Approach to Arthritis

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Musculoskeletal disorders are plenty and common in day-to-day practice. Joint pain is just a symptom like fever and the causes can be many. Medical practitioners are at their wits’ end to arrive at a conclusion. In certain cases it takes several months or even years to manifest the real signs and to clinch a diagnosis. Moreover the physician has to distinguish between simple self-remitting conditions from the serious ones that need immediate intervention or early diagnosis to initiate treatment and avert unwanted sequelae. A systematic approach is essential for accurate diagnosis, avoiding unnecessary tests and wrong treatment.

Approach to arthritis (Fig. 1.1, Fig. 1.2) can be classified into 6 steps as follows:

1. Articular or nonarticular pain
2. Acute or chronic
3. Monoarticular or polyarticular
4. Inflammatory or non-inflammatory
5. Symmetrical or asymmetrical; with or without axial involvement
6. Extraarticular manifestations present or absent

Approach to arthritis in children (16 or less years of age) is described elsewhere.
Articular or nonarticular

The physician should first ensure whether the symptoms are pertaining to joints. This can be confirmed by clinical examination. Joint line tenderness and restriction in range of movements are characteristic of joint involvement. There may be tenderness, swelling, deformities, synovial thickening, effusion, crepitus, locking of joints, or bony enlargement. Joint swelling can be due to synovitis or effusion. Synovitis initially causes loss of joint margin on palpation followed by boggy, rubbery or doughy feel with progression of disease.

A number of structures surrounding a joint such as tendons, bursae, muscles and bones may give rise to pain around joints simulating arthritis. This pain is also known as soft tissue rheumatism or regional pain. Referred pain from other structures including viscera (shoulder pain in coronary insufficiency and back pain due to aortic aneurysm), musculo-skeletal pain (hip pain referred to knee) and neuritic pain (complex regional pain) may confuse the issue.

Pain and tenderness in soft tissue rheumatism is focal or localized along anatomical structure. (Table 1.1) Active movements are painful but passive or assisted movements are not. The signs may be remote from the joint line (e.g. tennis elbow) and there is no swelling or crepitus in the joint.

<table>
<thead>
<tr>
<th>Table 1.1 Articular and non-articular pain</th>
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<tbody>
<tr>
<td><strong>Feature</strong></td>
</tr>
<tr>
<td>Pain</td>
</tr>
<tr>
<td>Tenderness</td>
</tr>
<tr>
<td>Active movement</td>
</tr>
<tr>
<td>Passive movement</td>
</tr>
<tr>
<td>Synovitis/Effusion</td>
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<tr>
<td>Crepitus/Instability/Deformity</td>
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Conditions like periarthritis of shoulder, Achilles tendonitis, de Quervain's tenosynovitis, flexor tenosynovitis of palm in diabetes mellitus, Baker's cyst, tennis elbow, golfer's elbow, plantar fasciitis, herpetic neuralgia, diabetic
neuropathy, generalized pain of vitamin D deficiency are some of the examples of non-articular painful conditions.

**Monoarticular or polyarticular / Acute or chronic**

Acute arthritis is arthritis of less than 6 weeks duration. Arthritis of more than 6 weeks duration is classified as chronic arthritis. Once it is confirmed that the symptoms and signs are articular, it is imperative to know whether the arthritic condition is affecting a single joint (monoarticular) or multiple joints to make a diagnosis as well formulating the treatment. Acute monoarthritis is characteristic of gout and septic arthritis whereas chronic monoarthritis can occur in osteoarthritis and hemophilia. Monoarthritis, though rare in rheumatoid arthritis (RA), can occasionally be its first manifestation. Acute polyarthritis can be seen in viral arthritis or reactive arthritis whereas chronic polyarthritis is characteristic of RA and other inflammatory connective tissue diseases. Oligoarthritis (4 or less joints) is commonly seen in spondyloarthritides. Thus apart from single or multiple joints, one can apply the yardstick of acute and chronic to help diagnosis.

The extent of articular involvement is based on the number of joints involved and is classified as monoarticular, pauciarticular or oligoarticular (4 or less number of joints) and polyarticular (more than 5 joints). Infectious (including tuberculous), malignant and crystal induced arthritis are often monoarticular. Spondyloarthritis often has oligoarthritis. Spine involvement must be looked for in all cases of asymmetric oligoarthritis or polyarthritis to rule out spondyloarthritis. Polyarticular arthritis is common with RA, systemic lupus erythematosus (SLE) or primary generalized osteoarthritis.

**Inflammatory or noninflammatory**

It is important to look for signs of inflammation such as pain swelling, redness, warmth and tenderness since inflammatory conditions need early diagnosis and aggressive treatment for maximum disease control. Inflammatory arthritis is associated with stiffness in mornings (more than 30 minutes) and
after prolonged rest (gelling-stiffness after brief period of rest or inactivity). Pain and stiffness are relieved by activity and anti-inflammatory drugs. Spontaneous 'flares' are also common in inflammatory arthritides. Inflammatory arthritis is usually accompanied by systemic features such as fever, fatigue, malaise, anorexia, weight loss etc. Such features should be considered as 'red flags' in any case of arthritis. Patients with systemic features need early specialty care.

Most systemic rheumatic disorders such as RA, SLE, reactive arthritis, vasculitis etc. manifest with signs of inflammation. Conditions like osteoarthritis, Charcot's joints, metabolic disorders; certain types of crystal arthropathies usually will not show signs of inflammation. Joint pain worsens with activity in noninflammatory arthritis. Non-inflammatory pain is not associated with swelling or morning stiffness; there are no signs of inflammation and systemic features (Table 1.2).

<table>
<thead>
<tr>
<th>Feature</th>
<th>Inflammatory</th>
<th>Noninflammatory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morning stiffness</td>
<td>Yes (&gt; 30 minutes)</td>
<td>No (gelling only)</td>
</tr>
<tr>
<td>Improvement on joint use</td>
<td>Yes</td>
<td>Worsens on joint use</td>
</tr>
<tr>
<td>Worsening at night</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Flares</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Constitutional features</td>
<td>Yes</td>
<td>Absent</td>
</tr>
<tr>
<td>Acute phase reactants (ESR/CRP)</td>
<td>Raised</td>
<td>Normal</td>
</tr>
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Laboratory tests can help in confirming inflammatory arthritis. These include - elevated ESR/CRP, anemia of chronic disease, leucocytosis, thrombocytosis, raised alkaline phosphatase and reversal of albumin: globulin ratio. These markers are normal or negative in non-inflammatory arthritis. Synovial fluid examination will help sorting out the issue in some cases.

**Symmetrical or asymmetrical**

In polyarticular presentation looking for symmetrical (similar involvement on right and left) or asymmetrical distribution is useful in making a diagnosis. Symmetrical involvement is commonly seen in RA, SLE and primary
generalized osteoarthritis. Asymmetrical arthritis is seen in reactive arthritis, rheumatic fever and psoriatic arthritis. The type of joint involvement also helps in pattern reading (topography). Involvement of large joints like shoulders, hip joints and spine is common with spondyloarthritides such as ankylosing spondylitis. RA can affect cervical spine alone though spine is generally spared in this condition. Symmetrical involvement of small joints such as interphalangeal, metacarpal and carpal joints is common in RA and SLE. Upper limb joint involvement is common in RA and generalized osteoarthritis whereas lower limb joints are more affected in gout and spondyloarthritis.

**Extraarticular manifestations**

After analyzing the above facts and conditions one should make an attempt to look for a number of extraarticular manifestations that give valuable clue to the diagnosis. A detailed physical examination apart from careful history taking is vital. Head to foot physical examination is essential.

**Fig. 1.1 : Approach to monoarthritis**

- **Spine* involvement**
  - Monoarthritis
  - * Inflammatory
  - * Non-inflammatory
  - Associated features, synovial fluid, investigations
    - **Acute**
      - 1. Septic
      - 2. Gout
      - 3. Reactive arthritis
      - 4. Sarcoidosis
    - **Chronic**
      - 1. Infective
      - 2. Crystal induced
      - 3. Rheumatoid arthritis
    - **Acute**
      - 1. Trauma
      - 2. Haemarthrosis
    - **Chronic**
      - 1. Osteoarthritis
      - 2. Neuropathic
      - 3. Malignancy

* Spondyloarthritis, tuberculosis, brucellosis

Alopecia favors SLE; discoid lesions indicate discoid lupus and one can look for scales of psoriasis in the scalp. Salt and pepper spots are seen on forehead and nape of neck in systemic sclerosis. Heliotrope rash is typical on eyelids in patients with dermatomyositis. Exophthalmos and thyromegaly along with other systemic features should be looked for in cases of thyroid disorders.
Small nodules of gout and dark rashes of active lupus can be made out on the pinna of ear. Tender pinna gives a clue to relapsing polychondritis and coral bead appearance along the pinna are seen in multicentric reticulohistiocytosis. Ophthalmic examination is important for impaired vision in patients with spondyloarthritis due to anterior uveitis, dryness and other complications of Sjogren's syndrome as well as for monitoring chloroquin toxicity. Episcleritis and scleritis are seen in RA. Conjunctivitis is common in Reiter's syndrome and hypopyon in Behcet's disease. Dry eyes are associated with dryness of mouth in primary and secondary Sjogren's syndrome. Tightening of lower eyelid with difficulty in eversion and pinched nose with puckered mouth are features of systemic sclerosis. Parotid gland enlargement can occur in Sjogren's syndrome and sarcoidosis. Macroglossia is common in cases of amyloidosis and oral ulcers in Behcet's disease. Palatal ulcers are commonly seen in patients with SLE. Impaired hearing, tender sinuses, hoarseness of voice, saddle nose deformity occur in Wegner's granulomatosis.

Fig. 1.2: Approach to polyarthritis

Reduction in expansion of chest is present in ankylosing spondylitis. Absent peripheral pulses are common in Takayasu's arteritis and nail pitting is seen in psoriatic arthritis. Sclerodactyly is a marker of systemic sclerosis. Purpuric spots are common in small vessel vasculitis and mainly occur in the lower
limbs. Dark small scaly lesions called keratoderma blennorrhagicum can be seen in the lower limbs in Reiter's syndrome. Circinate balanitis occurs in reactive arthritis and genital ulcer in Behcet's syndrome. Digital gangrene is common in vasculitis like polyarteritis nodosa, systemic sclerosis and vasculitis secondary to RA and SLE. Raynaud's phenomenon (sequential blanching, blueness and reactive hyperemia of fingers and toes due to changes in small vessels following cold exposure) is commonly seen in systemic sclerosis, SLE and mixed connective tissue disease (MCTD). Swollen and tender great toe is a characteristic presentation of acute gout. Skin examination may reveal rashes of SLE, thickening and tightening of systemic sclerosis, livedo reticularis of antiphospholipid syndrome and erythema nodosum of sarcoidosis or vasculitis. There are many other features in systemic examination that may help the diagnosis of a rheumatological disorder.

Rheumatological conditions may manifest as or be associated with complaints related to other systems. Interstitial pneumonia is seen in RA, SLE, systemic sclerosis and methotrexate toxicity. Diarrhoea may be associated with spondyloarthritis and dysphagia due to oesophageal dysmotility is common in systemic sclerosis. Recurrent abortions can indicate antiphospholipid syndrome whereas carditis and mononeuritis multiplex can be due to rheumatic fever and small vessel vasculitis respectively. Renal involvement is common in SLE, vasculitis, Sjogren's syndrome and analgesic abuse. Hypertension may be a feature of SLE nephritis, systemic vasculitis or of renal crisis in systemic sclerosis.

Precipitating factors like trauma, antecedent or intercurrent illnesses and drug history have to be elicited. Recent history of viral fever preceding onset of arthritis may give a clue to chikungunya or other viral arthritis. History of drug ingestion is important. Glucocorticoids can cause avascular necrosis and osteoporosis whereas diuretics can precipitate attacks of gouty arthritis.

Some diseases have peculiar articular manifestations. Diabetes mellitus and hypothyroidism are associated with carpal tunnel syndrome, myeloma with back pain, cancer with myositis and chronic kidney disease with gout.
History

Clinical history taking is an art and provides important clues to the diagnosis. Patient demographic profile, chronology of events, pattern of joint involvement and precipitating events can be ascertained by history.

Different age groups manifest different type of arthritis. SLE and reactive arthritis are common in the young, RA and fibromyalgia in the middle age whereas polymyalgia rheumatica and osteoarthritis are common in the elderly. Sex and race also show a predilection for certain types of rheumatic disorders. RA, SLE and fibromyalgia are common in women and spondyloarthritis and gout are common in men. Sarcoidosis and SLE are more common in Asians and Afro-Americans whereas polymyalgia rheumatica and giant cell arteritis are more common in the Caucasian race. Disorders like ankylosing spondylitis, gout and generalized osteoarthritis show familial tendency.

The chronology of events encompassing the onset, evolution and duration gives valuable diagnostic information. Pattern and evolution of joint involvement is highly important in clinical Rheumatology. The onset is generally insidious in RA, fibromyalgia and osteoarthritis. Acute onset is often associated with infectious, crystal or reactive arthritis and symptoms are of less than 6 weeks duration. The evolution of arthritis can vary according to causative disease. It can be migratory as in rheumatic fever, gonococcal or viral arthritis or additive as in rheumatoid or psoriatic arthritis or intermittent as in crystal arthropathies.

The pain may be generalized in some patients and wrongly perceived as arthritis. Diffuse pain is seen with hypothyroidism, uncontrolled diabetes, vitamin D deficiency state, fibromyalgia, and polymyositis.

Laboratory confirmation

After a careful history, physical examination and the approach given above a physician should make attempts to do only essential investigations, which will confirm the clinical suspicion. This also avoids unnecessary irrelevant investigations and time delay. Laboratory and imaging studies further justify the diagnosis as evidence. Investigations also help in monitoring the disease
activity and drug toxicity, excluding other diseases and identifying organ damage.

The basic work up includes a complete blood count with peripheral smear study, inflammatory markers (ESR/CRP), urine examination, biochemical tests for liver and kidney function (serum ALT, creatinine) and immunological investigations like rheumatoid factor. In selected cases tests such as uric acid, anti-cyclic citrullinated peptide antibodies and anti-nuclear antibodies should be ordered as per suspected diagnosis.

Synovial fluid examination is essential in any case of monoartthritis. This helps in ruling out septic arthritis by Gram staining and culture. It is also useful in detecting crystals (with polarized microscopy) in gout and blood in haemarthrosis. Inflammatory synovial fluid is cloudy and contains 2000-50000 cells with > 50% polymorphs.

An appropriate radiological investigation according to the clinical impression fortifies the diagnosis. Imaging in joint disorders includes plain X-rays, ultrasound, CT scan and MRI. Isotope scans are reserved for malignancies or large vessel vasculitis.