MENISCUS TEARS AS WE AGE: DIAGNOSIS AND TREATMENT

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DISCLOSURES

• Board Member FORUM, a women’s orthopaedic sports medicine society
• Institutional Support for Fellowship
  • Smith & Nephew
  • Storz
OBJECTIVES

1. Diagnose an athlete with a meniscus tear
2. Learn the treatment options for a meniscus tear
INTRODUCTION

• The most common reason for knee surgery.

• **Medial meniscus tears more common** than lateral tears
  
  • Older patient degenerative tears occur most commonly in the posterior horn

• In setting of ACL tear, lateral meniscus tear more common
FUNCTION OF THE MENISCUS

**Force Transmission**
- Increases congruency
- Contact area = Loading

**Shock absorption**
- Transmits 50% weight-bearing load in extension and 85% in flexion

**Stability**
- The posterior horn medial meniscus is a secondary stabilizer to anterior translation of the tibia.

**Lubrication**
COMPOSITION

- **Fibroelastic cartilage**
- Interlacing network of collagen, glycoproteins, proteoglycan, and cellular elements
- 65-75% water
- **Collagen** - 90% Type 1 collagen
- **Fibers** - allows meniscus to expand under pressure
  - Radial
  - Longitudinal (circumferential)
    - Dissipates hoop stresses
ANATOMY OF THE KNEE

- **Medial Meniscus**
  - C-shaped with triangular cross section
  - 9-10 mm wide & 3-5 mm thick

- **Lateral Meniscus**
  - More circular
  - Can be discoid
  - Covers more of the articular surface
  - More mobile
  - 10-12 mm wide & 4-5 mm thick
ANATOMY OF THE KNEE

- **Attachments**
  - Transverse (intermeniscal) ligament
    - Anterior
    - Connects medial and lateral meniscus
  - Coronary ligaments
    - Peripheral
    - Lateral meniscus less rigid fixation
  - Meniscofemoral ligament
    - Posterior horn of lateral meniscus to substance of PCL
    - Humphrey Ligament (anteriorly)
    - Ligament of Wrisberg (posteriorly)
CLASSIFICATION

• **Location**
  • Red-Red Zone
    • Outer 1/3, vascularized
  • Red-White Zone
    • Middle third
  • White Zone
    • Inner 1/3, avascular
CLASSIFICATION

- **Pattern**
  - Vertical/longitudinal
  - Oblique/flap/parrot beak
  - Radial
  - Horizontal
  - Complex
  - Bucket Handle
DIAGNOSIS

- **History**
  - Mechanism
    - Twisting injury
    - Degenerative tears may have minimal trauma
  - Pain localized to the medial or lateral joint line
  - Clicking or popping
  - Locking
  - Knee swelling
  - Decreased range of motion
    - Locked knee
PHYSICAL EXAMINATION

- Knee effusion
- Tenderness medial or lateral joint line
  - Most sensitive test
- Decreased range of motion
- McMurray’s Test
  - Flex knee
  - With hand on medial joint line, externally rotate and extend
  - Positive test: palpable click/pop
- Apley’s Compression Test
  - Prone, flexed knee, internal/external rotation
- Thessaly Test
  - Stand with knees at 20 degrees flexion
  - Twist internal and external
  - Pain/clicking: positive test
RADIOGRAPHIC STUDIES

**Radiographs**
- AP, Lateral, notch, sunrise view
- Standing views if possible
- Usually normal

**MRI**
- High Sensitivity - 70-98%
- High Specificity - 74-98%
- Other pathology
  - Discoid Meniscus
  - Baker’s Cyst
TREATMENT

Conservative Treatment
- NSAIDs
- Physical therapy
- Bracing

Surgical Treatment
- Arthroscopy
- Meniscal Debridement
- Meniscal Repair
Meniscus Tear in a Tennis Player

- 20F, varsity tennis player
- Suffered non-contact L knee injury
- C/O knee pain and difficulty with tennis
- Failed conservative management including medication.
- PE
  - + effusion
  - ROM: 0-120
  - + McMurray’s sign
  - + lateral joint line tenderness
  - No instability
Lateral Meniscus

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ARTHROSCOPY OF THE KNEE

Lateral Meniscus Posterior Horn Debridement

Lateral Meniscus Mid Portion Debridement
MENISCAL REPAIR

- **Criteria**
  - Younger age
  - Red red zone
  - Red white zone
  - Size > 1 cm

- **Types**
  - All Inside
  - Inside Out
  - Outside In
MENISCAL REPAIR
FAILED MENISCAL REPAIR

- 25F w/ right knee pain medial joint line
- Hx of gymnastics injury
- Arthroscopy x 2, meniscal repair
- Subjective instability and buckling sensation with activity

Physical exam
- 0-140 degrees
- TTP over MJL
- Positive McMurray’s test
- Bilateral genu varum
FAILED MENISCAL REPAIR

Debridement
DISCOID MENISCUS

- Wide Lateral Joint Space, Squaring off
- Discoid Meniscus
- Bow Tie
- Discoid Meniscus

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Displaced Bucket Handle Tear

Locked knee—Emergent surgery needed

Double Bundle PCL
DISPLACED BUCKET HANDLE TEAR

Displaced Bucket Handle Tear

Reduced and Repaired Meniscus
MENISCUS AS WE AGE

- Increased stiffness
- Decreased elasticity
- Loss of cellular elements
- Increase in fibrous tissue
- Color Changes-yellow

Degenerative Meniscus Tear

15 yr. old

Baker’s Cyst

Arthritis

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CONCLUSIONS

• Meniscus tears are common in athletes.
• Meniscus tears can be treated conservatively, or with surgery including debridement and repair.
• The meniscus changes as we age.


THANK YOU!