EVALUATION OF THE PATIENT WITH “ARTHRITIS”

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“Doc, I got arthritis......”

= 

“Doc, I got musculoskeletal pain......”
Within Joint = “Arthritis”
Subchondral bone
Cartilage
Synovial fluid
Synovium

Around Joint = “Periarticular”
Tendon
Tenosynovium
Enthesis
Bursa
Ligament

Away from
Musculoskeletal
System
“Referred”
Visceral
Vascular
Neurologic

Away from Joint
“Non-articular”
Muscle
Bone

Learning objectives

1) Identify key elements from history & exam that allow localization of MSK complaints
2) Differentiate inflammatory & non-inflammatory etiologies of articular disease and know the common diseases in each category
3) Implement a systemic approach to the differential diagnosis of arthritis (monoarticular, oligoarticular, polyarticular)
4) Utilize data from the history & physical to drive the selection of subsequent studies
“Arthritis”
Musculoskeletal Pain

**Arthritis**
- SC bone - AVN
- cartilage - OA
- SF - gout
- synovium - RA

**Periarticular**
- Tendonitis
- Tenosynovitis
- Enthesopathy
- Ligament
- Bursitis
- Other

**Nonarticular**
- Muscle
- Bone

**Referred**
- Visceral
- Vascular
- Neurologic

**History**
- Pain **in joint area**
- Pain in **all** directions of movement

**Physical exam**
- Swelling and tenderness of **entire** joint line
- Limited/painful ROM in **all** directions
- Pain with **active ROM = passive ROM**
- **Effusion=arthritis**
Periarticular Pain

• History
  – Pain localized near joint
  – Pain with some movements

• Physical exam
  – Tenderness/swelling over part of joint
  – Limited/painful ROM in some directions
  – Pain with active ROM > passive ROM

Non-articular Pain: muscle & bone

• “Hurts All Over”
  – Diffuse pain
  – Unrelated to joint ROM
  – Doesn’t fit “pattern”

• Look for
  – typical non-articular patterns
  – non-joint physical findings (e.g. long bone tenderness, tender/trigger points)
Non-articular Pain: Referred

- Visceral pain
- Vascular
- Neurologic pain
  - Symptoms: numbness, paresthesias, burning, weakness
  - Signs: weakness, sensory loss, reflex changes
  - Regional pain (CTS, tarsal tunnel, CRPS)

Musculoskeletal Pain

- Arthritis
- Periarticular
- Nonarticular
- Referred

Inflammatory
- Crystal
- Septic
- RA, CTD
- Spondylos

Noninflammatory
- Osteoarthritis
- Endo/metabolic/other
- Miscellaneous
  - Trauma
  - AVN
  - Neuropathic/Charcot
  - Neoplastic
**Key Historical Elements**

Cardinal signs of inflammation present (including AM stiffness)?

Onset: hyper-acute; acute; chronic (> 6wks)

Course: additive vs. migratory

Specific joint complaints (localization): pain in specific positions; ‘locking’ or ‘giving away’

‘Rheumatic ROS’

Travel history; sick contacts; ‘bad habits’

Key PMH or FH elements: history of IBD, inflammatory eye disease, psoriasis, renal insufficiency, thyroid disease, family history of any of these

Medication review

**Key Exam Elements**

Localization: articular vs. periarticular vs. non-articular

Pain with passive vs. active ROM

Presence of swelling = arthritis (if red/hot joints think crystal or septic; possibly internal derangement)

Pattern: monoarticular, oligoarticular, polyarticular

axial vs. non-axial

symmetric vs. non-symmetric

small joint involvement vs. large

Extra-articular findings: eye, oral/nasal, LN, skin
FOCUS ON:
Inflammatory Arthritis (IA)

Positive signs of inflammation: rubor, color, tumor, dolor
- AM stiffness > 60 min; improved with activity, worse w/ rest

Often associated systemic findings (fever, malaise, lab evidence of inflammation, additional organ involvement)

Symptoms often have a waxing/waning course

Visible swelling described; stiffness ≥ or = pain complaints
- Exam: palpable swelling appreciated
Inflammatory arthritis (IA)

Onset
- Rapid and severe: crystal, septic, palindromic rheumatism (if hyper-acute think non-inflammatory)
- Insidious course: RA, IA associated with CTD, chronic/indolent infection (commonly monoarticular)

Course
- Migratory: ARF, gono/meningococcal, Lyme, sarcoid, Whipples
- Intermittent: crystal, palindromic rheumatism, RA, sarcoid
- Additive: RA classically (polyarticular); SpA may present this way as well (oligoarticular)

Acute Monoarticular IA: ‘Aspirate, or Litigate’

- Non-gonococcal septic arthritis
  - Red-hot weight-bearing joint> other joint; with fever
  - Immunosuppressed or IVDA at increased risk
  - Lyme disease exposure hx (tick bite in endemic area): migratory joint involvement, target skin lesion

- Gonococcal septic arthritis
  - Prodrome: fever, rash, tenosynovitis, migratory arthritis first 2-3 days
  - Joint localization after first 48hrs: may be >1 joint
  - Red, hot knee > wt bearing jts > hands/wrists with fever
  - Past hx pelvic inflammatory disease frequently quiescent at time of presentation of arthritis
Acute Monoarticular IA: ‘Aspirate, or Litigate’

- Gout
  - Red, hot peripheral joint (LE>UE) esp first MTP, onset over hours. May have > 1 joint involved. Peeling of skin after attack
  - Male > age 30, postmenopausal females
  - Asian, alcohol abuse, obesity
- Pseudogout
  - Red, hot knee or wrist > other joints. May be >1 jt.
  - Age >55. Hyperparathyroidism should be ruled out (hemochromatosis, thyroid disease are other possible causes)
- Rarer causes: palindromic rheumatism, hydroxyapatite, RA, JRA, ReA or psoriatic arthritis
Chronic Monoarticular IA

- Fungal, tuberculosis, mycoplasma, Lyme
- Foreign-body synovitis
- Osteomyelitis
- Sarcoid arthritis
- Spondyloarthropathy: ReA, psoriatic
- Children: pauciarticular JIA (evaluate eye for chronic uveitis)

Typically the knee > other joints
Joint redness and fever are variable

All chronic monoarticular inflammatory arthritides need a synovial biopsy with culture if not diagnosed by other means
Oligoarticular IA

- All causes of acute & chronic monoarticular IA can present with more than one joint
  - 80% of septic arthritis is monoarticular (but not 100%!!)
- Seronegative spondyloarthropathies (SpA)
  - Caucasian, males > females, age 15-45, asymmetric joint involvement, enthesitis/dactylitis, last >1 mo
  - Ankylosing spondylitis: hips, back pain, uveitis
  - ReA: asymmetric large joint predominance, LE > UE, toe dactylitis, hx GI/GU infection, conjunctivitis, rash (palms, soles, penile)
  - Psoriatic: UE > LE, DIP involvement, finger dactylitis, rash & nail involvement
  - Enteropathic: knee > other jts
Acute Polyarticular IA

- Viral- only one easily determined is parvovirus
  - Young female with children, daycare worker
  - Rash, small/large joint arthritis, low grade fever
- Hepatitis B > hepatitis C > HIV
  - Risk factors for exposure
  - Urticarial rash, polyarthritis prior to jaundice (Hep B)
- Sarcoid (Lofgren’s syndrome)
  - Young white/Hispanic females
  - Bilateral ankle arthritis, E. nodosum
Acute Polyarticular IA

Rheumatic fever/post streptococcal reactive arthritis
ARF: age 4-15, sore throat, migratory, large > small joint arthritis
PSRA: females > age 18, exposure to children with strep, non-migratory,
large > small joints, no other symptoms of ARF

Polymyalgia rheumatica
Caucasian females, > age 50-60, shoulder & hip pain and stiffness > small
joint involvement, increased ESR (not 100% sensitive, but often the case)

Initial phase of all chronic polyarticular IA and rarer causes (SBE,
paraneoplastic (ovarian))

Vasculitis: usually arthralgias more than arthritis but can see
arthritis in HSP, ANCA-associated vasculitis, cryoglobulinemia
**Chronic polyarthritis IA**

Rheumatoid arthritis (‘the prototype’)
- Symmetric, small joints of hands, wrists, feet

Hepatitis C associated arthritis
- RA-like presentation; arthralgias > arthritis
- Ask about risk factors; Hep C serologies; often RF+, but CCP negative

Connective tissue diseases
- Look for other systemic signs/symptoms
  - SLE: females (9:1), non-Caucasian groups disproportionately affected, symmetric arthritis, hands/wrists/knees, r/o meds (drug-induced lupus)
  - Polymyositis/dermatomyositis, scleroderma, MCTD

Psoriatic arthritis: may present with an RA-like pattern

Adult onset Still’s: high fever, serositis, rash, seronegative, high ferritin
Rheumatic Disease ROS/PE
Important in oligo & polyarticular IA

Fever: septic, crystal, Still’s disease, SLE & RA less commonly (in patients with known SLE or RA, fever = infection until proven otherwise)
Raynaud’s: Scleroderma, SLE/CTD
Alopecia: SLE
Red/painful eyes: Sjogren’s, ReA, AS, RA, sarcoidosis, Behcet’s
Dry mouth/eyes: Sjogren’s
Pleuropericarditis: SLE/CTD, Still’s (and other rare periodic fever syndromes), RA
Pulmonary disease: Scleroderma, SLE, PM/DM, RA, Sjogren’s
Rheumatic Disease ROS/PE
Important in oligo & polyarticular IA

Dermatology: Psoriasis, ReA, Lyme disease (ECM), enteropathic/sarcoid (E. Nodosum), SLE (malar rash/photosensitivity), dermatomyositis, gonococcal, vasculitis, scleroderma, tophi

Oral/nasal ulcers: SLE, ReA, IBD-associated arthritis, Behcet’s, Wegener’s (not hard palate)

Headaches: Giant cell arteritis, SLE, vasculitis, APS

Paresthesias: RA, Sjogren’s, CTS, vasculitis (mononeuritis multiplex classically, but stocking glove possible)

Endocrine disease: thyroid (Hashimoto’s)
Rheumatic Disease ROS/PE
Important in oligo & polyarticular IA

Sore throat: rheumatic fever, Still’s
Diarrhea/stool blood: ReA, enteropathic arthritis
Dysuria/penile/vaginal infection: ReA, gonococcal
CNS Sxs: SLE, vasculitis
Renal Dz: SLE, vasculitis
Habits: alcohol, smoking, drug use, sexual contact, obesity
Risk factors: IV drugs, HIV, hepatitis C
Medications: minocycline (SLE), statins (myopathy),
fluoroquinolones (Achilles tendinitis), others

FOCUS ON:
Non-inflammatory arthritis
Non-inflammatory Arthritis

- History
  - no “believable” red/hot joints
  - slow steady progression
  - mechanical pain: ↑ use, ↓ rest/night
  - no profound/prolonged morning stiffness
  - no systemic findings

- Physical exam
  - swelling:
    - effusion/osteophytes/ligaments
  - crepitus/grating
  - local joint line tenderness

Acute Non-inflammatory Monoarthritis

- Trauma
- Internal derangement (meniscal tear)
- Osteoarthritis
- Hemophilia
- Avascular necrosis
- Sickle cell disease
- Transient osteoporosis of the hip
**Chronic Non-inflammatory Monoarthritis**

Osteoarthritis
Tumors: PVNS (chocolate SF), synovial sarcoma
Charcot: Diabetes, syphilis, syringomyelia
Internal derangement
Others: Avascular necrosis, hemarthrosis (bleeding disorder; coumadin use), synovial chondromatosis

**Non-inflammatory Polyarticular**

OA: bony enlargement/crepitus
Primary OA: Heberden’s (DIP) and Bouchard’s nodes (PIPs), first CMC/MTP, family hx (particularly females)
Other common joints: C-spine, L-spine, hips, knees, AC joint
OA in joints that shouldn’t have it like MCPs, wrists, elbows, shoulder, ankles:
  Hemochromatosis: male >20, post-menopausal females, MCPs, wrists, ankles
  Chronic CPPD disease: > age 55, MCPs, wrists, shoulders (r/o hydroxyapatite)
Non-inflammatory Polyarticular

Hypertrophic osteoarthropathy
   Very painful and acute onset in distal upper & lower extremity joints
   Often seen in patients with lung disease (cancer, etc.)
   Look for clubbing on exam; periarticular fullness; classic periosteal elevation on plain films

Amyloid arthropathy
   Wrists, shoulders, hips
   Dialysis patient (less common with modern dialysis membranes) or elderly patient with monoclonal spike or myeloma
Inflammatory vs Non-inflammatory

- Soft tissue swelling (tumor) +/- effusion
  - AM stiffness > 60min
- Erythema (rubor)
  - Crystal or septic
- Warmth (calor)
- Tenderness (dolor)
  - Pain with rest, at night
- Loss of function (functio laeso)- wax and wane
  - Fatigue and systemic sxs
- Bony swelling
  - Effusion in knee OA
  - AM stiffness < 30min
- No erythema
- Minimal warmth
- Mild tenderness
  - Pain with use
- Variable effect on ADLs
  - Slowly progressive
  - No fatigue or systemic sxs
Musculoskeletal Pain

Arthritis
  - Periarticular
  - Nonarticular
  - Referred

Inflammatory
  - Polyarticular
    1. RA
    2. RA
    3. RA
    SLE/CTD
    Hep B/C/viral
  - Noninflammatory

  - Oligoarticular
    - Spondyloarthopathy
    - Ankylosing spondylitis
    - Reactive arthritis
    - Psoriatic arthritis
    - Inflammatory bowel
  - Monoarticular
    - Septic
    - Gout
    - Pseudogout

Musculoskeletal Pain

Arthritis
  - Periarticular
  - Nonarticular
  - Referred

Inflammatory
  - Polyarticular
    1. OA
    2. OA
    3. OA
    Chronic CPPD
    Rare forms: HPO, amyloid,
    Hemochromatosis, acromegaly,
    ochronosis
  - Noninflammatory

  - Monoarticular
    - Trauma/Internal derangement/OA
    - AVN
    - Sickle cell
    - Bleeding disorders
    - Tumors
    - Charcot joint
“Arthritis”
Musculoskeletal Pain

Arthritis
SC bone - AVN
cartilage - OA
SF - gout
synovium - RA

Periarticular
Tendonitis
Tenosynovitis
Enthesopathy
Ligament
Bursitis
Other

Nonarticular
Muscle
Bone

Referred
Visceral
Neurological

History
PE

THANK YOU!

Questions?
Additional Slides:
Reference Material for
Non-articular Sources of Pain

FOCUS ON:
Periarticular sources of pain
Periarticular Pain

- Diffuse
  - Hypermobility syndrome (R/O Ehlers Danlos): diagnosis made if 3 of 6 criteria met (Beighton criteria)
  - Thumb to forearm
  - Fingers > 90 degrees extension
  - Elbow and/or knee hyperextension > 10 degrees (if both counts as 2)
  - Ankle dorsiflexion > 45 degrees
  - Back flexion with palms flat on floor
- Localized: bursitis, tendonitis, enthesitis

Diffuse Periarticular Pain

Hypermobility Syndrome
Localized Upper Extremity Periarticular Pain

- Shoulder: bicipital tendonitis (Speed’s test), supraspinatus tendonitis, impingement syndrome, subacromial bursitis, frozen shoulder
- Elbow: Lateral and medial epicondylitis, olecranon bursitis (trauma, septic, gout, RA)
- Wrist: DeQuervain’s tendinitis (Finkelstein’s)
- Fingers: Trigger finger
RESISTED WRIST EXTENSION TEST

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Localized Lower Extremity Periarticular Pain

- Hip: true hip pain in groin. If not there then consider trochanteric bursitis (lateral), piriformis syndrome (posterior), ischial bursitis
- Knee: Anserine bursitis (inferomedial), prepatellar bursitis, tensor fascia lata (snapping laterally)
- Ankle: posterior tibial tendonitis (medial pain worse with standing on toes, weak foot inversion with plantarflexion), Achilles tendinitis (R/O fluoroquinolones)
- Feet: heel (plantar fasciitis, Achilles enthesitis), sesamoiditis (under first MTP)
FOCUS ON:
Non-articular sources of pain:
Muscle & Bone

Non-articular pain: muscle & bone

- Acute, localized: muscle (trigger points); bone (stress fracture, osteomyelitis)
- Diffuse muscle pain with weakness:
  - PMR: weakness due to pain
  - Polymyositis: mild pain but severe weakness
  - Medications: statins, colchicine, Plaquenil, AZT, others
- Fibromyalgia: diffuse pain without objective weakness, classic tender points (no longer required for diagnosis)
  - R/O thyroid dz, obstructive sleep apnea, abuse (sex/physical)
  - Diffuse pain for >2 years without objective changes in other organ systems by physical exam, labs, or X-ray is never serious
- Diffuse bone pain: hyperparathyroidism, bone pain related to bisphosphonate use, periostitis (related to HPO or other cause), underlying cancer (pain at night; more common in children)
FOCUS ON:
Referred sources of pain

Referred Pain and/or Weakness

• Visceral: aortic aneurysm causing back pain; GB and shoulder pain
• Hip pain referred to medial knee
• Knee pain stemming from flat foot
• Vascular sources: DVT, arterial insufficiency (claudication, Raynauds)
• Neurologic entrapment syndromes
  – CTS: paresthesias palmar surface 3.5 fingers, Tinel’s and Phalen’s sign, can refer pain to shoulder (Valleix phenomenon)
  – Cubital tunnel (elbow) and tarsal tunnel (foot)
• Neurologic radicular syndromes
  – Consider herpes zoster (shingles)
# UE Radicular Syndromes

<table>
<thead>
<tr>
<th>C5</th>
<th>Weak shoulder abd</th>
<th>Lateral deltoid numb</th>
<th>Decreased biceps reflex</th>
</tr>
</thead>
<tbody>
<tr>
<td>C6</td>
<td>Weak wrist extension</td>
<td>Six shooter numb</td>
<td>Decreased brachioradial</td>
</tr>
<tr>
<td>C7</td>
<td>Weak wrist flex/finger ext(form 7)</td>
<td>Numb middle finger</td>
<td>Decreased triceps reflex</td>
</tr>
<tr>
<td>C8</td>
<td>Weak finger flex(form 8)</td>
<td>Numb ulnar side hand/arm</td>
<td>Decreased finger jerks</td>
</tr>
</tbody>
</table>

# LE Radicular Syndromes

<table>
<thead>
<tr>
<th>L4</th>
<th>Weak quads(4) and foot inverters</th>
<th>Numb inner lower leg and foot</th>
<th>Decreased quad(4) reflex</th>
</tr>
</thead>
<tbody>
<tr>
<td>L5</td>
<td>Weak toe ext(5 toes), hip abd</td>
<td>Numb dorsum of foot and 5 toes</td>
<td>No reflex</td>
</tr>
<tr>
<td>S1</td>
<td>Weak gastroc (up on toes), foot everters</td>
<td>Numb lateral foot</td>
<td>Decreased achille(S1) reflex</td>
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