Evaluation of normal ankle cartilage by MRI T1ρ mapping

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We have no COI with regard to our presentation.
With the recent remarkable progresses in image diagnosis using magnetic resonance imaging (MRI), it could be possible to evaluate articular cartilage in detail.

T1ρ mapping by MRI has recently drawn attention as a noninvasive cartilage evaluation method.
**Purpose**

- While its validity has been proven, there are no reports describing T1ρ mapping for the ankle; therefore, in this present study, T1ρ values of the articular cartilage surfaces of the talar dome were measured in healthy individuals.

**Materials**

- 10 ankles from 10 healthy volunteers (4 male/ 6 female)
- *The mean age was 31.6 years*
Evaluations

• The trochlear ridge (B) of the talus and slices 10 mm anterior (A) and posterior (C) of the ridge.

• Each slice was divided into trisecting (medial, central, and lateral) areas of the articular surface of the trochlea tali.
Measure

- Images taken using a 3.0 T MRI device, manufactured by Philips, were processed using the PRIDE software (Philips, Inc.) and analyzed using Image J, a specialized analysis software.
Results

<table>
<thead>
<tr>
<th></th>
<th>Lateral (L)</th>
<th>Central (C)</th>
<th>Medial (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A; anterior</td>
<td>32.2 ± 6.9ms</td>
<td>31.2 ± 7.2ms</td>
<td>31.0 ± 6.4ms</td>
</tr>
<tr>
<td>B; trochlear ridge</td>
<td>25.1 ± 5.5ms</td>
<td>21.7 ± 5.6ms</td>
<td>24.2 ± 4.2ms</td>
</tr>
<tr>
<td>C; posterior</td>
<td>35.1 ± 4.8ms</td>
<td>31.9 ± 4.5ms</td>
<td>33.8 ± 4.8ms</td>
</tr>
</tbody>
</table>

- This table shows the results of T1ρ values for the medial, central, and lateral regions respectively for the anterior talus, the trochlear ridge of the talus, the posterior talus.
Results

- T1ρ values were significantly lower in the trochlear ridge of the talus than in the anterior and posterior areas of the talar dome.

\[\text{T1ρ value}\]

\*\*p=0.05\*\*

A; anterior
B; trochlear ridge
C; posterior
Discussion

• Proteoglycan content of articular cartilage in the talar dome was determined to be low in the anterior and posterior areas, that reveals load application might be concentrate on these areas.

• The thickness of articular cartilage in the ankle joint has been reported to be 1.00-1.62 mm, that is thinner than that of the knee joint.
Discussion

• It has reported that proteoglycan composition ability of the ankle joint is higher than the knee joint, and the ankle joint cannot receive prevention of proteoglycan composition easily.

• As these reasons, the ankle joint cannot fall into osteoarthritis easily compared with the knee joint.
References


