Introduction to Rheumatology

Dr. Christa Visser
MBChB MMed (Med Phys)
Diploma in Orthopaedic Medicine
Rheumatology

- Musculoskeletal Pain (excl. acute trauma)
  - Arthritis
  - Soft tissue rheumatism

- Connective Tissue Diseases eg SLE

- Bone disease eg osteoporosis
Rheumatological Assessment

- LOCAL: Which structure/s are involved?
- SYSTEMIC: Is there any systemic involvement?
Evaluation of Origin of Pain

PAIN

NEUROPATHIC PAIN (neural damage)
- Trauma, toxic, pressure,
- infection, ischaemia,
- nutritional, infiltration

NOCICEPTIVE PAIN (tissue damage)
- Acute or chronic trauma
- Inflammation or infection
- Neoplasm etc
Evaluation of Origin of Pain

PAIN

NEUROPATHIC PAIN (nerve, root, CNS damage)
  Often sensory disturbances
  Sometimes weakness/wasting
  Sometimes abnormal reflexes and tone

NOCICEPTIVE PAIN (tissue damage)
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VISCERAL (Organs)

SOMATIC (Musculoskeletal)
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VISCERAL (Organs)
- Referred from organ eg pancreas, heart, aorta
- Palpation/movement of painful area does not increase the pain

SOMATIC
Evaluation of Origin of Pain

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COMMON SITES OF MUSCULOSKELETAL PAIN

- bursitis
- enthesitis
- tendinitis
- tenosynovitis
- synovitis
- ligament injury
- Capsulitis or capsule injury
TESTING INERT STRUCTURES WITH PASSIVE MOVEMENTS
(LIGAMENT, CAPSULE, RELAXED MUSCLE & TENDON)

- Inflamed/injured tissue relaxed: No pain
- Inflamed/injured tissue stretched: PAIN!!!!
TESTING MUSCULOTENDINOUS UNIT WITH PASSIVE AND RESISTED MOVEMENTS

PASSIVE STRETCH

RESISTED MOVEMENT
Evaluation of Origin of Pain

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LOCAL PAIN (distal and superficial structures)
- Movements stressing the structure causes pain
- Origin in joint or peri-articular soft tissue
- Origin identified by selective tension tests

SOMATIC
- Postures and movements which stress the affected tissue increase the pain

REFERRED FROM SOMATIC STRUCTURE
- Esp proximal structures: eg hip refers to knee
- Movement of 'painful' area does not reproduce pain but movement of the 'originating' area does
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Rheumatological Assessment

• History/Symptoms

• Examination
  – ‘Look’
  – ‘Feel’
  – ‘Move’
Symptoms in Rheumatology

- Pain
- Swelling
- Redness
- Heat
- Stiffness
- Instability
- Deformity
- Functional problems
- Systemic symptoms
‘Look’
(‘Be Careful With Spaghetti’)

- **Bony/Alignment**: eg valgus/varus/ flexion deformity

- **Colour/Skin**: eg red, white, blue, rashes, pigmentation, ulcers, scleroderma etc

- **Wasting**

- **Soft Tissue**: eg joint swelling, nodules
‘Feel’

- Temperature

- Swelling:
  - Synovitis: boggy swelling along joint line
  - Effusion: fluid fluctuation
  - Bone: hard eg Heberden nodules

- Tenderness
‘Move’

- Active

- Passive:
  - Stress inert structures (e.g., ligaments, relaxed muscle)
  - Capsular pattern: pattern of reduction in movements specific for every joint if the joint itself affected

- Resisted:
  - Stress individual muscles and their tendons
Summary

• Exclude neuropathic pain
• Exclude referred pain from viscera
• Identify which musculoskeletal structure is causing pain
  – Local vs referred
  – Joint vs soft tissue
Descriptive Terms

- Synovitis
- Bursitis
- Arthralgia
- Arthritis
- Monoarthritis
- Oligo/pauci-arthritis
- Polyarthritis
- Juvenile arthritis
Descriptive Terms

- Tendonitis/Tendinosis
- Tenosynovitis
- Enthesitis
- Myalgia
- Myositis
- Malaise
Descriptive Terms

- Chondritis
- Chondromalacia
- Osteitis/osteomyelitis
- Osteopaenia
- Osteoporosis
- Osteomalacia
Descriptive Terms

- Early morning stiffness
- ‘Gelling’
- Ankylosis (surgical=arthrodesis)
- Pseudo-instability
- Hypermobility (Beighton scale)
Descriptive Terms

- Varus deformities (cubiti, genu, calcaneo, hallux)
- Valgus deformities (cubiti, genu, calcaneo, hallux)
Descriptive Terms

• Small vs large joint involvement
• Symmetrical vs asymmetrical disease
• Axial disease vs peripheral joint involvement
• Juvenile arthritis: onset < 16 years
Osteoarthritis

• Cartilage softening & degeneration
• Normal blood tests
• Types:
  – Primary: knees, hips, 1st CMC, DIP, PIP, spine
  – Secondary: preceding joint abnormality eg #, dysplasia
Osteoarthritis of the DIP joints with Heberden’s nodes.
Extensive OA with complete loss of the joint space in a concentric pattern and subchondral bone destruction.
Crystal deposition diseases: Gout

- Monosodium urate crystal deposition (tophi) in bone, joints, soft tissue
- Bone and joint destruction (can be very severe)
- Raised serum urate
- Monosodium urate crystals in synovial fluid
An ulcerating tophus of a distal inter-phalangeal joint with associated redness of the overlying skin
Polarized light microscopy: extracellular birefringent needle-shaped urate crystals.
Gout: A large tophus is replacing much of the fifth left metatarsal.
Crystal deposition diseases: Pseudogout/Chondrocalcinosis/ CPPPD deposition disease

- Calcium pyrophosphate dihydrate crystals in joints and soft tissue
- No blood tests
- X-ray: cartilage and soft tissue calcification
- Synovial fluid: CPPD crystals
Tissue Sites of CPPD Deposition

1 - Bursa
2 - Hyaline cartilage
3 - Fibrocartilage
4 - Capsule
5 - Synovium
6 - Tendon

CPPD
SITES OF INVOLVEMENT OF CHRONIC ARTHROPATHY

[Diagram showing sites of involvement with different colors indicating very common and common areas]
‘Bloody old shoulders’. This elderly patient has visible swellings of both shoulders. Aspiration revealed a large amount of blood-stained fluid which contained numerous particles of basic calcium phosphates.
Synovial fluid CPPD crystals.
Knee radiograph showing chondrocalcinosis of both fibrocartilage (meniscus) and hyaline cartilage.
ARThritis

- Osteoarthritis
- Crystal arthritis
- Rheumatoid arthritis
- Spondylarthropathies
- Connective Tissue Diseases
- Vasculitis

- Primary
  - Secondary
  - Gout
  - Pseudogout/Chondrocalcinosis

- Ankylosing spondylitis
- Psoriatic arthritis
- Enteropathic arthritis
- Reactive arthritis

- SLE
  - Systemic sclerosis
  - Poly-/Dermatomyositis
  - MCTD

- Giant cell arteritis
  - Takayasu
  - PAN
  - Wegeners etc
Rheumatoid arthritis

• Synovial inflammation leading to joint destruction
• Joint >>>> Systemic
• Rheumatoid factor often present
• Musculoskeletal
  – Symmetrical arthritis
  – Little spinal involvement except cervical instability
• Early morning stiffness > 1 hour
• Symmetric arthritis
• > 3 Joint arthritis
• Arthritis of one or more of: wrists, MCP’s, PIP’s
• Rheumatoid nodules
• Rheumatoid factor present
• RA X-ray changes: periarticular osteopaenia OR erosions
Osteoarthritis

Crystal arthritis

Rheumatoid arthritis

Spondylarthropathies

Connective Tissue Diseases

Vasculitis

Primary

Secondary

Gout

Pseudogout/Chondrocalcinosis

Ankylosing spondylitis

Psoriatic arthritis

Enteropathic arthritis

Reactive arthritis

SLE

Systemic sclerosis

Poly-/Dermatomyositis

MCTD

Giant cell arteritis

Takayasu

PAN

Wegeners etc
Spondyloarthropathies

- Synovial and enthesial inflammation leading to joint destruction/spinal ankylosis
- Joint>> Systemic
- Musculoskeletal
  - Asymmetric arthritis
  - Sacro-iliac and spinal inflammation and ankylosis
  - Enthesitis
- HLA B 27 often present
Spondylarthropathies

• Types:
  – Ankylosing spondylitis
  – Psoriatic arthritis
  – Enteropathic arthritis
  – Reactive arthritis (Reiters syndrome)
SCHOBER TEST

*MODIFIED SCHOBER TEST

L4  L5

*15 cm

10 cm

*20 cm

15 cm
Distal interphalangeal joint involvement in psoriatic arthritis.
Dactylitis of the index finger.
Ankylosing spondylitis: A radiograph of a macerated specimen demonstrate a typical syndesmophyte bridging the intervertebral disc space. It is thin, vertically oriented and originates from the margins of vertebral bodies.
Enthesopathy at the sites of attachment of the Achilles tendon and plantar aponeurosis
Psoriatic arthritis: DIP joint pencil-in-cup appearance.
Connective Tissue Diseases

- Synovial inflammation stretches capsule and leads to instability but no erosions
- Systemic >>>> Joint
- Musculoskeletal
  - Symmetric arthritis
- Anti-nuclear factor often present
Connective Tissue Diseases

• Types
  – Systemic lupus erythematositis
  – Systemic sclerosis (Scleroderma)
  – Polymyositis/Dermatomyositis
  – Mixed Connective Tissue disease
  – Overlap syndromes
SLE (4/11 criteria)

- Discoid rash
- Malar rash
- Serositis: pleurisy, pericarditis, effusions
- Oral ulcers
- Arthritis: symmetric, nonerosive
- Photosensitivity
- Blood: ↓ WBC  ↓ lympho’s  ↓ plt  Haem anaemia
- Renal: haematuria, proteinuria, casts, failure
- ANF
- Immunologic: + anti Sm
- Neurologic: new seizures, psychosis
Swan neck deformities in a patient with SLE.
Malar rash in a patient with SLE.
Systemic sclerosis

- Raynaud’s phenomenon
- Skin thickening (scleroderma)
- Arthritis and tenosynovitis
- Fibrosis of organs, eg oesophagus, lungs
- Scleroderma renal crisis (HT+failure)
- ANF, Anti-Sm, Anti-centromere often +

A limited form of systemic sclerosis is called CREST syndrome = calcinosis, Raynaud’s, esophageal dysmotility, sclerodactily (scleroderma of distal extremities), telangiectasia
Limited mouth opening and punctate telangiectasias in longstanding limited scleroderma.
Poly- & Dermatomyositis

- Proximal muscle weakness
- Skin rash over hand and face with dermatomyositis
- Arthralgia/arthritis
- Raised CK
- Abnormal EMG
- Abnormal muscle histology
- ANF, Anti-Jo 1 often +
Heliotrope rash of dermatomyositis. The erythematous or violaceous rash over the eyelids of this patient with dermatomyositis and breast cancer is a characteristic cutaneous feature.
Arthritis

OA
- Gout
  - Pseudogout
- OA
  - Primary: DIP
    - PIP, 1CMC, spine, hip, knee, 1 MTP
  - Secondary:
    - OA
- Crystal
  - Cartilage
  - Synovium
- RA
  - Synovium
  - Soft tissue
  - Bone
- SpA
  - Synovium
  - Joint + C-spine
  - Joints >> Systemic
- CTD
  - Synovium
  - Entheses
  - Axial + peripheral joints >> Systemic
- Vasculitis
  - Synovium
  - Systemic >> Joints
  - PAN, Wegeners, Takayasu, GCA, etc

Blood tests N
- XR
- Urate level
- Synovial fluid
- RF
- HLA B27
- ANF
- ENA
- Organ Fx tests
- ANCA
- Histology
- Imaging
<table>
<thead>
<tr>
<th>Rheumatic disorders</th>
<th>Estimated percent prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arthropathies</td>
<td></td>
</tr>
<tr>
<td>Rheumatoid arthritis</td>
<td>1.0</td>
</tr>
<tr>
<td>In children &lt;16 years</td>
<td>0.06</td>
</tr>
<tr>
<td>Osteoarthritis</td>
<td></td>
</tr>
<tr>
<td>Moderate/severe radiographic changes in hands or feet</td>
<td>23.0</td>
</tr>
<tr>
<td>Knee</td>
<td>3.8</td>
</tr>
<tr>
<td>Hip</td>
<td>1.3</td>
</tr>
<tr>
<td>Ankylosing spondylitis</td>
<td>0.1</td>
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<td>0.002</td>
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<tr>
<td>Back troubles</td>
<td>&gt;20.00</td>
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