



“Why does my left knee hurt?”



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Ashley's case

History

Ashley, a 23-year-old woman presents to the ED with a 3-day history of a painful and moderately swollen left knee. She indicates that she has not experienced any recent trauma, constitutional symptoms, recent infections or previous history of non-traumatic joint pain. There were no other symptoms.

Upon further questioning, Ashley denies IV drug use but when probed about travel history, she indicates that she vacationed in the Caribbean 3 weeks ago. When discussing sexual history, Ashley states that her most recent sexual contact involved unprotected sex with a local man who was part of the staff at the resort where she was vacationing.

Finally, Ashley indicates she is an otherwise healthy young woman who is not taking any medications.

Her vitals are:

- Heart rate: 85 bpm
- Respiratory rate: 14 breaths per minute
- BP: 118/78
- Temperature: 37.6°C

Physical exam

On exam, Ashley has a moderately swollen left knee that is mildly erythematous and warm to the touch. Palpation elicits a positive patellar tap and some tenderness along the joint line. Active range of motion (ROM) is painful and somewhat limited as is passive ROM but no crepitus or locking is noted.

Turn to page 2 to read more about Ashley.

Questions & Answers

1. What is the approach to monoarthritis in the ED?

The information gleaned from a good history and physical examination is crucial to the diagnosis of acute monoarthritis. If pre-existing joint conditions can be excluded (e.g., osteoarthritis), diagnosis in the ED can be directed toward three main etiologies:

- Trauma
- Infection
- Crystal arthropathies

Given the potential for irreversible structural damage, emergency physicians are particularly interested in traumatic and infectious causes. The presence or absence of a traumatic history significantly directs the diagnostic work-up. Patients with traumatic mechanisms should undergo targeted physical examination and radiographic imaging and referral when appropriate.

If trauma is excluded and pain is not better localized to the surrounding soft tissue (e.g., bursitis), diagnostic arthrocentesis is almost always indicated.

Diagnosis of acute infectious monoarthritis is challenging as the classic signs and symptoms of infection (e.g., fever) are often absent at presentation and blood and synovial fluid cultures are also often non-diagnostic. A high degree of clinical suspicion warrants empiric antibiotic treatment and appropriate referral.

In sum, diagnosis of acute monoarthritis in the ED necessitates a comprehensive history (including travel and sexual history) and physical examination. The need for diagnostic arthrocentesis, radiography and referral are directed by the clinical picture.

Ashley's case cont'd

Investigations

- Complete blood count
- Electrolytes
- Urea and creatinine
- Blood culture
- Cervical and oropharyngeal swabs
- Urinalysis
- Arthrocentesis: cell count, gram stain, microscopy, culture

Results

- Routine blood panel: no abnormal results
- Blood culture: pending
- Cervical and oropharyngeal swabs: pending
- Urinalysis: 5-10 white blood cells (WBCs) per high power field
- Arthrocentesis: 8 mL yellow cloudy synovial fluid (60,000 WBCs per mm³ and Gram-negative intracellular diplococci)

Diagnosis

Presumed gonococcal arthritis secondary to disseminated gonococcal infection.

2. What is the differential diagnosis of acute monoarthritis?

Common causes:

- Overuse injury
- Trauma
- Osteoarthritis
- Osteomyelitis
- Septic arthritis (gonococcal arthritis vs. non-gonococcal septic arthritis)
- Crystalline arthropathies (urate, calcium pyrophosphate dihydrate)
- Avascular necrosis (particularly in the elderly)

Less common causes:

- Bone malignancies
- Hemoglobinopathies (e.g., sickle cell crisis)
- Autoimmune disorders (e.g., rheumatoid arthritis, septic arthritis)
- Reactive arthritis (Reiter's syndrome)

Rarer causes:

- Systemic lupus erythematosus
- Foreign-body synovitis
- Sarcoidosis
- Amyloidosis
- Behcet's disease

3. What is gonococcal arthritis?

Gonococcal arthritis is the most common cause of acute monoarthritis in sexually active young people. Classically, patients become infected with *Neisseria gonorrhoeae* through sexual contact. The exact pathophysiology is controversial and depends on both the host and the virulence of the organism.

Gonococcal arthritis has two primary presentations:

- Disseminated gonococcal infection (fever, arthritis, dermatitis and tenosynovitis)
- Isolated suppurative monoarthritis

Interestingly, genitourinary symptoms are noted in only 25% of cases. Women are four times more likely than men to develop gonococcal arthritis likely because of higher rates of asymptomatic gonorrhea. In terms of diagnostic testing, synovial fluid cultures are positive in only 50% of cases. Cultures


of mucosal surfaces such as the genital tract, oropharynx or rectum are of higher yield (80% positive).

4. *How should this patient be managed?*

The diagnosis of acute infectious arthritis can be challenging and a high degree of clinical suspicion warrants empiric antibiotic treatment. This aggressive approach prevents the destruction of the articular surface that can occur in untreated septic arthritis. In the case of gonococcal arthritis, the Centre for Disease Control (CDC) Guidelines for empiric antibiotic therapy have recently changed with third generation cephalosporins replacing fluoroquinolones as the agent of choice because of a recent six-fold increase in fluoroquinolone resistant gonorrhoea. If the offending pathogen is not suggested by history or early diagnostic tests, empiric therapy should include broad-spectrum antibiotics (third generation cephalosporin with or without vancomycin) that are then changed to more targeted therapies as gram stains, cultures and sensitivities become available. Initial therapy should be parenteral. Given that 30% to 50% of patients infected with gonorrhoea are also infected with chlamydia, appropriate testing and antimicrobial therapy for chlamydia should also be initiated.

5. *What is the disposition for this patient?*

Given the potential for joint destruction, some guidelines recommend immediate admission and referral (*e.g.*, rheumatology). However, stable patients with good symptom control can be managed on an outpatient basis with parenteral therapy and close reassessment and follow-up.

With appropriate therapy, there are few long-term negative outcomes associated with acute gonococcal arthritis. 

For references, please contact diagnosis@sta.ca

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