Radiological evaluation of the ScaphoLunate InterCarpal Ligamentoplasty for chronic scapholunate dissociation in cadavers

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Gilles Dautel and Nicolas Pauchard declare a conflict of interest with Arthrex®. The other authors declared no potential conflicts of interest.

INTRODUCTION

- SUC procedure: ScaphoLunate & InterCarpal Ligamentoplasty
- Indication: Chronic Reducible ScaphoLunate Dislocation without arthritis (Garcia Else Stages 3 and 4).
- Palmar Longus Tendon Interposition Graft and Dorsal Inter-Carpal Ligament.
- Rotatory Subluxation of Scaphoid and DSI Deformity.
- Aim of the study: Evaluate radiological performances in a cadaveric study.

METHODS

- Cadaveric Study.
- Anatomy Lab (Nancy Medical School – Lorraine).
- 12 upper extremities: forearm to fingers.
- Fresh adult cadavers.
- Any pre-existing abnormality of the scapholunate joint.

PROTOCOL: 1st TIME

- 3 Palmar Tendon Units:
  - FCU
  - Flexor Digitorum
  - ECRL
- 3 Dorsal Tendon Units:
  - ECRL
  - Extensor Digitorum
  - ECU
- FiberTape® 2.0 (Arthrex®)
- Weight (5 to 10 kg) to simulate different positions of the wrist.

PROTOCOL: 2nd TIME

- STATIC SCAPHO LUNATE DISOCIATION
  - Dorsal Capsulotomy (i.e. Berger). Section of the SUL and DIC ligaments.

PROTOCOL: 3rd TIME

- 3 LT + SUC Ligamentoplasty
  - 6 SUL + 6 LT
  - All wrists with PL
  - 100 cycles of simulated Flexion-Extension ligament loosening.

RESULTS

- Before sectioning the SUL and DIC ligaments - No dissociation
  - Static ScaphoLunate Gap: 2.0 mm
  - Dynamic ScaphoLunate Gap: 2.5 mm
  - Scapholunate Angle: 58°
  - Capitohamate Angle: 4°

- Pathological values: SUL greater than 3 mm, SLA greater than 90° and CLA more than 15°.

CASE 1: After using ligaments

- Static Scapholunate Gap: 3.3 mm
- Dynamic Scapholunate Gap: 5.1 mm
- Scapholunate Angle: 78°

CASE 1: Post SUC ligamentoplasty

- Static Scapholunate Gap: 2.1 mm
- Dynamic Scapholunate Gap: 2.6 mm

CONCLUSION

- Significant improvement: ScaphoLunate Gaps and Angles.
- Reduced scapholunate dissociation (Posterior Scaphoid Subluxation).
- Restore scapholunate joint stability and normal carpal anatomy.
- Similar to 3LT in terms of restoration of carpal aligment.
- Role of DIC Ligament.
- Wrist movements during activities of daily living (Ligament loosening).
- Prospective Clinical Study.