Photo Quiz

Joint Pain and Swelling

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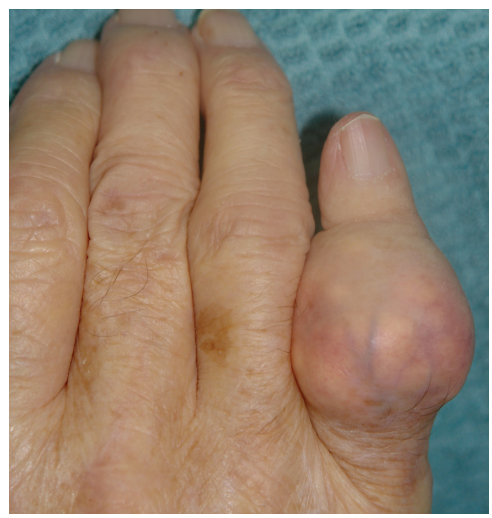

Figure 1.

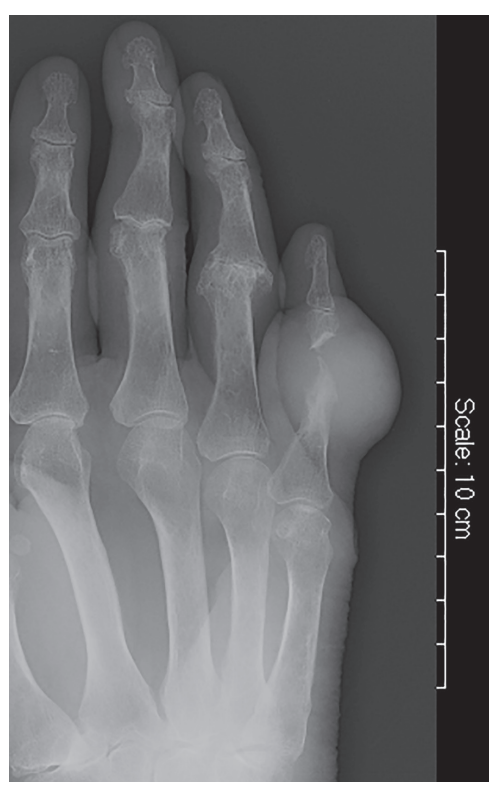

Figure 2.

An 89-year-old man had joint pain, swelling, and the inability to flex his fifth finger for several years. The swelling had appeared gradually after episodes of acute pain in that finger. He had chronic kidney disease (creatinine level of 5.3 mg per dL [468 µmol per L]) and poorly controlled diabetes mellitus (fasting glucose level of 172 mg per dL [9.5 mmol per L]).

On examination, there was swelling of the fifth proximal interphalangeal joint with yellow discoloration under the skin *(Figure 1)*. There was no erythema or warmth. A radiograph showed a 3-cm area of swelling at the center of the joint with advanced bony erosion *(Figure 2)*.

Question

Based on the patient's history and physical examination findings, which one of the following is the most likely diagnosis?

- ❑ A. Osteoarthritis.
- ❑ B. Psoriatic arthritis.
- ❑ C. Rheumatoid arthritis.
- ❑ D. Septic arthritis.
- ❑ E. Tophaceous gout.

See the following page for discussion.

Summary Table

Condition	*Clinical characteristics*	*Radiography findings*
Osteoarthritis	Stiffness, gelling, crepitus, and tenderness along the joint line; nodes of distal interphalangeal joints (Heberden nodes) and of proximal interphalangeal joints (Bouchard nodes); needle aspiration shows a noninflammatory cell count	Joint space narrowing and osteophytes
Psoriatic arthritis	Distal interphalangeal joint involvement; dactylitis with sausage digits; possible involvement of skin (scaly, erythematous plaques or guttate lesions) and nails (Beau lines, onycholysis, or pitting); positive for human leukocyte antigen-B27	Pencil-in-cup deformity
Rheumatoid arthritis	Persistent, symmetric polyarthritis (synovitis), typically involving the proximal small joints of the hands and feet; subcutaneous nodules; positive for rheumatoid factor and anti-cyclic citrullinated peptide antibodies; multisystem disease	Bony erosions, joint space narrowing
Septic arthritis	Pain, erythema, and joint swelling; any joint can be involved; needle aspiration demonstrates high leukocyte count and typically positive culture findings	Swelling without bony involvement
Tophaceous gout	Joint pain, swelling, and loss of range of motion; yellowish discoloration or discharge; hyperuricemia; needle aspiration demonstrates monosodium urate crystals in joint fluid	Erosions with sclerotic borders, calcified tophi, and complete destruction of the joint with reabsorption of the phalangeal bones

Discussion

The answer is E: tophaceous gout. Gout is a metabolic disorder in which uric acid, or urate, accumulates in the blood and tissues. Tophi are collections of urate crystals in the soft tissues that typically develop in patients with long-standing, poorly controlled, and/or untreated gouty arthritis. Tophi are classically located on the helix of the ear, but can occur in other locations (e.g., fingers, toes, prepatellar and olecranon bursae). Tophaceous gout leads to joint pain, swelling, and loss of range of motion. Patients who are older or who have renal insufficiency or diabetes are at increased risk of gout because of decreased excretion of uric acid.[1,2] A yellowish substance may be seen under the skin or may be expressed from the tophi. Needle aspiration demonstrates negatively birefringent needle-shaped crystals using polarized light microscopy; culture results are negative. Radiography may demonstrate bony erosions with sclerotic borders, calcified tophi, and complete destruction of the joint with reabsorption of the phalangeal bones.[3]

Osteoarthritis is a chronic, degenerative disease that can involve the distal and proximal joints of the hand, and can be mono- or polyarticular.[4] Manifestations include stiffness, gelling, crepitus, and tenderness along the joint line. Bony enlargement, Heberden nodes, and Bouchard nodes are smaller than tophi. Needle aspiration demonstrates a noninflammatory cell count. Radiography shows joint space narrowing, subchondral sclerosis, and osteophytes.

Psoriatic arthritis is a chronic inflammatory arthritis that develops in up to 5% of patients with psoriasis. It is characterized by distal interphalangeal joint involvement and dactylitis with sausage digits.[5] Most patients with psoriatic arthritis have concurrent involvement of the skin and nails, and have human leukocyte antigen-B27. Radiography shows a pencil-in-cup deformity.

Rheumatoid arthritis is a chronic systemic inflammatory disease with persistent, symmetric polyarthritis (synovitis).[6] The proximal small joints of the hands and feet are often affected. There may be extra-articular involvement of the skin, heart, lungs, and eyes. Although rheumatoid nodules are occasionally mistaken for tophi, patients with rheumatoid arthritis have rheumatoid factor and anti-cyclic citrullinated peptide antibodies, multisystem disease, and symmetric joint involvement, and they lack the yellowish discoloration or discharge. Radiography shows erosions and joint space narrowing.

Septic arthritis is an acute joint infection manifesting as pain, erythema, and joint swelling. It can affect any joint[7] and is usually caused by *Staphylococcus aureus* infection. Patients often have fevers and other systemic symptoms. Needle aspiration demonstrates a high leukocyte count and typically positive culture findings. Radiography shows swelling without bony involvement.

The opinions and assertions contained herein are the private views of the author and are not to be construed as official or as reflecting the views of the U.S. Navy Medical Department or the U.S. Navy.

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REFERENCES

1. Bolzetta F, et al. Tophaceous gout in the elderly. *Clin Rheumatol.* 2012;(7):1127-1132.
2. Dalbeth N, et al. Inflammation and tissue damage in crystal deposition diseases. *Curr Opin Rheumatol.* 2005;17(3):314-318.
3. Sky K, et al. Destructive tophaceous gout. *J Clin Rheumatol.* 2011;17(6):346.
4. Hart DJ, et al. Definition and epidemiology of osteoarthritis of the hand. *Osteoarthritis Cartilage.* 2000;8(suppl A):S2-S7.
5. Siannis F, et al. Clinical and radiological damage in psoriatic arthritis. *Ann Rheum Dis.* 2006;65(4):478-481.
6. Scott PL, et al. Rheumatoid arthritis. *Lancet.* 2010; 376(9746):1094-1108.
7. Ross JJ. Septic arthritis. *Infect Dis Clin North Am.* 2005;19(4):799-817. ■