

Study Group:
- Tears of the dorsal or volar components of the SLL
## Imaging Protocol

- **Radiographs:**
  - at least three views
  - PA, lateral, and posteroanterior with a clenched fist

- **CT arthrography:**
  - Neutral position
  - Reconstructed in all orthogonal planes
  - Bone and soft-tissue kernels

## Readers

- Two radiologists with 2 and 6 years of clinical experience
- Independent analysis
CT arthrography

- Posterior most point of the scaphoid
- Posterior and anterior rims of radius
### Conventional radiographs

- **Scapholunate angle**
- **Radiolunate angle**
- **Severity of SLAC**

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8- Gilula LA, et al ; IWI Terminology Committee. Wrist terminology as defined by the IWIW. J Bone Joint Surg Am 2002
• 68 male et 44 female
• Mean age : 41.3 (15 à 68 years old)
• Intraobserver agreement was almost perfect (ICC 0,82 et 0,92)
• PRSA larger in patients with SLL rupture ($p < 0.0001$)
• No correlation between PRSA and SLAC wrist severity
• 114° was selected as the cutoff for optimal performance for the differentiation of patients with and without SLAC wrist

<table>
<thead>
<tr>
<th>Angle</th>
<th>Control group</th>
<th>SLL tears without SLAC</th>
<th>SLL tears with SLAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scapholunate angle</td>
<td>53 ±11°</td>
<td>59 ±15°</td>
<td>76 ±15°</td>
</tr>
<tr>
<td>Radiolunate angle</td>
<td>10 ±7°</td>
<td>15 ± 10°</td>
<td>19 ± 10°</td>
</tr>
<tr>
<td>PRSA</td>
<td>98 ± 8°</td>
<td>105 ± 8°</td>
<td>122 ± 9°</td>
</tr>
</tbody>
</table>
F 22 years old
SLL tears
Without SLAC
PRSA = 97°
F 22 years old
SLL tears
Without SLAC
PRSA = 97°

M 40 years old
LSL years
SLAC 1
PRSA = 127°
M 45 years old
Chronic wrist pain

Radiographs: no SLAC

Arthro scanner: SLL tears

1: PRSA: 126°
2: Early degenerative changes at radial articular surface (arrow) and at lunocapitate joint line, characterized by chondral wearing and subchondral bone irregularity (arrowheads).
• Four PRSA $> 114^\circ$ without SLAC on radiograph:
  – Two of these patients: equivocal chondral damage visible on CT arthrography
  – Two other patients: young patients (18 and 22 years old):
    • Significant anomalies of carpal function
• Early surgical treatment
Study of the posterior displacement of the scaphoid is important because it is a **prognostic factor in the development of SLAC**

**PRSA:**

- Quantitative tool for the evaluation of posterior displacement of the scaphoid in cases of SLL tear
- Abnormal PRSA values: biomechanical changes with potential implications for patient management

*Analysis of Posterior Scaphoid Displacement on CT in Patients with Scapholunate Ligament Tears*