Radiological & Clinical Outcome of Lateral Ankle Instability with Medial Compartment Ankle Osteoarthritis

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No Conflict to disclose

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We have no potential conflicts with this presentation.
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- 10% to 30% of patients with ankle sprain experience chronic ankle instability
  - Karlsson J et al, Sports Med., 1993; Chronic lateral instability of the ankle in athletes

- Prolonged lateral instability of the ankle was a cause of osteoarthritis of the Medial ankle
  - Harrington, JBJS, 1979; Degenerative arthritis of the ankle secondary to longstanding lateral ligament instability

- Osteochondral defects (OCD) and Degenerative chondral defects (DCD)
  - OCD: Detachment of articular cartilage without signs of joint degeneration
  - DCD: Post-traumatic loss of joint cartilage thickness with existing degenerative joint disease (e.g. spur formation, joint space narrowing).
    - Becher, Thermann et al, KSSTA, 2010; Microfracture for chondral defects of the talus: maintenance of early results at midterm follow-up
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• Methods
  – 27 feet had LAI with medial ankle OA
  – 45 months Mean f/u & Mean 45 y/o
  – Diagnosis of LAI
    • Repeated episodes of recurrent inversion sprain
    • Evidence of lateral ankle instability by clinical and radiographic examinations (talar tilt > 10°)
      – HG Jung et al, KSSTA, 2012
  – Diagnosis of medial ankle OA
    • Pain with X-ray or MRI or Arthroscopic findings
    • Complaints: Deep, dull pain of ankle
    • X-ray: Weight-bearing radiograph
    • MRI: Signs implying OA
    • Arthroscopy: Degenerative changes of articular cartilage
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- Operative Technique of Lateral ankle reconstruction
  - Recently published our technique in Lateral Ankle Reconstruction using an allograft which replaces the role of the ATFL & CFL

- Operative technique
  → Inspect the intraarticular state using an Arthroscopy
  → Additional arthroscopic procedures if needed
  → Lateral ankle stabilization (MBP or LAR using semiT)

<table>
<thead>
<tr>
<th>Arthroscopic procedures</th>
<th>No. of case</th>
<th>Reconstruction technique</th>
<th>No. of case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synovectomy + Microfracture</td>
<td>14</td>
<td>Modified Brostrom procedure*</td>
<td>13</td>
</tr>
<tr>
<td>or Multiple drilling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Synovectomy only</td>
<td>13</td>
<td>Lateral ankle reconstruction§</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>27</td>
<td>Total</td>
<td>27</td>
</tr>
</tbody>
</table>

* : Pants over vest 7 cases / Two anchor technique 6 cases
§ : Lateral ankle reconstruction using semitendinosus allograft

- Jung et al. Foot and Ankle Intl., 2015
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- **Arthroscopic assessment**
  - Cartilage injury by arthroscopic examination: modified Outerbridge classification

<table>
<thead>
<tr>
<th>Modified Outerbridge classification</th>
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<tbody>
<tr>
<td>Grade 0</td>
</tr>
<tr>
<td>Grade 1</td>
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<tr>
<td>Grade 2</td>
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<tr>
<td>Grade 3</td>
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<tr>
<td>Grade 4</td>
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</tbody>
</table>

- **Radiographic assessment**
  - Degree of OA change: Takakura stage
    - Y. Tanaka et al, JBJS(Br), 2006 Takakura stage

<table>
<thead>
<tr>
<th>Takakura stage</th>
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<tbody>
<tr>
<td>1</td>
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<tr>
<td>No narrowing of the joint-space, but early sclerosis and formation of osteophytes</td>
</tr>
</tbody>
</table>

| 2 |
| Narrowing of the medial joint space |

| 3 |
| Obliteration of this space with subchondral bone contact |
| 3a : Obliteration of the joint space limited to the med. malleolus |
| 3b : Obliteration extended to the roof of the dome of the talus |

| 4 |
| Obliteration of whole joint space with complete bone contact |
**Results**

Mean instability duration = 86 months  
Mean Duration of pain persistence = 50 months
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- Results - Clinical evaluation

- Results – Radiographic evaluation

- Complications

No revision surgery
TAA, ankle arthrodesis, redo LAR or MBP

Two cases of mild wound problem
Spontaneously resolved during follow up period
Wound discharge c bullae : resolved in 6 weeks
Bullae around wound : resolved in 3 weeks
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- **Modified Brostrom Procedure**
  - Two anchor group (N=6)
    - Pain VAS 6.0 → 1.9
    - AOFAS 65 → 89
    - Karlsson-Peterson 56 → 87
    - Takakura stage: No interval change (I → I)
  - Pants-over-vest group (N=7)
    - Pain VAS 6.2 → 1.7
    - AOFAS 62 → 89
    - K-P 55 → 88
    - Takakura stage
      - I (4 cases), II (2 cases), IIIa (1 case)
      - No interval change

- **Microfracture**
  - No microfracture group (N=13)
    - Pain VAS 5.9 → 1.8
    - AOFAS 64 → 89
    - Karlsson-Peterson 57 → 87
    - Takakura stage
      - 0 (1 case), I (9 cases), II (3 cases),
        - Worsening in 2 cases (I → II, II → IIIa)
  - Microfracture group (N=14)
    - Pain VAS 6.2 → 1.7
    - AOFAS 62 → 89
    - K-P 55 → 88
    - Takakura stage
      - I (10 cases), II (2 cases), IIIa (1 case)
      - No interval change
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• **Discussion**
  - Ligament stabilization → possible reversal of cartilage degeneration d/t chronic unbalanced loading
    - Harrington, JBJS, 1979; Degenerative arthritis of the ankle secondary to longstanding lateral ligament instability
  - Lateral ankle sprains in sports are the main cause of ligamentous posttraumatic ankle osteoarthritis
    - Valderrabano et al, AJSM, 2006; Ligamentous Posttraumatic Ankle Osteoarthritis
  - In our study
    - Significant improvement of pain and functional scores
    - All of the patients were more than satisfied
    - No significant radiographic improvement
  - **Limitation**
    - Relatively short follow up period: mean 45.4 months (range 13-108)
    - Small case number
    - No control group

• **Conclusion**
  - Ligament stabilization c A/S procedure - good outcome without bony correction
  - Even with no improvement in plain radiograph, functional score could be improved
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• **References**