Modified Broström Procedure for Chronic Ankle Instability with Generalized Joint Hypermobility

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DISCLOSURE

NO CONFLICT TO DISCLOSE

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Our disclosure are in the Final AOFAS Mobile App.
We have no potential conflicts with this presentation.
Introduction

• **Modified Broström procedure**
  
  Most popular surgical treatment for chronic ankle instability


• **Not recommended for**
  
  • severely attenuated or deficient ligaments
  • failed previous repair surgery
  • increased size or weight
  • generalized joint hypermobility (GJH)

  Coughlin MJ et al. Foot Ankle Int 2004
Introduction

- **Generalized joint hypermobility (GJH)**
  - Generalized ligamentous laxity, benign joint hypermobility..
  - Joint movement that deviates ± 2 SD
  - Internationally there is no agreement
  - Most commonly defined as a Beighton-Horan score of ≥4 out of 9


- Can this tests confirm connective tissue abnormality?
- Will repaired ligaments really stretch out for patients with GJH?
Hypothesis

- There may be patients with chronic ankle instability with GJH where modified Brostrom procedure can be successful.

- When the contralateral normal ankle shows a normal varus talar tilt and anterior talar translation, GJH may have a smaller effect on ankle ligaments.
Materials

- 2010 ~ 2013
- 32 pts. (32 ankles) operated
- 26 pts. (26 ankles) could be followed-up
  - mean age at surgery: 21.7 (range, 20-37) years
  - mean follow-up: 27 (range, 17-51) months

Indications
- > 6 months of unrelieved instability, 3 months of failed rehabilitation
  - Normal contralateral ankle with physical examination and on stress tests

Contra-Indications
- insufficient ligamentous tissue for repair
- Heavy weight > 100kg
- large ossicle that created large defect after its removal
- failed previous Broström operation
Methods

- Modified Broström procedure
  
  Repair of ATFL, CFL using 2 suture anchors
  Augmentation of extensor retinaculum

- Postoperative rehabilitation
  
  2 weeks immobilization in posterior splint
  2 weeks in short leg cast
  4 weeks soft ankle orthoses

- Clinical assessment
  
  Karlsson-Peterson ankle score assessed 6 months, 12 months follow up and at final office visit
  Stress radiography at final followup, Patients’ subjective satisfaction
## Results

<table>
<thead>
<tr>
<th></th>
<th>Preop. value</th>
<th>Postop. value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karlsson-Peterson Score</td>
<td>63.6 ± 7.1</td>
<td>90.4 ± 6.7</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Talar tilt angle</td>
<td>12.2 ± 3.5°</td>
<td>6.1±2.2°</td>
<td>p&lt;0.05</td>
</tr>
<tr>
<td>Ant talar translation</td>
<td>8.1 ± 1.5 mm</td>
<td>5.3 ± 0.8 mm</td>
<td>p&lt;0.05</td>
</tr>
</tbody>
</table>

- **Complications**
  - 1 dissatisfied
    - Mechanically stable but pain
  - 9 pts. sustained ankle sprain
  - 3 mechanically unstable
  - none required reoperation

**Subjective satisfaction**

- 10 satisfied
- 16 very satisfied
- 3 fair
- 1 very dissatisfied
### Results

Clinical outcomes stratified according to Beighton Score

<table>
<thead>
<tr>
<th>Beighton scores</th>
<th>Number of patients</th>
<th>Karlsson-Peterson ankle scores</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Preoperative</td>
<td>Last follow-up</td>
</tr>
<tr>
<td>4 points</td>
<td>15</td>
<td>64.9±7.8</td>
<td>91.0±6.5</td>
</tr>
<tr>
<td>5 points</td>
<td>6</td>
<td>65.2±5.2</td>
<td>91.3±5.1</td>
</tr>
<tr>
<td>6 points</td>
<td>4</td>
<td>57.0±5.7</td>
<td>90.7±12.1</td>
</tr>
<tr>
<td>7 points</td>
<td>5</td>
<td>63.8±8.1</td>
<td>91.5±6.1</td>
</tr>
<tr>
<td>8 points</td>
<td>1</td>
<td>62</td>
<td>82</td>
</tr>
<tr>
<td>9 points</td>
<td>1</td>
<td>62</td>
<td>85</td>
</tr>
</tbody>
</table>

(Spearman's correlation coefficient, -0.11; p= 0.591, between Beighton scores and Karlsson-Peterson ankle scores at last follow-up)
Limitation

- **Short follow-up period**
  - Studies reporting poor results have encountered poor results in a short- to medium-term follow-up
  - When repaired ligaments are stretched out, it may occur early in a short- to medium-term follow-up

  - **Long term follow-up needed**

- **Positive stress tests on the contralateral normal ankle are not proven to be diagnostic for inherent ligamentous hyperextensibility**

  - **Further studies needed to better define GJH that can influence on the ankle joint (biomarkers)**
  - More cases with higher Beighton score needed
Conclusion

GJH may not be contra-indicated for modified Brostrom procedure when contra-lateral ankle has normal stress tests
References