Postoperative Meniscus: Knee
- Meniscal Repair / Meniscectomy

MR Imaging Postoperative Meniscus
Problematic: Standard MR imaging criteria tear – may be normal findings postoperatively
- Variable postoperative morphology
- Surfacing short TE intrameniscal signal

Conventional MR Imaging
- Diagnostic criteria
  - Surfacing intrameniscal T2W fluid signal (high resolution/SNR imaging)
  - Fragmentation, abrupt meniscal contour changes

Direct MR Arthrography
- Imaging contrast imbibition into meniscus = tear
- Potential benefits over conventional MR imaging
  - Distension joint space, Increased intraarticular pressure

Indirect MR Arthrography
- Advocated - Increased conspicuity tears - indirect MR arthrographic effect
  - Assessment meniscal healing – enhancement fibrovascular scar tissue

Diagnostic Signs of Recurrent/Residual Tear Post Meniscal Surgery
- Conventional MR, MR Arthrography - Fragmentation, Surfacing intrameniscal T2W signal
- MR Arthrography - Intrameniscal imbibition contrast material

Persistent Diagnostic Dilema – ↑ intrameniscal signal, ? tear (short TE – Arthrographic acquisitions)
- Potential diagnostic utility CT arthrography (resolution, intrameniscal contrast +/-)

Anterior Cruciate Ligament Reconstruction
- Biologic tissue graft reconstruction
  - Bone-patellar tendon-bone , Hamstring tendon (semitend, gracilis)

Graft Placement
- Femoral/tibial tunnels – Goal → Joint stability (ant translation, rotational)
- Single bundle, Double bundle – anatomic reconstructions
  - Tech reproducibility, Over-crowding notch, difficulties revision
  - Lack of improved (functional, Sx) outcome data vs anatomic single bundle
Early graft signal  <1 year - neoligamentization, vascularization  (↓ by 1-2 yrs postop)  
Variable degrees Persistent  ↑  striated graft signal  > 1-2yrs  can be normal finding  
- Joint stability, clinical/functional assessment

MR Imaging ACL Graft
Instability - Graft Disruption
- Complete tears  T2W Imaging - Complete discontinuity graft fibers
- Partial tears  T2W Imaging - Partial discontinuity, some fibers intact
Instability - Graft Strecthing
- Clinical setting instability – intact graft fibers
- Posterior bowing / buckling graft
Instability - Fixation Failure
- Hardware, Graft migration
Limited Range of Motion – Graft Impingement
- Limitation terminal extension → may lead to graft failure
- Tibial tunnel too anterior, mechanical impingement graft -intercondylar notch
  MR imaging
- Anteriorly positioned tibial tunnel, Graft kinking/angulation - intercondylar roof
- ↑ T1/T2 signal – within distal graft abutting intercondylar shelf
Limited Range of Motion – Arthrofibrosis
- Limitation terminal extension  →  2° to arthrofibrosis anterior compartment knee
- Focal nodular form – “Cyclops Lesion”
  MR imaging
- Focal/diffuse ↓T1, T2 signal material anterior compartment knee
Miscellaneous – Tunnel Expansion
- Etiology – Unknown ? Mechanical, ? Inflammatory
Miscellaneous – Ganglion Cyst Formation
- Etiology - ? Degeneration / Partial tearing graft, ? Precursor graft failure
Miscellaneous – Harvest site complications
- Patella baja , Anterior/Posterior medial – knee pain
- Arthrofibrosis, Patellar fracture, Patellar tendonitis/ tendon rupture

Posterior Cruciate Ligament Reconstruction
- Biologic tissue graft reconstruction – similar to ACL reconstruction
- Graft fixation- Femoral / Tibial tunnels, Tibial inlay
MR Imaging PCL Graft
- Graft disruption, Discontinuity graft fibers, Fluid signal traversing graft

Collateral Ligament Reconstruction
- Extraarticular ligaments - Good healing potential
- Collateral Ligament Repair-Reserved – complete lig disruption + other lig injury
- Suturing, Stapling
MR Imaging Collateral Ligament Repair
- Ligamentous thickening acute/chronic, ↑ T2W signal -diminishing over time
Metallic artifact repair site

References


