Approach to a Patient With a Joint Complaint

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Objectives

- To discuss a simple structured approach to a patient with joint complaint
  - To differentiate articular from periarticular
  - To differentiate athralgia from arthritis
  - To differentiate inflammatory from non-inflammatory joint symptoms
- To use history and physical examination to assess the above
- To design initial workup and management of joint pain
- To be familiar with interpretation of key physical findings, serologies and radiographic findings
When you see a patient with joint pain

• Will this go away? (chronic vs self-limiting)
• Will this cause joint damage and disability?
• How can I minimize pain and suffering for this patient?
• What do I do today?
  – Diagnostics?
  – Treatment?
  – Referral?
Three Questions in a Patient with a Joint Complaint

• 1. Is the process articular or periarticular?
• 2. Does the patient have arthralgia or arthritis?
• 3. Are the joint symptoms inflammatory or non-inflammatory?
Q 1: Articular vs Periarticular vs Referred?

- Is the pain truly in the joint?
  - Articular
    - within the joint
  - Periarticular
    - around or outside the joint
  - Referred
    - from another structure
Q1: Articular vs Perarticular?

- Patients with pain in structures around a joint can also present to your clinic with “joint pain”

- Important to distinguish as these are
  - different processes
  - different workup
  - different management
Q1: Articular vs Peri-articular?

Examples of common Periarticular diagnoses

- Bursitis
  - Trochanteric bursitis
  - Olecranon bursitis

- Tendonitis
  - Achilles tendonitis
  - Rotator cuff tendonitis

- Enthesitis
  - Plantar fasciitis
  - Medial/lateral epicondylitis
Q 2: Arthralgia or Arthritis?

- Once you have confirmed true joint (articular) involvement
  - Q2: Does the patient have arthralgia or arthritis?
Q 2: Arthralgia or Arthritis?

- **Arthralgia:**
  - *arthro* - joint
  - *-algos* - pain
  
  Joint pain *only*

- **Arthritis:**
  - *arthro* - joint
  - *-itis* - inflammation

  Joint inflammation/damage

Early PIP swelling
Q 2: Arthralgia or Arthritis?

- Why is this important?

- Arthritis  ➔  True joint disease

- Arthralgia  ➔  Symptom

  (may be unrelated to true joint disease, e.g., depression, hypothyroidism, influenza)
Q 3: Inflammatory vs non-inflammatory

• Once you have defined true arthritis

Q 3: Does the patient have inflammatory or non-inflammatory arthritis?
Q 3: Inflammatory vs non-inflammatory Arthritis

- Inflammatory Arthritis - driven by the immune system
  - Rheumatoid Arthritis
  - Lupus
  - Psoriatic Arthritis
  - Gout

<table>
<thead>
<tr>
<th>System</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rheumatic diseases</td>
<td>- Rheumatoid arthritis</td>
</tr>
<tr>
<td></td>
<td>- Spondyloarthritis (e.g., psoriatic arthritis; reactive arthritis; ankylosing spondylitis; inflammatory bowel disease-associated arthritis)</td>
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<td></td>
<td>- Crystalline arthritis (e.g., gout; pseudogout)</td>
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<td></td>
<td>- Other rheumatic diseases (e.g., SLE; Sjogren syndrome; mixed connective tissue disease; myositis; scleroderma; vasculitis)</td>
</tr>
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<td></td>
<td>- Auto-inflammatory syndromes (e.g., adult-onset Still disease)</td>
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<tr>
<td>Infectious diseases</td>
<td>- Acute infection (e.g., bacterial septic arthritis; viral arthritis; Gonococcal arthritis)</td>
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<tr>
<td></td>
<td>- Subacute infection/chronic infection (e.g., subacute bacterial endocarditis; hepatitis B; hepatitis C; HIV; Lyme; fungal; tuberculosis)</td>
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<tr>
<td>Endocrine diseases</td>
<td>- Thyroid disorders</td>
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<td></td>
<td>- Hemochromatosis</td>
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<tr>
<td>GI causes</td>
<td>- Celiac disease</td>
</tr>
<tr>
<td></td>
<td>- Inflammatory bowel disease-associated arthritis</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>- Paraneoplastic syndromes</td>
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<tr>
<td></td>
<td>- Sarcoidosis</td>
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<td></td>
<td>- Whipple disease</td>
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<td></td>
<td>- Serum sickness</td>
</tr>
</tbody>
</table>
Q 3: Inflammatory vs non-inflammatory

- Non-inflammatory Arthritis – caused by cartilage damage due to injury, trauma or aging

<table>
<thead>
<tr>
<th>Common causes</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Primary osteoarthritis</td>
</tr>
<tr>
<td></td>
<td>• Trauma (e.g., meniscal tear)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Others</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Secondary osteoarthritis (e.g., due to acromegaly, hemochromatosis,</td>
</tr>
<tr>
<td></td>
<td>calcium pyrophosphate deposition disease, ochronosis)</td>
</tr>
<tr>
<td></td>
<td>• Pigmented villonodular synovitis</td>
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<td></td>
<td>• Avascular necrosis</td>
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<tr>
<td></td>
<td>• Hemophilia</td>
</tr>
<tr>
<td></td>
<td>• Sickle Cell disease</td>
</tr>
<tr>
<td></td>
<td>• Neuropathic arthropathy (e.g., Charcot arthropathy)</td>
</tr>
</tbody>
</table>
Patient with a Joint Complaint
The Three Questions

Q 1: Articular vs Peri-articular

Q 2: Arthralgia vs Arthritis

Q 3: Inflammatory vs non-Inflammatory

Articular

Peri-articular vs Referred

Arthralgia

Non-Inflammatory

Inflammatory

Arthritis
Three Questions in a Patient with a Joint Complaint

• Critical distinction between different processes
• Key branching point in
  – directing diagnostic workup
  – management and triage decisions
Question 1
Articular or Peri-articular or Referred
**Q1- History**

**Q1: Articular vs Periarticular vs Referred**

- Determine exact location of the pain

<table>
<thead>
<tr>
<th>Question to ask</th>
<th>Most likely to be caused by joint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where is the pain?</td>
<td></td>
</tr>
<tr>
<td>Groin</td>
<td>True Hip Joint</td>
</tr>
<tr>
<td>Lateral thigh</td>
<td>Trochanteric bursitis</td>
</tr>
<tr>
<td>Buttock / Gluteal</td>
<td>SI joint, Ischial bursa, referred from spine</td>
</tr>
</tbody>
</table>

### Q1 - History

#### Q1: Articular vs Peri-articular vs Referred
- Define activities that make symptoms worse and suggest involvement of specific structures

<table>
<thead>
<tr>
<th>Question to ask</th>
<th>Most likely to be caused by joint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain in “groin/outer thigh”</td>
<td>True Hip Joint</td>
</tr>
<tr>
<td>• Getting into or out of car</td>
<td></td>
</tr>
<tr>
<td>• Getting into or out of bathtub</td>
<td></td>
</tr>
<tr>
<td>• Difficulty in bending over (while sitting) to put on socks/tie shoe laces</td>
<td></td>
</tr>
<tr>
<td>Pain in outer thigh worse with sleeping on that side</td>
<td>Trochanteric bursitis</td>
</tr>
</tbody>
</table>
Q1 – Physical Examination
Location, location, location…

- Ask patient to point with one finger the exact location of pain

<table>
<thead>
<tr>
<th>Joint</th>
<th>Location of pain /corresponding anatomic structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lateral thigh pain</td>
<td>Trochanteric bursa</td>
</tr>
<tr>
<td>Groin pain</td>
<td>True hip joint</td>
</tr>
<tr>
<td>Buttock pain</td>
<td>Ischial bursa, SI joint, Piriformis, Referred from LS spine</td>
</tr>
</tbody>
</table>
Q1 - Physical Examination

Q1- Articular vs Periarticular?
• Be familiar with maneuvers that engage a specific joint/structure

<table>
<thead>
<tr>
<th>Maneuver</th>
<th>Specific Joint /Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>FABER</td>
<td>True hip/ SI pathology</td>
</tr>
<tr>
<td>Tenderness over the T. bursa</td>
<td>Trochanteric bursitis/IT band</td>
</tr>
</tbody>
</table>
Question 2
Arthralgia or Arthritis?
Q2 - History

Once you have defined true articular involvement

Q2- Arthralgia vs Arthritis?

- Ask about joint pain and swelling?

  Yes

  Arthritis
Q2 - Physical Examination

Q2- Arthralgia vs Arthritis?

Joint Examination:

- LOOK for swelling/redness
- FEEL for warmth/heat
- PALPATE for effusion
- MOVE for tenderness and range of motion

Remember that both with arthralgia and arthritis you will illicit joint tenderness
Q2 - Physical Examination

Q2- Arthralgia vs Arthritis?

Swelling in a joint = Arthritis
Question 3

Inflammatory vs non-inflammatory?
Q3 - History

Once you have defined true arthritis

Q3- Inflammatory vs non-inflammatory?
  – Morning stiffness?
  – When are joint symptoms worse?
  – Does movement help or hurt your joints?
Q3 - History

Q3- Inflammatory vs non-inflammatary?

Non-inflammatary Arthritis

- What time of day are joint symptoms worst?
  - Morning
  - Evening

- Does physical activity make joint symptoms better or worse?
  - Better
  - Worse

- Does morning stiffness last for more than 60 minutes?
  - Yes
  - No

Inflammatory Arthritis
Q3 – History

Morning Stiffness

• Cardinal feature of inflammatory arthritis
  – May be variable described by patients
  – “Tin man” vs “need oiling”
• Duration > 60 minutes
• May vary in severity
• May be worse in the evenings
• In some patients, may last for the entire day
• May be present in fibromyalgia
### Q3- Physical Examination

#### Q3- Inflammatory vs non-inflammatory?

- **Articular**
  - Acute inflammation
  - Joint deformities

<table>
<thead>
<tr>
<th>Joint-related physical findings</th>
<th>Likely diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Bony enlargement</td>
<td>Osteoarthritis</td>
</tr>
<tr>
<td>• Heberden nodes</td>
<td></td>
</tr>
<tr>
<td>• Bouchard Nodes</td>
<td></td>
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<tr>
<td>• Crepitus on motion</td>
<td></td>
</tr>
<tr>
<td>• Joint erythema of acute onset</td>
<td>Gout</td>
</tr>
<tr>
<td>• Joint warmth of acute onset</td>
<td>Septic arthritis</td>
</tr>
<tr>
<td>• Ulnar deviation</td>
<td>Injury/Trauma</td>
</tr>
<tr>
<td>• Boutonniere deformities</td>
<td>Rheumatoid arthritis</td>
</tr>
<tr>
<td>• Swan neck deformities</td>
<td></td>
</tr>
<tr>
<td>• Dactylitis</td>
<td>Psoriatic arthritis</td>
</tr>
<tr>
<td></td>
<td>Spondyloarthritis</td>
</tr>
<tr>
<td></td>
<td>Gout</td>
</tr>
</tbody>
</table>
Physical exam clues – not to miss

- Heberden node
- Bouchards

Bony deformities = Hand osteoarthritis
Physical exam clues – not to miss

- Dactylitis

Psoriatic arthritis
Sarcoidosis
Infection
Sickle cell arthritis
Q3 - Physical Examination

Q3: Inflammatory vs non-inflammmatory arthritis

- Extra-articular
  - Look for systemic clues

<table>
<thead>
<tr>
<th>Systemic clinical findings</th>
<th>Likely diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subcutaneous nodules</td>
<td>Rheumatoid arthritis</td>
</tr>
<tr>
<td></td>
<td>Systemic Lupus Erythematosus</td>
</tr>
<tr>
<td></td>
<td>Acute Rheumatic Fever</td>
</tr>
<tr>
<td>Subcutaneous tophi</td>
<td>Gout</td>
</tr>
<tr>
<td>Skin psoriasis</td>
<td>Psoriatic arthritis</td>
</tr>
<tr>
<td>Nail bed pits</td>
<td></td>
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<tr>
<td>Viral Exanthem</td>
<td>Viral arthritis</td>
</tr>
<tr>
<td>Malar Rash</td>
<td></td>
</tr>
<tr>
<td>Alopecia</td>
<td>Systemic Lupus Erythematosus</td>
</tr>
<tr>
<td>Oro-nasal ulcers</td>
<td></td>
</tr>
<tr>
<td>Sclerodactyly</td>
<td>Scleroderma</td>
</tr>
<tr>
<td>Telangiectasias</td>
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</tr>
<tr>
<td>Splinter hemorrhages</td>
<td>Subacute bacterial endocarditis</td>
</tr>
<tr>
<td>Janeway lesions</td>
<td></td>
</tr>
<tr>
<td>Scleritis</td>
<td>Rheumatoid arthritis</td>
</tr>
<tr>
<td></td>
<td>Systemic Lupus Erythematosus</td>
</tr>
<tr>
<td></td>
<td>Vasculitis</td>
</tr>
</tbody>
</table>
Physical Examination
Clues to underlying diagnosis

Extra-articular

• Rashes
  • Psoriasis, malar rash
  – gouty tophi
  – subcutaneous nodules
  – oral ulcers
Diagnostics

In a patient with arthritis
Design a Diagnostic Workup in a Patient with Arthritis

Ideal Diagnostic Workup

- should help further narrow the differential diagnosis
- should be aligned with your pre-test clinical diagnosis
  - to either confirm or rule out suspected diagnostic possibilities
  - guide your decision regarding next steps in management
Serologies in any patient with inflammatory arthritis

- General Screening: Serology

<table>
<thead>
<tr>
<th>General Serologies</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANA</td>
<td>Non-specific</td>
</tr>
<tr>
<td></td>
<td>High titers present in lupus, SS, scleroderma, CTD</td>
</tr>
<tr>
<td>Rheumatoid Factor</td>
<td>Non-specific</td>
</tr>
<tr>
<td></td>
<td>High titers present in RA</td>
</tr>
<tr>
<td>Anti-CCP antibodies</td>
<td>Highly specific for RA</td>
</tr>
</tbody>
</table>
## Diagnostic Workup in inflammatory arthritis

- **Specific Serology**  
  – driven by clinical suspicion

<table>
<thead>
<tr>
<th>Specific Serologies</th>
<th>Clinical symptoms</th>
<th>Present in..</th>
</tr>
</thead>
<tbody>
<tr>
<td>dsDNA antibodies</td>
<td>Oral ulcers, malar rash, photosensitivity, hair loss, serositis, hematuria, proteinura</td>
<td>Lupus</td>
</tr>
<tr>
<td>Anti- Smith antibodies</td>
<td>As above</td>
<td>Lupus</td>
</tr>
</tbody>
</table>
| Anti-Ro / anti-La antibodies | As above  
                           | Dry eyes, dry mouth, RP              | Lupus, Sjogren’s syndrome          |
| Anti-RNP antibodies     | Arthritis, rash, muscle weakness, RP                                              | Overlap syndrome                    |
| Complements C3/C4       | Above lupus symptoms                                                               | Lupus                              |
| ANCA serologies         | Petechial rashes, chronic sinusitis, pulmonary nodules                             | ANCA vasculitis                     |
Diagnostic Workup in any patient with inflammatory arthritis

• Rule out common causes of inflammatory arthritis
  – TSH
  – Hepatitis B, hepatitis C, HIV
  – Others such as parvo, chickungunya, Lyme per clinical suspicion

• General Labs
  – CBC
    • anemia, leukopenia, thrombocytopenia
  – LFTs
  – Serum creatinine
  – Markers of inflammation (ESR and CRP)
  – Serum uric acid (if suspecting gout)
Antibodies you should be familiar with ....
Anti-nuclear Antibodies

• Directed against the nuclear antigens
• Significant titer $\geq 1:160$
• High sensitivity for lupus
  – present in 98-100% of patients with lupus

• Non-specific - present in several diseases and up to 10% of healthy individuals
  – Chronic infections, HIV, hepatitis
  – Thyroid diseases
  – Multiple sclerosis
  – Autoimmune hepatitis, PBC
  – Lymphoma

Clinical Pearl:
Negative ANA rules out lupus
Rheumatoid Factor

- Antibodies directed against Fc portion of IgG
- Present in 70-85% RA patients
- High titers associated with nodular, erosive RA
- Titers do not follow RA activity
- Low specificity for RA
  - Other autoimmune diseases (e.g. Sjogren’s, SLE)
  - Chronic infections: Hepatitis B/C, HIV, syphilis, tuberculosis
  - Chronic lung/liver disease
  - Malignancies: Lymphoma, leukemia
  - Sarcoidosis

Clinical Pearl: Negative RF does not rule out RA
Anti-Citrullinated Peptide Antibodies (Anti-CCP)

- High specificity for RA (>99%)
- High positive predictive value for RA
- Higher sensitivity in early RA (>60%)
- Found in up to 40% of RF negative patients especially early in disease
- Predictive of erosive disease and joint damage

Clinical Pearl:

Positive anti-CCP antibodies = RA

Radiology in workup of arthritis
Radiographic Workup of Inflammatory Arthritis

- X-rays
  May be unrevealing
  To look for erosions in RA and Gout

X-ray characteristics of inflammatory arthritis:
- Erosion
- Joint space narrowing
Radiology in non-inflammatory arthritis

X-ray characteristics of osteoarthritis:
- Osteophytes
- Bony sclerosis (extra bone formation)
- Joint space narrowing

Knee osteoarthritis
When is joint aspiration indicated?

- **Acute monoarthritis**
  - to rule out infection, evaluate for crystals
    - Send for crystals, WBCs, Gram stain and Culture
    - WBC > 20,000 with predominant neutrophils
    - highly suspicious for crystals/infection

- **Chronic monoarthritis**
  - rule out Lyme arthritis
Indication for Referral
When to Refer to Rheumatology

- **RAPID REFERRAL**
  - Inflammatory arthritis > 6 weeks
  - Positive CCP
  - Involvement of MCPs/MTPs
  - High markers of inflammation
  - Any patient with inflammatory back pain
  - Any patient with non-infectious dactylitis

- **DO NOT BE DETERRED BY**
  - Negative blood work or x-rays
    - 40% RA patients negative RF/CCP in early disease
    - 20% of RA patients are seronegative
    - X-rays in RA and spondyloarthritis can be negative in early disease