Recent developments in meniscal treatment

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Findings in the diseased stifle

<table>
<thead>
<tr>
<th>CCL</th>
<th>Lateral Meniscus</th>
<th>Medial Meniscus</th>
</tr>
</thead>
<tbody>
<tr>
<td>79% complete tear</td>
<td>77%</td>
<td>58%</td>
</tr>
<tr>
<td>21% partial tear</td>
<td>Radial tears cranial horn</td>
<td>- ½ bucket handle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- ¼ radial tear</td>
</tr>
</tbody>
</table>


• Visualization and diagnosis
  – Techniques
  – Devices

• Meniscal surgery
  – Instruments for meniscal surgery
  – Techniques
  – Decision making/algorithm
    • Do not harm the patient
    • Dependent on the following CCL technique
    • Patient
    • Client expectation

Meniscus pathologies


• Visualization and diagnosis
  – Techniques
  – Devices

• Meniscal surgery
  – Instruments for meniscal surgery
  – Techniques
  – Decision making/algorithm
    • Do not harm the patient
    • Dependent on the following CCL technique
    • Patient
    • Client expectation

Medial meniscus diagnostic

<table>
<thead>
<tr>
<th>Sensitivity</th>
<th>Arthroscopy</th>
<th>Arthroscopy cranialmedial</th>
<th>Arthroscopy caudalmedial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td>Visual palpation</td>
<td>Visual palpation</td>
<td>Visual palpation</td>
</tr>
<tr>
<td></td>
<td>33%</td>
<td>22%</td>
<td>22.2%</td>
</tr>
<tr>
<td></td>
<td>60%</td>
<td>37%</td>
<td>42.2%</td>
</tr>
</tbody>
</table>

→ Palpation very important
→ Arthroscopy superior to arthrotomy

medial meniscus manually

Medial meniscus Hohmann retractor

Medial meniscus hook

Placing a hook

Joint distraction

Evaluation of a Joint Distractor to Facilitate Arthroscopy of the Canine Stifle

Minimally invasive? In accordance with arthroscopy?
## Tools for distraction

- Leipzig Stifle Distractor
  - STORZ
- Stifle Distractor
  - ARTHREX
- Ventura Stifle Thrust Lever
  - IMEX

## ARTHREX and IMEX Distractor

Anatomical shape for intercondylar notch

## Distraction

Prospective Evaluation of the Leipzig Stifle Distractor

- 3 centres
- 64 stifles
- Pin placement = 84 s (max 160)
- Improvement view = 64/64

<table>
<thead>
<tr>
<th>Manual</th>
<th>LSD</th>
<th>Palpation meniscus</th>
<th>Meniscus pathologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>51/64</td>
<td>64/64</td>
<td>27</td>
<td>37</td>
</tr>
</tbody>
</table>

→ 16 % missed mm tears

## Medial Meniscus after distraction

## Stifle distraction devices

<table>
<thead>
<tr>
<th></th>
<th>Leipzig SD</th>
<th>Arthrex SD</th>
<th>IMEX SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distraction of the medial compartment</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Distraction of the lateral compartment</td>
<td>+/-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Distraction with partial CCL tear</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Not invasive</td>
<td>+/-</td>
<td>+/-</td>
<td>+/-</td>
</tr>
<tr>
<td>Easy application</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Low time for application</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>No assistant needed</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Costs</td>
<td>-</td>
<td>+/-</td>
<td>+</td>
</tr>
</tbody>
</table>
Bucket handle tear

**How to treat:**
- Visualize or displace longitudinal tear

Treated bucket handle tear

**How to treat:**
- Visualize or displace longitudinal tear
- Distract stifle
- Release cranial part of meniscal tear
- Undistract stifle
- Release caudal part of meniscal tear
- Shaving
- Check/palpate for more meniscal tears

**Meniscal release**

- Caudal MR favored; mid body → 60% incomplete MR*
- Meniscal release = Meniscectomy (biomechanically)
- Meniscectomy is a standard animal model to create OA!

**Pros and Cons Meniscal Release**

**Cons**
- Biomechanical function not possible (Pozzi 2006, 2008)
- No functional healing (Luther 2009)
- Does not prevent late meniscal tears (Thieman 2006)
- Leads to meniscal tears, lameness, OA 12w post op (Luther 2009)

**Pros**
- Client satisfaction not negatively influenced (Thieman 2006)
- Reduces risk of latent meniscal tears (Thieman 2006)


**Meniscal Treatment Algorithm**

**Meniscal pathology**

- Damaged tissue accessible → Resection
- Damaged tissue inaccessible → Release

**No Meniscal pathology**

- Low subsequent tear rate → Document and leave intact
- Cannot fully assess high subsequent tear rate → Release

Meniscus diagnostic and stabilizing techniques should be improved
Rehabilitation

- Immobilisation
  - Meniscal stiffness 30% decreased after 8 weeks CCL transection (normal appearance of the meniscus)
  - Reduced meniscal mass
- Early mobilisation
  - Active motion seems more important than weight bearing
  - Prevent meniscal atrophy
  - Better healing of meniscal lesions (more collagen content)
  - Better vascular response (experimental in rabbits)
  - More proteoglycans and beneficial to matrix formation

  "Move it or you'll loose it!" (mantra at rehab courses)

Summary – meniscal treatment

- Diagnostic
  - Visualization
  - Palpation
  - Distraction
- Treatment
  - Preserve caudal rim of the meniscus
  - Do not harm cartilage
  - Critical use of meniscal release
- Rehabilitation
  - Passive movement

Acknowledgement

- ESVOT committee
- Antonio Pozzi
- Peter Böttcher