Anterolateral Capsule Injury Did Not Aggravate Rotational Laxity of the Anterior Cruciate Ligament Injured Knees Measured by Quantitative Pivot-shift Evaluation

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OBJECTIVES
The anterolateral capsule (ALC) injury concomitant with the anterior cruciate ligament (ACL) injured-knees has been recently focused with potential effect on the knee rotational laxity.

Some basic in-vitro studies explored the effect of the additional ALC injury on the rotational laxity using a rotational stress test rather than the clinically-used pivot-shift test [1,2,3].

The dynamic rotational instability of the knee is a complex motion and can be reproduced almost exclusively by the pivot-shift test, not by a simple static stress test.

The effect of the ALC injury on the rotational instability should be examined in-vivo by the clinical pivot-shift test [4].

The purpose of this study was to evaluate the rotational laxity by the pivot-shift test using a quantitative measurement in clinical cases, and to compare them between ACL injured knees with and without the ALC injury determined by MRI.

METHODS
Subject: 85 unilateral primary ACL injured patients (40 males and 45 females; age 25 ± 12 y.o.)

Methods: Pivot-shift test was performed under anesthesia just prior to the ACL reconstruction

- Two evaluations of the rotational laxity
  1) Quantitative evaluation
     electromagnetic measurement system (EMS) (Fig.1).
     The tibial acceleration (m/sec²) during the pivot-shift was calculated
  2) Manual evaluation
     the four levels of clinical grading according to the IKDC (none, glide, clunk, and gross).

- Diagnosis of the ALC injury:
  MRI determination according to the report of Helito et al [5]

- Comparison:
  ACL injured-knees with ALC injury group (ALC+) vs ALC intact group (ALC-)

- Statistical analysis:
  Chi-square test and independent t-test respectively
  P-value of <0.05 was considered as statistically significant

RESULTS
Table 1. The demographic data of the patients

<table>
<thead>
<tr>
<th></th>
<th>ALC+ group</th>
<th>ALC- group</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>42 (Male:19, Female:23)</td>
<td>43 (Male:21, Female:22)</td>
<td>0.74</td>
</tr>
<tr>
<td>Age (years old)</td>
<td>26</td>
<td>24</td>
<td>0.23</td>
</tr>
<tr>
<td>Waiting period (days)</td>
<td>275</td>
<td>256</td>
<td>0.44</td>
</tr>
<tr>
<td>Pivot-shift test manual grade</td>
<td>Glide: 21, Clunk: 18, Gross: 3</td>
<td>Glide: 23, Clunk: 17, Gross: 3</td>
<td>0.95</td>
</tr>
<tr>
<td>Lysholm score</td>
<td>77.5</td>
<td>77.7</td>
<td>0.47</td>
</tr>
</tbody>
</table>

Table 2. Results of the evaluation of the rotational laxity (Pivot-shift test)

<table>
<thead>
<tr>
<th></th>
<th>ALC+ group</th>
<th>ALC- group</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceleration (m/sec²)</td>
<td>1.4±1.2</td>
<td>1.6±1.3</td>
<td>0.22</td>
</tr>
<tr>
<td>Translation (mm)</td>
<td>6.6</td>
<td>8.4</td>
<td>0.07</td>
</tr>
</tbody>
</table>

The tibial acceleration measured by EMS during the pivot-shift test demonstrated no significant difference between ALC+ and ALC- groups.

The ALC injury accompanied with the ACL injury did not have significant effect on the rotational laxity based on either clinical grading or quantitative evaluation.

Although the statistical power was not so strong around 0.6, the rotational laxity measurements was slightly larger in the ALC-intact group.

CONCLUSIONS
The clinical impact of the concomitant ALC injury determined by MRI on the rotational laxity was not confirmed in the ACL-injured knees.

We should pay more attention to other common and identifiable injuries like meniscus tear.

DISCLOSURE
We have no conflict to disclose for this study.

ACKNOWLEDGEMENTS
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REFERENCES