Acute Monoarthritis:

Focus on Septic Arthritis and Its Mimics

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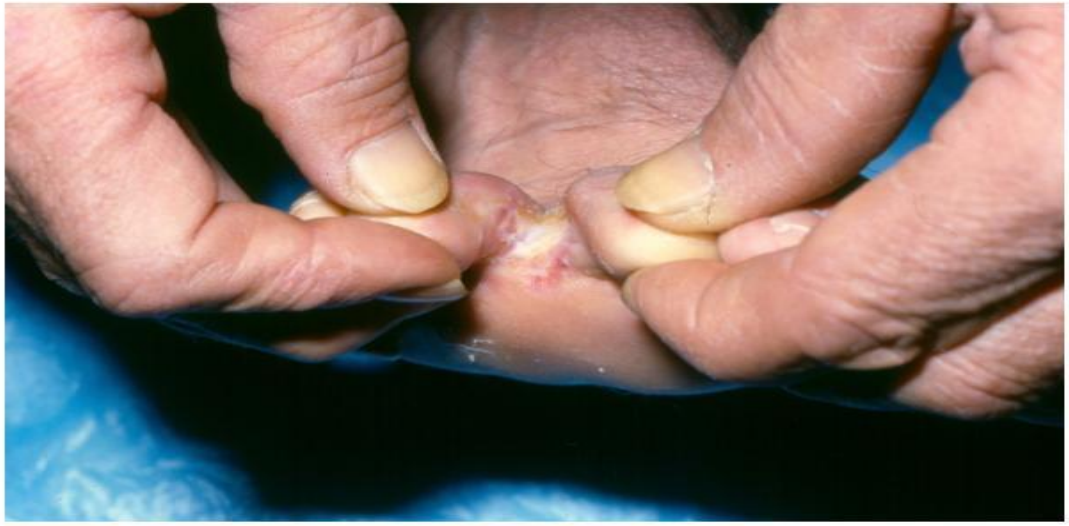
Scenario 1…

- A 48-year-old man with well-controlled type 2 DM presented with acute painful swelling of the left knee for 3 days
  - The pain reached its peak over about a day
  - Unabated despite intake of multiple doses of pain killers
- The patient never experienced similar joint pain in the past
- No FH of joint, skin or eye disease

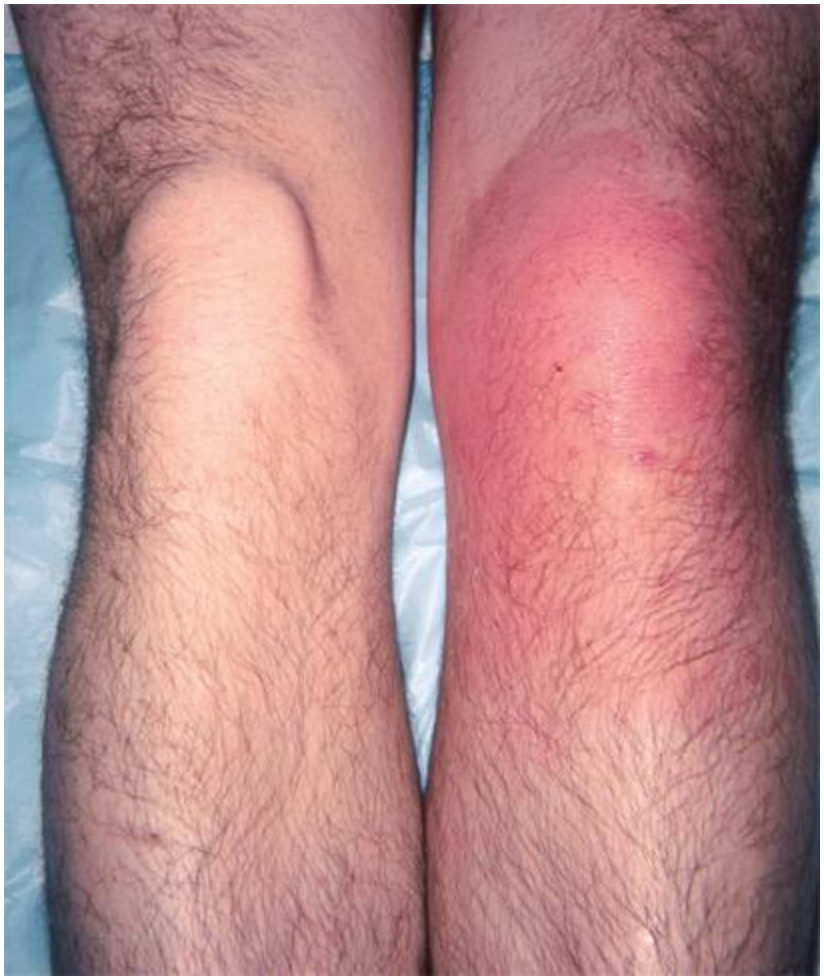
Scenario 1: General Exam…

- Normal body habitus. BP 120/75. Temp 38.5°

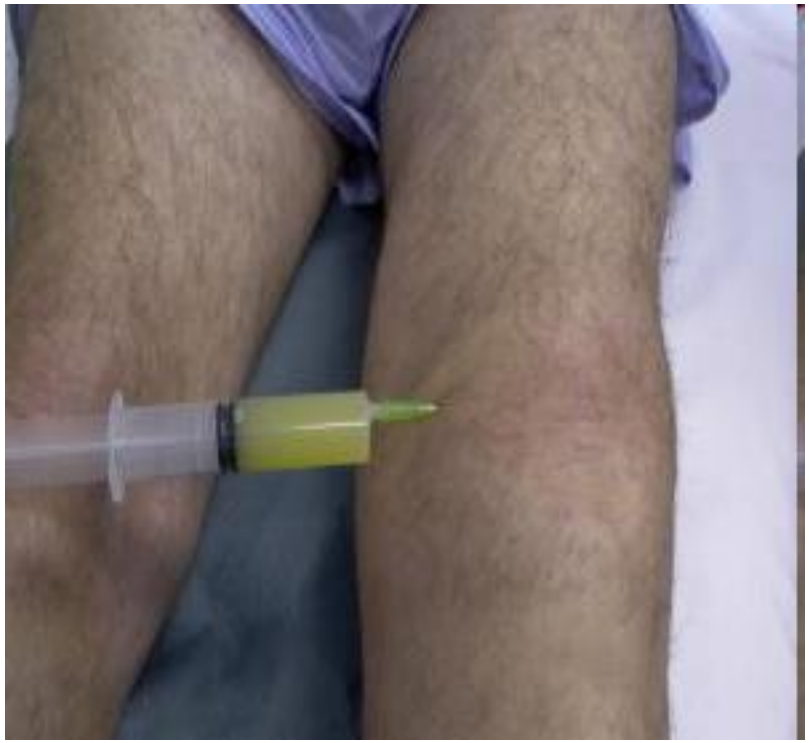


Scenario 1: Systemic…

- Examination of other systems and MSK system other than the lt knee: unremarkable
- CBC: TWBC 17,500; Poly 90%



Joint Aspiration…



Features Important in Septic Arthritis…

- No past episode
- No spontaneous decrease in pain
- Presence of fever and redness over the joint
- H/O recent joint injury
- SF TWBC >$50X10^{9}$/L, 90% of WBCs PMN

Organisms Causing Septic Arthritis…

- *Staph. aureus* (↑ MRSA), *S. epidermidis*
- Streptococci
- *Neisseria gonorrheae*
- Gram –ve aerobic/anerobic organisms

Consequences of Delay in Dx

Bacteremia

Septicemia, severe sepsis/shock

Prolonged suffering

Joint destruction

Disability

A need for prosthetic joint surgery

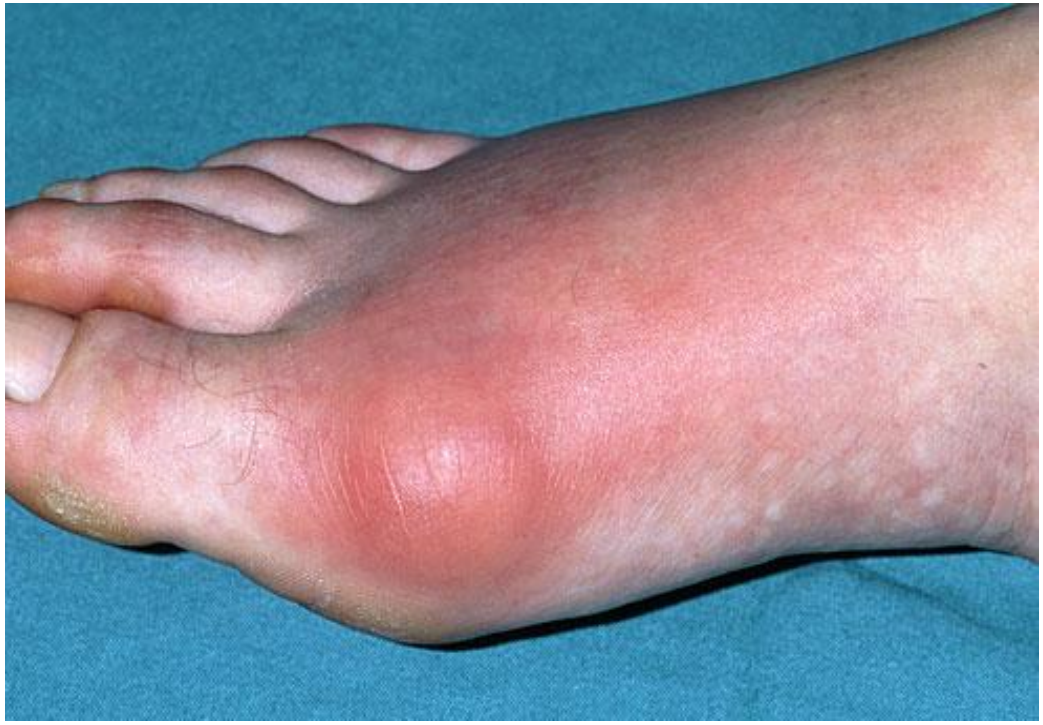
Death

Scenario 2…

- A 38-year-old man presented with severe pain at the root of his right great toe that started at midnight and awakened him
  - It reached maximum intensity over 6 hours
- He had an episode of painful swelling of left ankle 2 yrs ago
  - That episode resolved with 1-day self-treatment with diclofenac
- No FH of joint, skin or eye disease

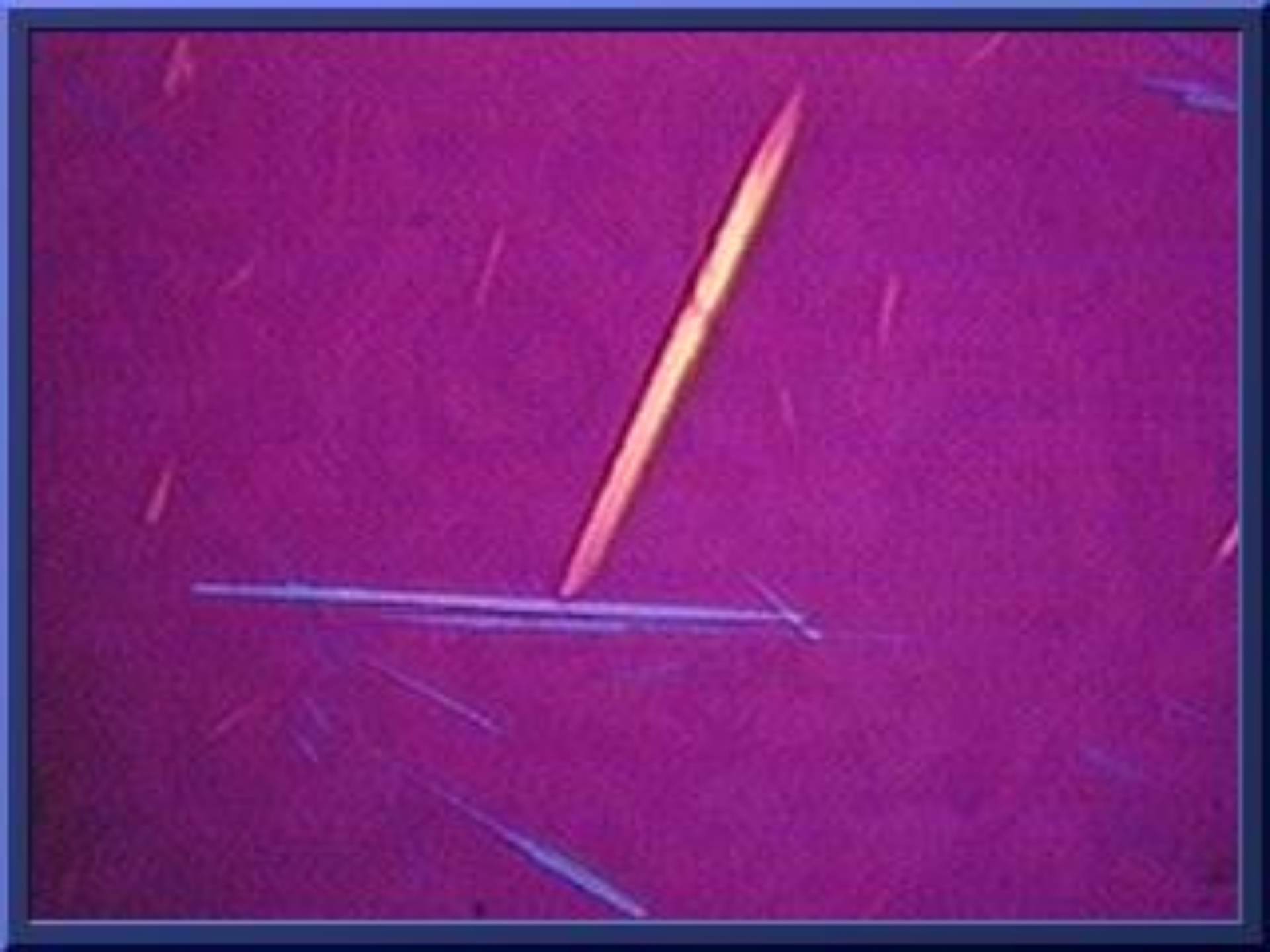
Scenario 2: Examination…

- Mildly overweight. BP 150/95. GE unremarkable



Important Features in Dx of Gout

- Past history of acute monoarthritis
- History of spontaneous resolution of pain
- Presence of tophi
- Raised serum uric acid
- MSU crystals in SF



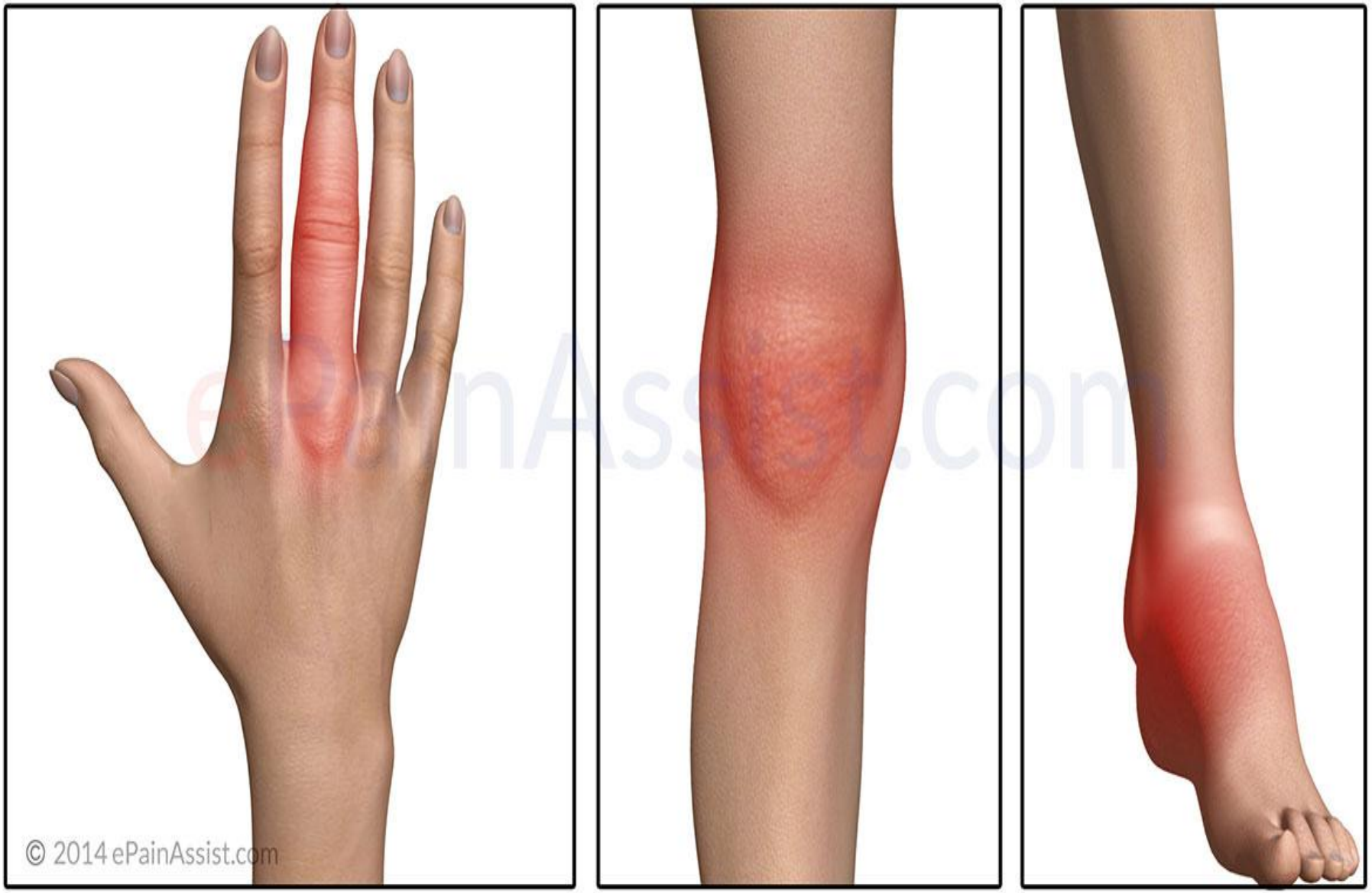
Scenario 3…

- A 28-year-old man has presented with severe pain in PIP of right middle finger since previous afternoon
  - It reached peak in 1 hr
  - Several such episodes involving 1 to 3 joints over last 9 months
  - Duration 2 hours to 7 days, mostly 1-3 days, intervals variable
  - Affected mostly upper limb joints
  - Periarticular areas and muscles as sites in a few of the episodes
  - No residual pain or disability in between
  - No preceding loose motions, urethral discharge, sore throat

Exam and Lab…

- No abnormality on GE, other systems, other parts of MSK system
- ESR 47, RF weakly +ve
- CBC, S uric acid, SI jts normal, anti-CCP and HLA B 27 negative

Palindromic Rheumatism



Other Causes of Acute Monoarthritis

Pseudogout

Trauma: sprain

Hemarthrosis

Osteoarthritis

Reactive arthritis

Psoriatic arthritis

Rheumatoid arthritis

Sarcoidosis

SLE

- Up to 20% of patients presenting with acute knee monoarthritis progress to develop RA

-- *Tenaka et al. Mod Rheuma 2001; 11: 61—64*

- Up to 25% of IBD patients initially present with acute lower limb large joint monoarthritis

-- *Holden et al. Rheum Dis Clin N Am 2003; 29: 513—30*

Approach to the Patient

Steps of Evaluation

History

Physical Examination

Investigation

"The initial approach to diagnosing acute monoarthritis should involve the completion of both a history and a physical examination"

Baker DG & Schumaker HR Jr.
Acute monoarthritis. NEJM 1993; 329: 1013—20.

History

- Socio-demographic background
- Pre-existing chronic illnesses and treatment
- History of present illness:
  - Full description of the pain
  - Summary of other symptoms
  - Systemic enquiry
- Past history
- Family history
- Personal history
- Menstrual history

Physical Examination

General examination

Examination of other systems

Examination of the musculo-skeletal system

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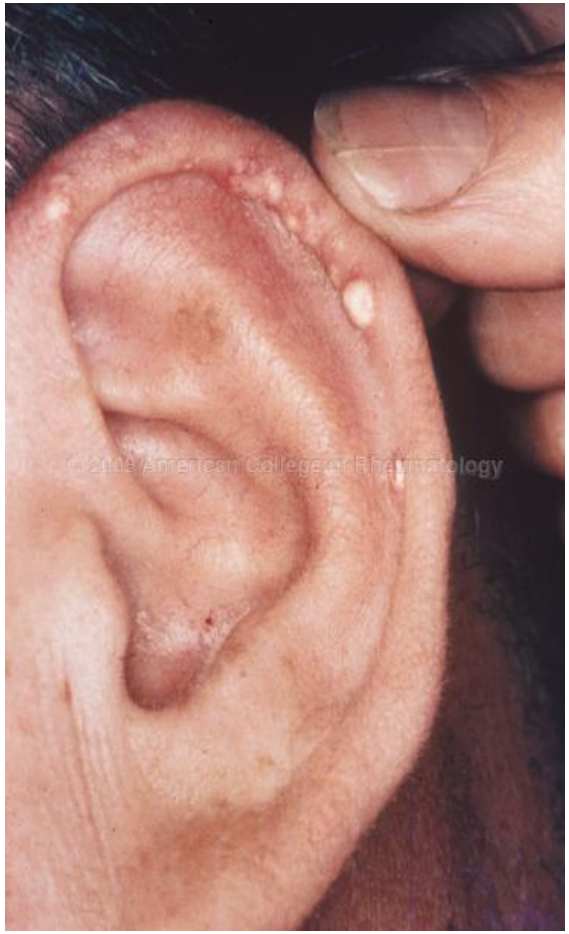
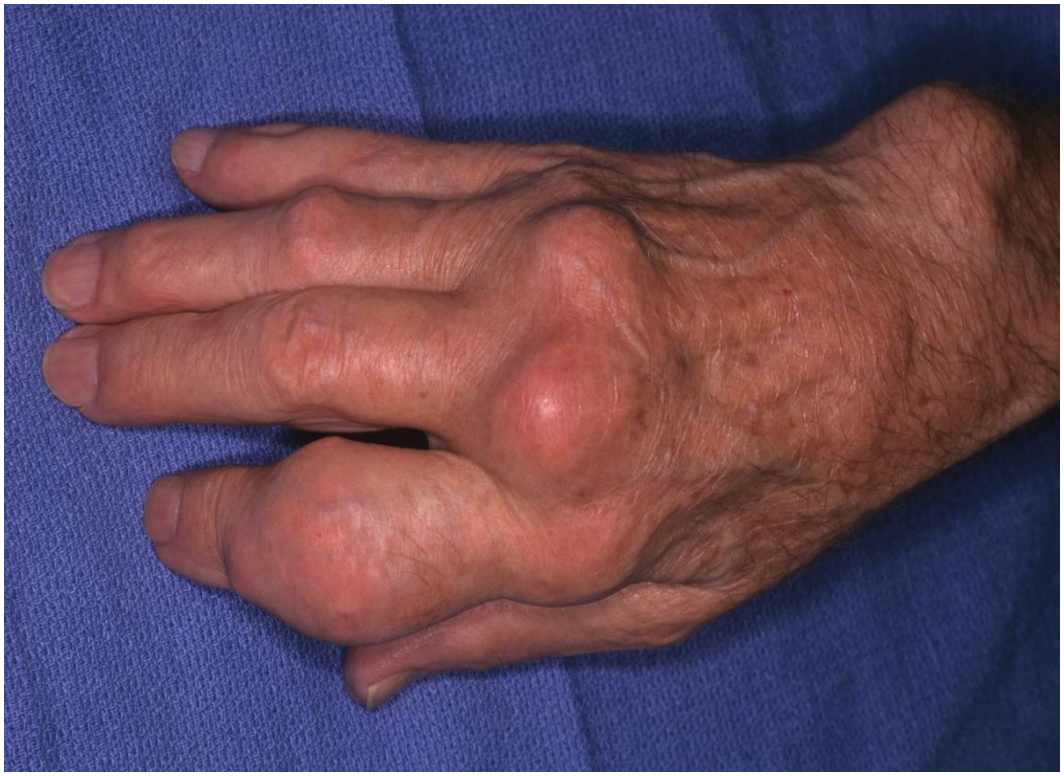
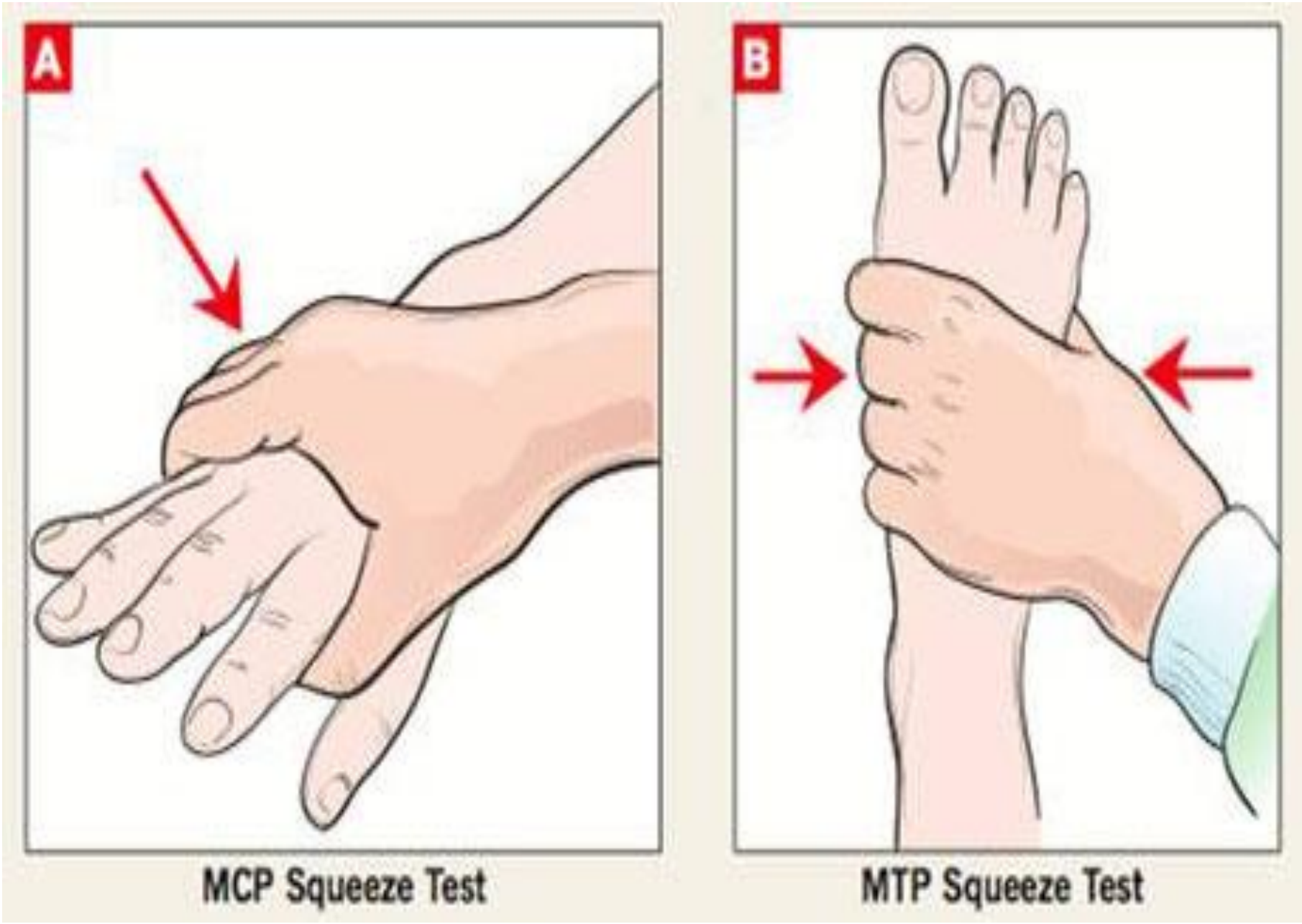


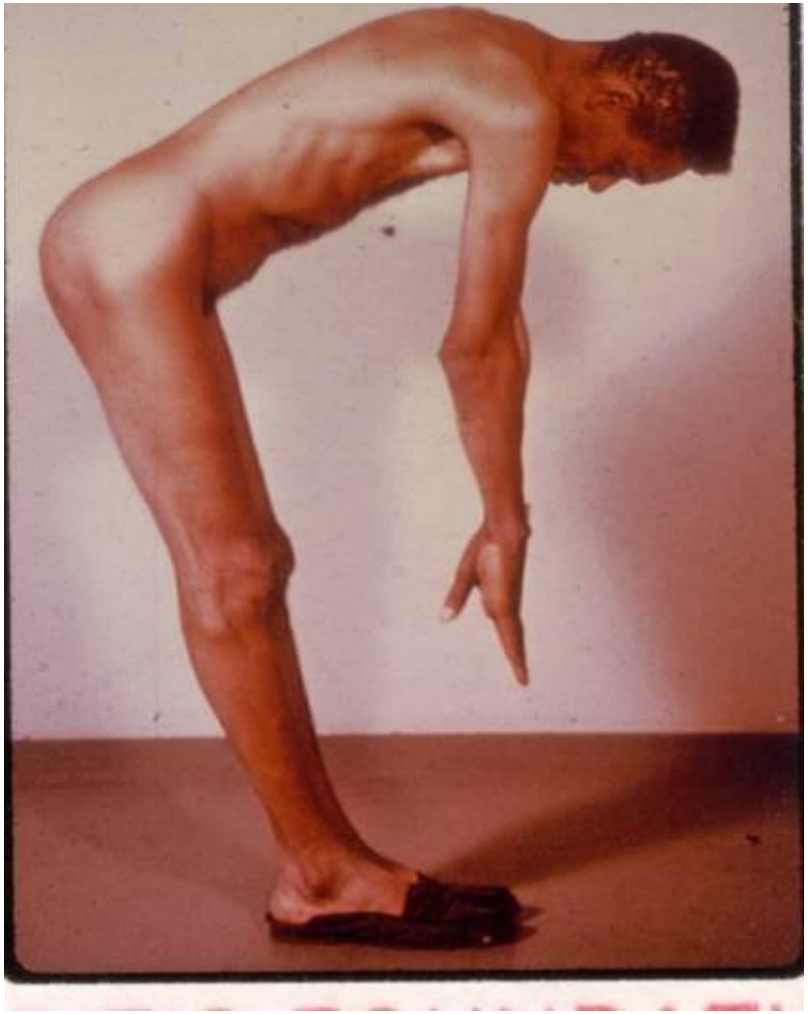


Examination of Musculoskeletal System

GALS


A
B
MCP Squeeze Test
MTP Squeeze Test

Schöber Test



"Must verify that the pain is truly monoarticular"

Ensworth S. Rheumatology: 1. Is it arthritis? CMAJ 2000; 1011--16

Investigations

Principles…

- Choice of investigations depends on history and examination
  - No set of tests is routine for all scenarios
- Cost-effectiveness
- May not require investigations
  - acute monoarthritis in an established case of gout or clinically obvious ankle sprain

Customizable, Not Routine Protocol

- Scenario 1– septic: CBC, SF study incl. CS, blood CS, CS of swab from interdigital infection
- Scenario 2– gout: CBC, S. uric acid, SF study
- Scenario 3 – PA: CBC, RF, ACPA, SF study (for exclusion of very unlikely crystal arthropathy)

Somewhat Routine…

- CBC
- Synovial fluid study: most valuable:
  - Naked eye inspection
  - Cell counts
  - Crystals: polarized light
  - Gram stain
  - CS

"Acute monoarthritis should be considered infectious until proven otherwise"

Goldenberg DL. Septic arthritis. Lancet 1998; 197--202

Sending Synovial Fluid…

- Collected as soon as possible
- One sample in a sterile container for ME & CS
- A second fresh sample for cytology
- Pediatric lithium heparin bottle ideal
  - Oxalate and EDTA may crystallize
- Delay may cause dissolution of crystals

Selective…

- Serum uric acid
- X-ray of the joint with contralateral
- Chest X-ray
- X-ray/ MRI SI joints
- Other imaging, e.g., USG, CT scan
- HLA B27, RF, ACPA, ANA
- Factors VIII, IX

Acute Monoarthritis: Mistakes I Hate to See Made

- Failing to perform or delaying joint aspiration
- Starting antibiotics before collecting SF for culture
- Starting treatment based only on lab data devoid of clinical insight, e.g., raised serum urate
- Aimless wandering in the sea of lab tests increasing cost & confusion

- *Lingling et al. CMAJ. 2009 59--65*

Conclusions

- Consider infection unless proved otherwise
- Redness indicates infection or crystal
- S. fluid study mandatory if infection suspected
- Acute monoarthritis is a medical emergency:
  - must be investigated and treated promptly
    - *Cibere J. Rheumatology: 4. Acute monoarthritis. CMAJ 2000; 1577—83*


Thank
you