Extrusion in meniscal allograft transplantation

Is the lateral capsular fixation the solution?


ICATME
Hospital Universitario Quirón-Dexeus
Barcelona, Spain
Disclosures

I do not have any conflict of interest related to this presentation
Extrusion & MAT

• 100% of the grafts in abnormal position (extrusion or subextrusion)
  
  Van Arkel. *Arthroscopy* 2000

• MAT more extruded than normal menisci
  
  Verdonk. *KSSTA* 2004, De Coninck 2013

• Extrusion tends to be stable over time
  
  Lee. *AJSM* 2008

Clinically irrelevant
Purpose

Present the MRI findings (grade of graft extrusion) as well as the functional results in a series of lateral meniscal allograft transplantation (MAT) with a soft tissue fixation technique + capsulodesis.

Hypothesis

1º: Capsular fixation would reduce the postoperative degree of allograft extrusion

2º: MAT + capsulodesis would have similar functional results to those obtained in previous series
Methods

• Prospective series → 14 lateral MAT

<table>
<thead>
<tr>
<th>Observations</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Minimum</th>
<th>Maximum</th>
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</thead>
<tbody>
<tr>
<td>Follow up</td>
<td>14</td>
<td>1.61</td>
<td>1.00</td>
<td>2.00</td>
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<tr>
<td>Age</td>
<td>14</td>
<td>40.93</td>
<td>26.00</td>
<td>51.00</td>
</tr>
</tbody>
</table>

- Lysholm, Tegner, KOOS and VAS
- Coronal MRI: Extrusion minor / major (3mm)
- Exclusion: malalignment, Ahlback > III

100% → only sutures + lateral capsulodesis

- Paired Student’s t-Test
- Statistical analysis → SPSS 19 package
- Statistical significance → .05
## Results

### T-test pre and post KOOS

<table>
<thead>
<tr>
<th>Group</th>
<th>Observations</th>
<th>Mean</th>
<th>S.D.</th>
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</thead>
<tbody>
<tr>
<td>Post</td>
<td>14</td>
<td>90.88</td>
<td>7.53</td>
</tr>
<tr>
<td>Pre</td>
<td>14</td>
<td>51.98</td>
<td>2.84</td>
</tr>
<tr>
<td><strong>Diferencia</strong></td>
<td>-38.90</td>
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<td></td>
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<tr>
<td><strong>p-value</strong></td>
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</table>

### T-test pre and post Lysholm

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<tbody>
<tr>
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<td>91.43</td>
<td>6.19</td>
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<td>Pre</td>
<td>14</td>
<td>48.79</td>
<td>13.90</td>
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<td><strong>Diferencia</strong></td>
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### T-test pre and post VAS

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</thead>
<tbody>
<tr>
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<td>14</td>
<td>0.93</td>
<td>1.00</td>
</tr>
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<td>Pre</td>
<td>14</td>
<td>8.21</td>
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Results

T-test pre and post Tegner

<table>
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<th>Observations</th>
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<th>S.D.</th>
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<tr>
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<td>1.45</td>
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<td>Pre</td>
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<td>3.71</td>
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Frequency table of extrusion

<table>
<thead>
<tr>
<th>Extrusion</th>
<th>Frequency</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>Major</td>
<td>4</td>
<td>28.57</td>
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<tr>
<td>Minor</td>
<td>10</td>
<td>71.43</td>
</tr>
</tbody>
</table>

physiological
No study has proven that extrusion has either a deleterious effect on the joint or brings inferior clinical outcomes after MAT.
Reducing the Size of the Meniscal Allograft Decreases the Percentage of Extrusion After Meniscal Allograft Transplantation

Suk Hwan Jang, M.D., Jin Goo Kim, M.D., Ph.D., Jung Gu Ha, M.D., and Jae Chan Shim, M.D.

Greater Axial Trough Obliquity Increases the Risk of Graft Extrusion in Lateral Meniscus Allograft Transplantation

Dae-Hee Lee, Jong-Min Kim, Bum-Sik Lee, Kyung-Ah Kim and Seong-II Bin

An Osteophyte in the Tibial Plateau Is a Risk Factor for Allograft Extrusion After Meniscus Allograft Transplantation

Byeongsam Jeon, Jong-Min Kim, Jong-Min Kim, Chang-Rack Lee, Kyung-Ah Kim and Seong-II Bin

Arthroscopic Centralization of an Extruded Lateral Meniscus

Hideyuki Koga, M.D., Ph.D., Takeshi Muneta, M.D., Ph.D., Kazuyoshi Yagishita, M.D., Ph.D., Toshifumi Watanabe, M.D., Ph.D., Tomoyuki Mochizuki, M.D., Ph.D., Masafumi Horie, M.D., Ph.D., Tomomasa Nakamura, M.D., Ph.D., Atsushi Okawa, M.D., Ph.D., and Ichiro Sekiya, M.D., Ph.D.
Methods ➔ a prospective series of 88 MAT’s

Results ➔ A higher percentage of extruded meniscal tissue was found in the soft tissue fixation group A (P < .001)

A MAT fixed with suture-only technique showed a significantly higher degree of extrusion without influence on the functional outcomes
Lateral Capsular Fixation: An Implant-Free Technique to Prevent Meniscal Allograft Extrusion

Joan C. Monllau, M.D., Ph.D., Maximiliano Ibañez, M.D., Angel Masferrer-Pino, M.D., Pablo E. Gelber, M.D., Ph.D., Juan I. Erquicia, M.D., and Xavier Pelfort, M.D., Ph.D.

Stabilization of the mid-third of the capsule or the remnant meniscus rim to the tibial plateau by means of two 2.4-mm tunnels drilled from the contralateral side of the tibia.

Capsulodesis Versus Bone Trough Technique in Lateral Meniscal Allograft Transplantation: Graft Extrusion and Functional Results

Angel Masferrer-Pino, M.D., Joan C. Monllau, M.D., Ph.D., Maximiliano Ibañez, M.D., Juan I. Erquicia, M.D., Xavier Pelfort, M.D., Ph.D., and Pablo E. Gelber, M.D., Ph.D.

Capsulodesis proved not to be statistically different at decreasing extrusion with respect to the bone-bridge. If the first 4 cases (learning curve) had not been included, the Capsulodesis would have better results relative to the degree of meniscal extrusion compared with the bone-bridge fixation technique.
Limitations

• Small “n”
• No control group
• Short – term follow up

Conclusion

• Soft tissue fixation after capsulodesis, effective at decreasing meniscal extrusion
• Favorable clinical outcomes similar to those found in other series in short-term follow up
References