MRI Diagnosis of Medial Meniscal Ramp Lesions in Patients with Anterior Cruciate Ligament Injuries

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I have no financial conflicts to disclose.
Ramp lesion

- Longitudinal tears of the medial meniscus posterior horn (MMPH) around the meniscocapsular junction
- The incidence of ramp lesions in ACL-deficient knees is 9.3 to 30.9%
Clinical problems

• Identification of ramp lesions is challenging during standard arthroscopy through the anterolateral portal.

• Diagnosis with MRI is also challenging.

Purpose

1. To prospectively evaluate the sensitivity and specificity of MRI for diagnosing ramp lesions

2. To compare them between 1.5- and 3-T MRI

3. To evaluate whether bone contusion of the posterior lip of the medial tibial plateau was associated with ramp lesions
Materials and Methods

• 155 knees with ACL injury were enrolled in this study.

3-T MRI: 49 knees
1.5-T MRI: 96 knees

Diag. of ramp lesion: High signal irregularity of the capsular margin or separation in the meniscocapsular junction of the MMPH.
Materials and Methods

• 105 knees had an MRI performed within 6 weeks.

Bone contusion of the posterior lip of the medial tibial plateau were evaluated.
• Arthroscope was introduced from the anterolateral portal through the intercondylar notch between the PCL and the medial wall of the intercondylar notch into the posterior medial recess.
The incidence of MM tear

- 81 of 155 knees had MM tears.

- Ramp lesion: 46 knees (29.7%)
- Meniscal body tear: 35 knees (22.6%)

57% of MM tears were ramp lesions in our series.
### Results

- **Table 1. Diagnostic performance of MRI for ramp lesions and body tears.**

<table>
<thead>
<tr>
<th></th>
<th>Ramp lesion</th>
<th>Body tear</th>
<th>( P ) Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity (%)</td>
<td>71.7 (33/46)</td>
<td>94.3 (33/35)</td>
<td>.01</td>
</tr>
<tr>
<td>Specificity (%)</td>
<td>92.7 (101/109)</td>
<td>97.5 (117/120)</td>
<td>.16</td>
</tr>
<tr>
<td>Accuracy (%)</td>
<td>85.8 (134/155)</td>
<td>96.8 (150/155)</td>
<td>.001</td>
</tr>
</tbody>
</table>

Sensitivity and accuracy for ramp lesions was significantly lower than for meniscal body tears.
Results

• Table 2. **Comparison of between 3-T and 1.5-T MRI.**

<table>
<thead>
<tr>
<th></th>
<th>3-T</th>
<th>1.5-T</th>
<th>( P ) Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity (%)</td>
<td>83.3 (10/12)</td>
<td>67.6 (23/34)</td>
<td>N.S</td>
</tr>
<tr>
<td>Specificity (%)</td>
<td>93.6 (44/47)</td>
<td>91.9 (57/62)</td>
<td>N.S</td>
</tr>
</tbody>
</table>

The sensitivity of 3-T MRI was superior to that of 1.5-T MRI, but not significant difference.
Results

- Table 3. Incidence of bone contusions.

<table>
<thead>
<tr>
<th></th>
<th>Ramp lesion</th>
<th>Body tear</th>
<th>No MM tear</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>38.5% (10/26)</td>
<td>40% (8/20)</td>
<td>30.5% (18/59)</td>
</tr>
</tbody>
</table>

Bone contusion on MRI was not associated with ramp lesions.
Conclusion

✓ The sensitivity of MRI for diagnosing ramp lesions was significantly lower than that for medial meniscal body tears.

✓ Even if ramp lesions are not identified on MRI, the transcondylar observation should be routinely performed during surgery so as not to miss lesions.
References


