Background

Radiofrequency ablation (RF) in hip arthroscopy is an increasingly utilized surgical option. Developing safe hip arthroscopy practice patterns is important to minimize any potential thermal damage to the chondrocytes.

Recent case series have linked patient harm from heated fluid irrigation during RF use and chondrolysis associated with RF ablation. A case report of chondrolysis after hip labral repair has not been published.

Chondrolysis can be a devastating complication of RF use. 
- The use of RF during continuous RF use is associated with chondrolysis.
- The safety margin is considered narrow when using RF around cartilage.
- Temperatures of 49°C are damaging to chondrocytes when intra-articular temperatures are cleared from physiological body temperature(50°C), damage begins to occur after an elevation of only 8°C.

The potential for chondrolysis is especially relevant in the hip joint.

Previous research on the safe use of RF is limited.
- Limited saline volume, significant cartilage coverage, potential for poor saline flow, and direct proximity of soft-tissue cartilage to the area of RF use.

Evidence suggests that the primary determinate for maintaining safe intra-articular temperatures is flow rate. The influence of flow rate on temperatures within the hip joint with the usage of radiofrequency ablation has not been published.

To determine the influence of joint fluid lavage with the use of RF in maintaining intra-articular temperatures <50°C.

Our null hypothesis states:
- The continuous use of RF ablation for 90 seconds will not cause the intra-articular fluid temperature ≤50°C.
- Pulsed lavage with no outflow will not affect the intra-articular temperature.
- Ensuring good inflow and outflow.
- Meticulous technique.

Guidelines for using RF should include:

- Palpation technique.
- Incomitant use.
- Ensuring good inflow and outflow.
- Employment of pulsed lavage at frequent intervals.

Methods

• Assessing intra-articular temperatures during continuous RF use

- RF working portal
- Anterior and lateral portals
- Three portal system

The Effect of Radiofrequency Use on Hip Arthroscopy Irrigation Fluid Temperature

Materials

- 3 fresh human cadaveric hips at room temperature
- New Smith and Nephew PIONEERS® RF system
- Luxtron fiberoptic intra-articular thermometers at radial intervals 2, 4, 5 and 9 mm from RF probe tip

Results

Incidence of Chondrocyte Damaging Temperatures

<table>
<thead>
<tr>
<th>Flow Interval (seconds)</th>
<th>Log Odds Significance (p ≤ 0.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>*1.22 (p &lt; 0.0001)</td>
</tr>
<tr>
<td>15</td>
<td>*1.22 (p &lt; 0.0001)</td>
</tr>
<tr>
<td>30</td>
<td>*1.22 (p &lt; 0.0001)</td>
</tr>
<tr>
<td>60</td>
<td>*1.22 (p &lt; 0.0001)</td>
</tr>
<tr>
<td>90</td>
<td>*1.22 (p &lt; 0.0001)</td>
</tr>
</tbody>
</table>

**Effect of Locality and Flow on Temperature**

- Log odds of intra-articular temperatures ≥50°C when compared to no-flow interval: *p < 0.0001*

Log odds of intra-articular temperatures ≥50°C when compared to no-flow interval: *p < 0.0001*

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References