Anatomical reconstruction of lateral ankle ligaments using free tendon allografts and biotenodesis screws:

72 consecutive cases

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Introduction

- 20%-40% of severe ankle sprain will experience *instability of recurrent inversion sprains, pain and walking difficulty on uneven ground.*
  
  – Sarmmarco VJ. Clin Orthop. 2001-

- Many surgical procedures for the unstable ankle have been described.
  

- Modified Brostrom Procedure, Despite impressive outcomes, there have been subsets of patients with increased rates of OP failure in both early and later studies.
  
  - Paul T.F et al, Foot Ankle Int. 2002 -
Anatomic Reconstruction for LAI

- Recently many reconstructive procedures using allograft/autograft tendon as the ligament substitute have been introduced.
  - Maffulli N et al, Foot Ankle Clin N Am, 2006 – 

- However few procedures satisfy 3 factors
  1. Anatomic repositioning of the ATFL & CFL
  2. Firm tendon fixation
  3. Technically reproducible

- Purpose of this study
- To evaluate the clinical and radiographic outcome of anatomical reconstruction of lateral ankle ligament using a semitendinosus allograft tendon and bio-tenodesis screws
- To compare pretensioning and Non-pretensioning of STA
Material and Method

- Duration: 2007.2 – 2013.1
- Follow up > 1 year, F/U period: 22.1 mo (12 - 68)
- 72 ankles (70 patients) of CAI
- (M / F = 51 : 19, R : L = 50 : 22)
- Age 30.3 yo (16-59): 21- 40 yo: 73%
- Duration of conservative Tx: 8.2 mo (6-24)
- BMI Mean: 26.1 (17.2 – 39.9)
- -> Obesity + overweight: 44 cases (63%)
- By single surgeon (HGJ)
Op Indications & OP technique

1. Sx. of recurrent ankle sprain
2. Physically confirmed lateral ankle instability (moderate to severe degree)
3. Varus stress view: Talar tilt angle (TTA) >10°
4. (MRI) marked attenuation/deficient ATFL
5. Physically demanding patients: more favored
6. Failed previous Brostrum OP
Clinical Evaluation

1. VAS (Visual analog scale) Pain Score
2. AOFAS Ankle-Hindfoot Scale
3. Karlsson-Peterson Ankle Instability Scale
4. Subjective satisfaction criteria (4 groups)
   - Very satisfied / Satisfied / Fair / Dissatisfied
5. Range of Motion (ROM)

Radiographic Evaluations

- TTA (talar tilt) angle (Telos, 150N)
- ATD (ant talar translation) distance (Telos, 150N)
Clinical Results

VAS

P<0.05

AOFAS

P<0.05

KALSSON

PRE

POST
Radiographic Results

- TTA (talar tilt angle) : $14.7^\circ \rightarrow 3.8^\circ$ $(p<0.05)$

- ATT (anterior talar translation) : $31.5$ mm $\rightarrow 29.5$ mm $(p>0.05)$

- Patients Satisfaction: 90% pts satisfied
  Very satisfied: 25 (38%), Satisfied: 34 (52%), Fair: 6 (9%), Poor: 1 (1%)
Graft Tensioning

Radiographic Results (Talar Tilt)

Preoperative: 15, Non-tensioning: 14.5
Postoperative: 3.9, Tension: 3.6

Radiographic Results (Ant. Draw)

Preoperative: 32.4, Non-tension: 30.5
Postoperative: 29.4, Tension: 29.7

**Pre-tensioning** and **Non-tensioning** groups were **not** statistical significance in Radiographic Results
## Complications

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<tbody>
<tr>
<td>1.</td>
<td>Sural nerve neuralgia</td>
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<td>2.</td>
<td>SPN neuralgia</td>
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<td>3.</td>
<td>Subtalar joint stiffness</td>
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<td>4.</td>
<td>Subtalar OA</td>
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<td>5.</td>
<td>Wound infection</td>
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<td>6.</td>
<td>Marginal skin necrosis</td>
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- *No revisional surgery for the Cx*
Conclusion

- **Anatomic reconstruction** of the ATFL and CFL using a *semitendinosus allograft* tendon and *bio-tenodesis screws* showed...
  1. Favorable kalsson score
  2. Minimal complication
  3. anatomic, technically reproducible with good fixability.
  4. a recommendable surgical option for deficient/poor quality ATFL/CFL with favorable clinical outcome.

- Although pre-tensioning and non-tensioning groups did not show statistical difference, the lesser probability of late ligament laxity was expected in the pre-tensioning group.