The Painful Knee
What Investigations and When to Refer

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Investigation Of Knee Complaints

- History
- Examination
- Provisional Diagnosis
- Advice re Initial Management
- Investigations – Aim to
  - Confirm the provisional diagnosis
  - Aid in management – by GP or specialist

When to Refer

- Diagnosis cannot be reached
  - Still unsure after appropriate investigation
- Initial management has not resulted in satisfactory outcome
  - Still sore beyond expected time to heal
- Require Surgical Management

Case 1 – 10 to 40 Year Old Sport Injury

- History
  - Knee injury
  - Jumped at netball / stepped at touch football
  - Fell – No other player contact
  - Stood to walk off – Knee gave again
    - Could not play on
    - Iced – but swelled (not always a lot)
    - Heard a crack and felt an abnormal movement of knee

Case 1 – Sport Injury

- Examination 2 days later
  - Swollen knee but improved
  - Walking – not quite straightening
  - Complaining of medial tenderness; Sore posterolaterally
  - Ligaments seem OK – but a bit guarded
  - Provisional Diagnosis??
Case 1 – Sport Injury

- **Provisional Diagnosis**
  - ACL Rupture
  - Patella dislocation
  - Bucket Handle Tear of meniscus
  - Tibial Plateau Fracture
  - Chondral or Osteochondral Injury
  - NOT a medial ligament sprain

- **Initial Management**
  - DO NOT Allow a Return to Sport - until diagnosis is made
  - DO NOT Refer to Physio to treat as a medial ligament sprain - Rare without contact
  - DO – Ice, elevate, quads setting exercises
  - DO Make the diagnosis

- **Investigations**
  - MRI if readily available
  - Will differentiate and positively diagnose all in PDx
  - No MRI?
    - Plain X-Ray Views
    - Excludes missing a tibial plateau fracture
    - Look for Osteochondral loose body – from patella dislo
    - Repeat Exam after 10 – 14 days
    - Lachman’s / Pivot Patella apprehension / Tender medial retinaculum
    - Still locked – Send somewhere for MRI
**Osteochondritis Dissecans**

- Commonly result in chondral or meniscal injury after subsequent giving way
- Significant reduction in outcomes of surgery and long term prognosis

**MRI Scan**

- Isolated ACL with Bone Bruising
  - Who do you need to refer?
- Big issue is re-injury – especially in young age group
  - Commonly result in chondral or meniscal injury after subsequent giving way
  - Significant reduction in outcomes of surgery and long term prognosis

**Isolated ACL**

- 30+ - No desire to return to pivoting sport
  - Appropriate physio
  - Education – web / handout
  - Gradual increase in activity
  - Refer if sensation of instability
- Under 30 – Or if wishes to return to pivoting sport
  - Refer to consider surgery
  - Young do badly without Cruciates
Chronic ACL Deficiency

40 Year Old Soccer Player
- Twisted knee during game on Saturday
- Played on without much effort
- Knee not sore at the end of the game
- Celebrated a big win
- Presents with hot swollen painful knee on Monday

Case 2
- Male 40 years of age
- What other history??
  - Gout in the past
  - Inflammation of other joints
  - Similar episodes before
  - Alcohol and dietary factors
    - Beer and prawns to celebrate football win
    - Dehydration
      - Spent Sunday in the garden – 35 degrees

Case 2
- Male 40 years of age
- Examination
Case 2

- Male 40 years of age
- Examination
  - Warm swollen knee
  - Tense effusion
  - Painful to move
  - Afebrile
- Provisional Diagnosis

- Gout / Inflammatory Disease
- Internal Derangement
  - Early OA / Soft tissue lesion
  - Meniscal tear / Chondral delamination
- Infection
  - Rare without penetrating injury or immunocompromise
  - Sick and febrile

Case 2

- Male 40 years of age
- Provisional Diagnosis
- Blood Tests
  - Uric acid is normal
    - Has this helped
    - Should be done at some time but not diagnostic
    - Often confuses but does not aid in diagnosis
  - Inflammatory markers
    - Mild elevation of CRP and ESR expected
    - Infection would have higher markers

Case 2

- Male 40 years of age
- Investigations
  - Ultrasound Scan
  - Plain X-Ray
  - MRI Scan
  - Blood Tests
  - Aspirate of joint

Case 2

- Male 40 years of age
- Investigations
  - Ultrasound Scan
    - Rarely ever indicated
    - The best report will confirm an effusion – you know that
    - The last line will state – For further information regarding internal derangement of the joint an MRI is suggested

Case 2

- Male 40 years of age
- Investigations
  - Plain X-Ray
    - What do you ask for?
Case 2

- Male 40 years of age
- Investigations
  - Plain X-Ray
    - What do you ask for?
    - AP erect (It will be done supine unless requested erect)
    - Flexion or notch view
    - Skyline view
    - Lateral
      - Excludes OA
      - Eliminates loose body / OCD / Tumor
      - Worth doing
  - MRI
    - Not indicated initially
    - This case is gout until proven otherwise
    - MRI indicated if gout not proven
    - What will an MRI show in Gout?
    - Pseudogout

Case 2

- Male 40 years of age
- Investigations
  - Aspirate
    - An acceptable rooms procedure
  - When not to aspirate
    - Prosthesis present
    - Skin is cellulitic – Do not enter joint through infected skin
    - If knee is not effused

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Case 2

- Male 40 years of age
- Investigations
  - Aspirate
    - An acceptable rooms procedure
    - If prosthesis joint present
  - What do you ask for?
    - M/C/S
    - Crystals
Case 2

- Male 40 years of age
- Investigations
  - Aspirate
    - An acceptable rooms procedure
    - What do you ask for?
      - M/C/S + Cell count
    - Put fluid into a lithium heparin tube if available
    - Crystal analysis
    - Pseudogout

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Case 2

- Male 40 years of age
- Investigations
  - Early Management
    - NSAIDs – Indocid
    - Colchicine
    - Cortisone
  - Ongoing Management
    - Check uric acid
    - Prophylaxis
    - Diet / Hydration

Same Presentation – 18 Year old girl

- Gout is not the diagnosis
- History
- Examination
- Provisional Diagnosis?
- Investigation

Investigations

- X-Ray or MRI?
  - X-Ray adequate to exclude calcified tumor / Osteochondritis
  - Probably will be normal
  - Will want an MRI anyway
    - Internal Derangement = Refer on
    - Synovitis and effusion but normal otherwise = Bloods
- Blood Tests
  - FBC, CRP, Urate, HLA B27, ENA, ANA,
  - CCP, Anti DNA, RF

Same Presentation – 18 Year old girl

- Most likely diagnosis
  - Psoriatic Arthritis
  - Psoriatic skin rash may appear after joint pathology
  - JRA
  - Reiter’s in males
    - Chlamydia / Gonococcal / HSV PCR
    - Urethral Swab

Most likely diagnosis

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When to Refer

- Gout Confirmed
  - Local management
  - Prophylaxis and education
  - Large joint involvement
- 40 but not gout
  - MRI and refer
  - 18 and Female – Normal MRI
    - Rheumatologist

When to Refer

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**Case 3 – 55 Years**

**History**
- Recent onset of knee pain
- Might have twisted or squatted
- Some night pain
- Swelling
- Pain medially
- No reported catching locking or crepitus
- Smoker; Angioplasty last year

**Examination**
- Symmetrical alignment of lower limbs
- Near full ROM – tight and painful in deep flexion
- Tender medial joint
- McMurray’s – Sore but non specific
- No crepitus
- Palpable fullness in popliteal fossa
- ??What else

**Provisional Diagnosis**
- Early OA with inflammatory period
- Overweight and Female
- Degenerate meniscal tear
- Spontaneous Osteonecrosis of the Knee
  - Night pain a significant feature
  - Baker’s Cyst
  - ?? Rarities – Tumors etc

**Beware the ischaemic leg**
- Calf pain – May have a leaking baker’s cyst
  - May present as DVT – USS worthwhile
- Claudicant type symptoms
- Rest and Night pain
  - No pulses – Doppler
  - Refer to vascular surgeon
  - Rare but a bad miss
Case 3 – 55 Years

Investigations

- Ultrasound – Rarely useful
  - (Patella Tendinosis)
  - Will show a Baker's Cyst – This is rarely a diagnosis but a secondary filling of the semimembranosus bursa due to synovial fluid tracking from the knee
- Venous or Vascular
  - Reasonable if indicated
  - Ruptured cyst

Venous or Vascular

Investigations

- No clinical evidence of OA - Early at worst
  - MRI is probably most useful (4 month history)
  - Will diagnose SONK and rarities
  - Stages degeneration
  - Shows meniscal lesions and internal derangement

Minor Crepitus / Palpable Osteophyte / Varus deformity

- Short lived symptoms
  - Suspicion of OA – Do X-Ray first
  - Plain films – weight bearing
  - Will confirm severity of OA
  - Minor joint space narrowing but no overt OA
  - Treat Non Operatively
    - Paracetamol / NSAIDs / Physio / Weight Loss
  - MRI Prior to referral

Early and Late Arthritis

- Plain X-Ray – You have the diagnosis
  - Do not do an ultrasound to demonstrate a Baker’s Cyst – They are always present in OA
  - Do not do an MRI scan – unless chasing specific pathology
  - Do not do a CT scan – Unless there is a history of locking and you are looking for a loose body
  - Advise non operative management options
  - Refer when sufficiently troubled

Obvious OA
Anterior Knee Pain

- Clinical Exam
  - Patella Tracking
  - Crepitus
  - Tenderness at inferior patella
  - Jumper's Knee or Patella Tendonitis
- Rehabilitation + Physio
- Not resolving
  - MRI or X-Ray (+ USS for patella tendon)

Sprains Strains and Meniscal Tears

- History
  - Minor injuries – Play on usually
  - Swelling mild and not until the next day
- Exam
  - Persistent tenderness
  - No Instability
  - Not locked – Full ROM
- Investigations
  - None if resolving; MRI if not

Painful TKR

- FBC, ESR, CRP
- Plain X-Ray
- Refer back to surgeon
- Acute onset in previously well functioning knee
  - Infection until proven otherwise
  - Urgent attention; Usually febrile and unwell
- Grumbling knee
  - Difficult diagnosis

Summary

- Ultrasound Scans
  - For DVT or Vascular Compromise
    - May confirm a leaking Baker's Cyst
- Plain X-Ray (Must be weight bearing)
  - For arthritis
  - Trauma to exclude fracture
  - Initial investigation if diagnosis uncertain
  - Orthopaedic tumors
- MRI
  - Internal derangement, cyst or ligament injury
  - Suspected SONK
  - Early OA – Failure of non-operative measures prior to considering surgery
  - No in arthritic knees

- CT Scan
  - Secondary investigation
  - Loose body or tumor
  - Patellofemoral anatomy – prior to stabilisation

- Fluid Analysis
  - Confirm diagnosis of gout
  - Inflammatory conditions
  - Infection

- Blood Tests
  - Inflammatory conditions
  - Absence of local pathology
  - Multiple joint involvement

- TC99 Bone Scan
  - Occult pathology
    - Pain of uncertain origin
    - Provides full survey of skeleton
    - Metastatic disease
    - Activity of suspicious cysts / tumors
  - Shin splints and stress fractures
  - MRI has usurped the use of bone scan as a primary modality