Meniscal Healing Does Not Correlate With Clinical Symptoms And Outcome Measures: A Clinico-Radiological Analysis

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Introduction

• Meniscal repair surgery: Increasingly common in recent years.

• A consistent predictable outcome is precluded by
  – The precarious vascular supply
  – especially in tears > 2.5cm length

• Assessment of meniscal healing:
  – 2nd look arthroscopy – “Gold standard”
  – Invasive procedure.
Materials and Methods

• Prospective study after IRB approval and Informed consent
• Selection criteria:
  – Arthroscopic meniscal repair for tears larger than 2.5 cm
• Demographics:
  – 40 patients (22M:18F)
  – Mean age 33.4 years (Range 13-68 years)
• Post-surgical follow-up (Min.6 mths):
  – Clinical evaluation noting presence of joint line tenderness, effusion, history of locking and a McMurray’s test.
  – Outcome measures recorded: IKDC, KOOS and Tegner Lysholm scores.
  – Conventional MR imaging (Crues’ criteria)^3
  – Indirect MR arthrography (IMRA) with IV Gadodiamide (0.1mmol/kg).
• Multiple regression analysis was performed for correlation between MR imaging results and clinical scores.
RESULTS

• MRI performed (mean interval of 20.7 months post repair)
• Total 45 repairs evaluated (5 patients had both menisci repaired)
• 33 (82.5%) of the 40 patients had concurrent ACL reconstruction at the time of meniscal repair.
• Indirect MRA
  – Meniscal fully healed: 33 of the 45 meniscal repairs (74%)
  – Meniscus Incomplete healing: 10 (22%) with some granulation tissue
  – Retear at the site of repair: 2 (4%)
• Indirect MRA versus conventional MRI
  – Confirmed findings in 24 (53%) of the 45 meniscal repairs
  – Changed initial “healed” diagnosis to “incomplete healing”: 13(29%)
  – Presence of granulation tissue at repair site: 8(18%) Ongoing healing
• Extent of “healed” repair in all scans measured and compared with original size of tear
Results

• On Indirect MRA
  – Repaired menisci: 30/39 full healing with scar
  – ACL reconstructions:
    • 24/33 fully healed with intact graft
    • 4/33 showed some abnormal tissue signals.

• 20 symptomatic patients (23 repaired tears)
  – 7(33%) incompletely healed/unhealed repair
  – 10 (43.5%) showed healed meniscal repair.

• 20 asymptomatic patients (22 repaired tears)
  – 4(18.2%) showed incomplete healing of meniscal repair on MRI.
Extent of “healing” of repaired tears.

<table>
<thead>
<tr>
<th>Healing</th>
<th>No. of Menisci</th>
<th>Asymptomatic</th>
<th>Symptomatic</th>
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<tbody>
<tr>
<td>100%</td>
<td>28</td>
<td>11</td>
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<td>6</td>
<td>5</td>
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<td>7</td>
<td>4</td>
<td>3</td>
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<td>25%</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>0%</td>
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</tbody>
</table>
Timing of follow up scan

- Never before 12 months post surgery!
  - 3/39 repairs, MRA did not aid in healing status.

- Between 12-18 month post repair (17 patients)
  - Incomplete partial healing: confirmed in 4
  - Unhealed or retear at repair site: confirmed in 3*
  - Other pathologies: 9*

- Beyond 18 months post repair (16 patients)
  - Indirect MRA confirmed findings seen on conventional sequences.

* Symptomatic patients
Outcome measures

• IKDC: 76.3 (range 40.2-98.9)
• KOOS: 86.7 (range 54.2-98.8)
• Tegner-Lysholm: 89.9 (range 71-100)

• Regression analysis:
  – Neither status of meniscal healing nor extent of healed length showed any statistical correlation with clinical scores.
Conclusion

• Poor correlation between MR imaging results and clinical scores.
• Poor correlation between healing status and clinical scores.
• Symptoms in the repaired knee due to
  – A new pathology (re-tear, tear at another location, chondral lesion)
  – Older ignored lesion which has become symptomatic.
• Indirect MR arthrography is beneficial in the evaluation of meniscal repair
Conclusion

• IMRA Confirmed healing of meniscus, avoiding a second look arthroscopy.
  – in 74% of repaired tears
  – in 50% of the symptomatic patients.

• This study establishes the role of Indirect MR arthrography for evaluation of meniscal repair, avoiding the invasive second look arthroscopy, specially between 12 -18 months after surgery.