AMSER Case of the Month
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HPI: 19 M with chronic left knee pain

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Patient Presentation – Subjective Data

• **HPI:** 19 year old male presenting with new onset left knee pain on terminal extension s/p ACL repair with hamstring graft in prior month. Reports worsening left knee pain, ROM, and function with activity in the month since surgery

• **ROS:** Negative except for HPI

• **PMH:** None

• **Medications:** None

• **Family History:** Positive for diabetes, ADHD in second-degree relatives
Patient Presentation – Objective Data

• **Vitals:** WNL

• **Physical Exam:**
  • General appearance: Healthy, well-nourished without deformities
  
  • **Left knee musculoskeletal:**
    • Decreased extension on passive and active range-of-motion
    • Point tenderness in anterior knee
    • Trace swelling/effusion
    • Normal skin, stability, muscle strength, sensation, reflexes, and McMurray’s test

• **Right knee musculoskeletal:**
  • Normal
What Imaging Should We Order?
Select the applicable ACR Appropriateness Criteria

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Procedure</th>
<th>Adult RRL</th>
<th>Peds RRL</th>
<th>Appropriateness Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knee replaced, pain, arthrofibrosis suspected</td>
<td>US knee</td>
<td>0 mSv</td>
<td>0 mSv [ped]</td>
<td>Usually appropriate</td>
</tr>
<tr>
<td></td>
<td>MRI knee without IV contrast</td>
<td>0 mSv</td>
<td>0 mSv [ped]</td>
<td>Usually appropriate</td>
</tr>
<tr>
<td></td>
<td>Radiography knee</td>
<td>&lt;0.1 mSv</td>
<td>&lt;0.03 mSv [ped]</td>
<td>May be appropriate</td>
</tr>
<tr>
<td></td>
<td>CT knee without IV contrast</td>
<td>&lt;0.1 mSv</td>
<td>0.03-0.3 mSv [ped]</td>
<td>Usually not appropriate</td>
</tr>
<tr>
<td></td>
<td>Fluoroscopy knee</td>
<td>&lt;0.1 mSv</td>
<td>Null</td>
<td>Usually not appropriate</td>
</tr>
<tr>
<td></td>
<td>Radiographic arthrography knee</td>
<td>&lt;0.1 mSv</td>
<td>Null</td>
<td>Usually not appropriate</td>
</tr>
<tr>
<td></td>
<td>CT knee with IV contrast</td>
<td>&lt;0.1 mSv</td>
<td>0.03-0.3 mSv [ped]</td>
<td>Usually not appropriate</td>
</tr>
<tr>
<td></td>
<td>MRI knee without and with IV contrast</td>
<td>0 mSv</td>
<td>0 mSv [ped]</td>
<td>Usually not appropriate</td>
</tr>
<tr>
<td></td>
<td>CT knee without and with IV contrast</td>
<td>&lt;0.1 mSv</td>
<td>0.03-0.3 mSv [ped]</td>
<td>Usually not appropriate</td>
</tr>
<tr>
<td></td>
<td>3-phase bone scan knee</td>
<td>1-10 mSv</td>
<td>Null</td>
<td>Usually not appropriate</td>
</tr>
<tr>
<td></td>
<td>FDG-PET/CT whole body</td>
<td>10-30 mSv</td>
<td>3-10 mSv [ped]</td>
<td>Usually not appropriate</td>
</tr>
</tbody>
</table>

This imaging modality was ordered by the sports medicine staff member.
Findings (unlabeled)

T1  PD  T2/STIR Fat Sat
Findings (labeled)
Final Dx:
Localized Anterior Arthrofibrosis – Cyclops Syndrome  
(ACL reconstruction post-operative complication)
Case Discussion

• **Arthrofibrosis:**
  - Excess scar tissue within a joint capsule causing swelling, stiffness, and pain
  - One of the leading causes of failure of total knee arthroplasty
  - It appears as a low signal intensity lesion on T1 and T2 and is often described as mass-like

• **Cyclops Lesion - Presentation:**
  - Cyclops lesions are painful anterior knee masses that arise as a complication of ACL reconstruction (1-9.8% of patients)
    - Typically present 8-32 weeks post-operatively
    - Can also rarely occur in patients with ACL injury without reconstruction
  - The bulbous, discolored appearance resembles a solitary eye during arthroscopy
  - Thought to be due to excessive fibrosis of torn ACL or graft fibers
  - Cyclops Syndrome presents as a decrease in knee extension with associated pain in the presence of a cyclops lesion. It can also present with an audible and palpable “clunk”.
Case Discussion

• Imaging Findings:
  • Best assessed with MRI which has ~85% sensitivity
  • Presents as a soft-tissue mass that sits in the anterior intercondylar notch near the tibial insertion of the reconstructed ACL
  • Low to intermediate signal intensity on all pulse sequences
  • Features variable contrast enhancement with heterogeneous signal

• Differential diagnosis:
  • Intraarticular giant cell tumor of the tendon sheath
  • Nodular synovitis
  • Pseudo-cyclops lesion due to torn ACL graft
Case Discussion

• Management:
  - Treated with arthroscopic surgical debridement
    - Good prognosis with fully recovered function and range of motion
    - Recurrence is rare (1/33 cases in one study)
  - Physical therapy can achieve symptomatic relief
    - Full knee extension cannot be achieved without arthroscopic removal of scar tissue
  - Exercises for restored function include
    - Standing banded knee extension
    - Calf and hamstring stretch with pressure
    - Supine prolonged low-load stretch
References:


