Anterior Tibial Subluxation with ACL Deficient Knees influences the Knee Stability after ACL Reconstruction.

RYOTA TAKASE¹, KAZUHISA HATAYAMA¹, MASANORI TERAUCHI¹
KENICHI SAITO², HIROTAKA CHIKUDA²

¹) Dept. of Orthop. Surg., JCHO Gunma Central Hospital
²) Dept. of Orthop. Surg., Gunma Graduate School of Medicine
Ryota Takase, MD

I have no financial conflicts to disclose.
Introduction

- Anterior tibial subluxation (ATS) in standing full extension was occurred in ACL-deficient knees.

- ATS in full extension was occurred in ACL-deficient knees while maintaining the heels elevated.
  Hatayama K et al. JOSKAS 2011

![Image of knee with anterior tibial subluxation](image-url)
Purpose

- To investigate whether preoperative ATS with ACL deficient knees influences the knee stability after ACL reconstruction

Materials & Methods

Retrospective study

46 patients undergoing ACL reconstruction using semitendinosus tendon
Male : 20   Female : 26
Mean age : 27 y. o. (range 13 to 49)
Lateral radiographs

Under general anesthesia
Both knees in full extension while maintaining the heels elevated
Image intensifier

Both femoral condyle were superimposed

SOURCE: K Hatayama, 2nd JOSKAS 2011
① Hyperextension angle
② intersecion ratio

\[ \text{Intersection ratio} = \frac{a}{b} \times 100 \% \]

Intersection ratio compared with uninjured knee \( \geq 5 \% \) → ATS (+) group

Intersection ratio compared with uninjured knee \(< 5 \% \) → ATS (-) group

SOURCE : K Hatayama, 2nd JOSKAS 2011
Demographic Data

Preoperative factors

- Age (y)
- Sex (Male / Female)
- Time from injury: Subacute group: within 1 year from injury, Chronic group: > 1 year from injury
- Meniscus injury: Medial MM / Lateral LM

Postoperative evaluation

- Side to side difference (SSD) in anterior tibial translation (mm)
- N test
- Lysholm score

Statistical analysis

- Student’s t test
- X² test
- P < .05 was considered significant
## Results

<table>
<thead>
<tr>
<th></th>
<th>ATS ( + ) group ( n = 13 )</th>
<th>ATS ( - ) group ( n = 33 )</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>intersection ratio ( % )</td>
<td>6.6</td>
<td>0.1</td>
<td>-</td>
</tr>
<tr>
<td>Age ( y )</td>
<td>27</td>
<td>27</td>
<td>0.83</td>
</tr>
<tr>
<td>Sex ( Male / Female )</td>
<td>5 / 8</td>
<td>15 / 18</td>
<td>0.67</td>
</tr>
<tr>
<td>Time from injury ( Subacute / Chronic )</td>
<td>9 / 4</td>
<td>31 / 2</td>
<td>0.77</td>
</tr>
<tr>
<td>MM injury</td>
<td>8 ( 62 % )</td>
<td>9 ( 27 % )</td>
<td>0.03</td>
</tr>
<tr>
<td>LM injury</td>
<td>6 ( 46 % )</td>
<td>15 ( 46 % )</td>
<td>0.97</td>
</tr>
<tr>
<td>hyperextension angle ( ° )</td>
<td>0.1</td>
<td>0.8</td>
<td>0.47</td>
</tr>
</tbody>
</table>
### Results

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</tr>
</thead>
<tbody>
<tr>
<td><strong>Postoperative SSD ( mm )</strong></td>
<td>4.1</td>
<td>1.8</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>N test ( + )</strong></td>
<td>46 %</td>
<td>12 %</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Lysholm score</strong></td>
<td>99</td>
<td>98</td>
<td>0.46</td>
</tr>
</tbody>
</table>

- **8 / 13 patients** in ATS ( + ) group had concomitant MM injury.
- **2 / 8 Repair**: mean SSD 4.2 mm  
  SSD > 5 mm 0 / 2 (0 %)
- **6 / 8 Resection**: mean SSD 4.6 mm  
  SSD > 5 mm 3 / 6 (50 %)
This study showed the number of patients with preoperative MM injury was significantly larger in ATS (+) group (P = 0.03).

ATS with ACL deficient knees associates with chondral injuries and meniscal tears.


Preoperative ATS associates with concomitant MM injury in ACL deficient knees.
Postoperative **SSD in anterior tibial translation** was significant difference in ATS (+) group (P < 0.01).

Postoperative **N test ( + )** was significant difference in ATS (+) group (P < 0.01).

Preoperative ATS was risk factor for early graft failure.

This study also revealed ATS adversely affects postoperative anterior and rotation stability.
Discussions

- 8 / 13 patients in ATS (+) group had concomitant MM injury.

| Mean postoperative SSD | Repair : 4.2 mm / Resection : 4.6 mm |

- Postoperative anterior stability was same difference between MM repair and resection.

- But the sample size is small.

Further clinical research is needed to investigate whether treatment for MM injury with ATS influences postoperative knee stability.
**Conclusion**

- Preoperative ATS associated MM injury and influenced knee stability after ACLR.

**References**


