Arthroscopic Deltoid Ligament Repair: Technique and Anatomic Study

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DISCLOSURE

• JIA - Arthrex consultant, speaker, royalties

• PGM - Arthrex consultant, speaker, royalties
ARTHROSCOPIC DELTOID LIGAMENT REPAIR

PURPOSE

• Evaluate the proximity of anatomic structures for a novel arthroscopic deltoid ligament stabilization technique

• Define ideal landmarks and “safe zones” for this repair.
BACKGROUND: ACUTE DELTOID INJURY WITH ANKLE FRACTURE – HISTORICAL TREATMENT PARADIGM

- Lateral malleolus fracture with increased medial clear space does not need repair of the deltoid ligament if stable lateral construct obtained
  - Shown in several older studies
  - Most shorter followup (though some as long as >10 years)
- However, this paradigm was tested in an era of cast immobilization for 6-8 weeks time frame.
  - Current treatment protocols now emphasize:
    - Early motion
    - Early weightbearing
ARTHRORSCOPIC DELTOID LIGAMENT REPAIR

METHODS

• 5 human cadaveric ankle specimens

• All specimens underwent arthroscopic deltoid ligament repair with a suture passer and suture anchor technique

• Cadaveric specimens were dissected to determine the proximity of anatomic structures after repair.

• Measurements of anatomic safe zone:
  • PTT to Saphenous nerve/vein
  • PTT to suture knot
  • Saphenous nerve/vein to suture knot
ARTHROSCOPIC TECHNIQUE

Anchor placement views
ARTHROSCOPIC DELTOID LIGAMENT REPAIR

TECHNIQUE: SUTURE RETRIEVAL & PASSAGE

Retrieve suture through anteromedial portal

Suture retrieved via accessory incision

Sutures tied

Postoperative Incisions
# ARTHROSCOPIC DELTOID LIGAMENT REPAIR

## RESULTS

<table>
<thead>
<tr>
<th></th>
<th>PTT to Saphenous v.</th>
<th>PTT to knot</th>
<th>Saphenous v. to knot</th>
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</thead>
<tbody>
<tr>
<td><strong>Mean Distance (mm) ± Standard Deviation</strong></td>
<td>20.5 ± 3.4</td>
<td>15.5 ± 2.9</td>
<td>3.2 ± 3.7</td>
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<tr>
<td><strong>Range (mm)</strong></td>
<td>16-25</td>
<td>12-20</td>
<td>0-9</td>
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*Table I. Mean distances, standard deviation, and range for anatomic structures measured.*
ARTHROSCOPIC DELTOID LIGAMENT REPAIR
SAFE ZONE RESULTS

Saphenous vein

Posterior tibial tendon
There is a relatively wide safe zone between the PTT and the saphenous vein when performing the arthroscopic deltoid ligament stabilization technique.

None of the critical anatomic structures (except for saphenous vein) were entrapped by the suture knot.

Study defines proximity of adjacent anatomic structures and establishes anatomic safe zones for the arthroscopic deltoid ankle stabilization procedure.
TECHNIQUE
REFERENCES