Surgical Treatment of Chronic Lateral Ankle Instability

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Pathoanatomy

- Brostrom (1966)
  - 60 patients
    - 60 ATFL alone
    - 16 ATFL+CFL
    - 0 CFL alone
- Brunner (1991)
  - 180 injuries
    - 56% ATF/CF
    - 15% just CF
Radiologic Evaluation

- Radiographs
  - AP, mortise, & lateral views
- Stress views
- CT
- MRI

Associated pathology
Associated Pathology

- Peroneal tenosynovitis - 77%
- Peroneus brevis tear - 25%
- Attenuated peroneal retinaculum - 54%

• DiGiovanni et al. (2000)
Surgical Indications

• Failed conservative treatment
• Pain
• Recurrent “giving way” episodes
• Clinical/radiographic evidence of instability
Surgical Techniques

• Tenodesis (Check-rein) Procedures
  – Watson-Jones
  – Evans
  – Chrisman-Snook (modified Elms lie)

• Anatomic Procedures
  – Brostrom
  – Modified Brostrom (Gould et al.)
  – Elmslie
Tenodesis Procedures

Elmslie Procedure

- Elmslie (1934)
- ATFL & CFL reconstructed using a ½ inch fascia lata strip
- 4 patients
- 4/4 successful
Tenodesis Procedures

Watson-Jones Procedure

- R. Watson-Jones (1943)
- Combined tenodesis/ligament reconstruction using peroneus brevis tendon
- “It has proved uniformly successful in a large series of cases.”
- Only repairs ATF
Tenodesis Procedures

Watson-Jones Technique

- Barbani et al. (1987)
- 43 Ankles (41 patients)
- Split peroneus brevis tendon
- Avg. follow-up = 56 months
  - Excellent = 25
  - Good = 9
  - Fair = 7
  - Poor = 1
- subtalar motion - 50%

- Van der Rijt & Evans (1984)
- 9 patients
- Avg. follow-up = 22 years (range 12-27)
  - 3/9 pain free
  - 6/9 persistent functional instability
- Marginal exostoses present in all ankles
- “…early success is not a guarantee of continuing ankle stability”
Tenodesis Procedures

Evans Procedure

- Evans (1953)
- Technically easier than Watson-Jones procedure
- Silver & Deutsch (1982)
  - 10-30° loss of inversion

Peroneus brevis
Tenodesis Procedures

Evans Procedure

• Karlsson et al. (1988)
• 42 patients
• Avg. follow-up = 14 years (range 10-17)
  – Excellent = 11 (26%)
  – Good = 10 (24%)
  – Fair = 6 (14%)
  – Poor = 15 (36%)
• Marginal osteophytes 32/42
• 13 required second operation

“…results of the Evans operation for chronic lateral instability tend to deteriorate in the long-term and that consideration should be given to the use of more complex types of reconstruction.”
Tenodesis Procedures

Chrisman-Snook Technique

- Chrisman & Snook (1969)
- Modified Elmslie – split peroneus brevis tendon
  - Technically easier than Elmslie procedure
  - Entire peroneus brevis tendon is not sacrificed
- 7 patients; 2 year follow-up
- All successful

PROBLEM—DISTAL INSERTION!!!
Tenodesis Procedures

Chrisman-Snook Technique

• Snook et al. (1985)
  • 48 patients, 10 yr follow-up
    – Excellent 38
    – Good 7
    – Fair 2
    – Poor 1
  • 16/30 ↓ inversion (5-20%)
  • Complications
    – Recurrent instability 3
    – Sural nerve injury 14

“...this procedure will restore good long-term function in a high percentage of patients who are disabled by ankle instability ...”
Tenodesis Procedures

“Unfortunately, the anatomic arrangements that resulted from these procedures (peroneus brevis tenodeses) placed the newly formed collateral ligaments in such a position that subtalar motion was always compromised.”

“(Elmslie’s) procedure demonstrated an appreciation of the mechanical relationships between the arrangement of the ligaments and the axes of motion of the ankle and subtalar joints.”

Inman, 1973
Why did they all “steal the peroneus brevis”??

- Why do they climb MT. Borah?
Disadvantages of Tenodesis Procedures

- Technically complicated
- Longer healing time
- Normal anatomy not fully restored
- Loss of subtalar motion
- Peroneal muscle weakness
- Not suitable for skeletally immature patients

Brostrom, 1966
Problems with Brostrom

- Generalized ligamentous laxity
- Long standing instability
  - Inadequate tissue present
- Heavy patients (>225 lbs)
- Heavy laborer
- Failed previous surgery
- Excessive demands through work or sports
- Athletic activity (i.e. lineman)  
  Karlsson et al., 1988
  Girardi et al., 1999
  Hamilton, 2000
  Messer et al., 2000
Medial Hamstring-Elmslie Reconstruction
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- 25 patients
- Avg. age = 33 (16-59)
- Preop AOFAS score = 57 (41-69)
  - Dorsiflexion = 14°
  - Plantar flexion = 36°
  - Inversion = 20°
  - Eversion = 10°  Isometric!
- Post-op AOFAS (95)

Coughlin and Schenck-Foot and Ankle 2003
## Results

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<tr>
<th></th>
<th>Pre-op</th>
<th>Post-op</th>
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<tbody>
<tr>
<td><strong>AOFAS</strong></td>
<td>57 pts</td>
<td>95 pts</td>
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<tr>
<td><strong>VAS</strong></td>
<td>7 pts</td>
<td>0.4 pts</td>
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<tr>
<td><strong>DF ROM</strong></td>
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<td>12°</td>
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<tr>
<td><strong>PF ROM</strong></td>
<td>38°</td>
<td>38°</td>
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<tr>
<td><strong>Subtalar ROM</strong></td>
<td>30°</td>
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Conclusions

- Operative treatment of chronic lateral ankle instability typically (85%) yields excellent or good results.
- The medial hamstring-Elmsile technique offers advantages over other tenodesis procedures.
  - More anatomic reconstruction of both ATFL & CFL
  - Preservation of subtalar motion
  - Spares peroneal tendons
  - Minimal donor site morbidity
