

Osteoarthritis: Review Questions

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QUESTIONS

Choose the single best answer for each question.

- 1. A 43-year-old teacher presents for evaluation of diffuse joint pain. In addition to arthralgias, the patient describes numbness and tingling in his fingers that is worse at night. His medical history is notable for diabetes and hypertension. On examination his wrists, back, and knees are hyperextensible, and he has marked pronation of the ankles. The patient's wrists appear thickened without clear evidence of synovitis, and Phalen's maneuver is positive bilaterally. Radiographs of the hands are consistent with degenerative osteoarthritis, and distal digital tufting is noted. Which of the following is the most likely cause of this patient's osteoarthritis?**
 - A) Wilson's disease
 - B) Ehlers-Danlos syndrome, type III
 - C) Ochronosis
 - D) Primary generalized osteoarthritis
 - E) Acromegaly
- 2. Characteristic radiographic findings in osteoarthritis include all of the following EXCEPT:**
 - A) Osteophytes
 - B) Symmetrical joint space narrowing
 - C) Subchondral cysts
 - D) Subchondral bone sclerosis
 - E) Subluxation
- 3. A 65-year-old woman reports difficulty walking. She can walk for one block, but pain "in the back of her legs" forces her to stop and sit, which relieves the pain. She can walk for a long time in the grocery store, but the pain returns with carrying groceries into her house. On examination, she has limitation in range of motion in the cervical spine, marked Heberden's nodes and Bouchard's nodes, and knee crepitus. Her neurologic examination is unremarkable. Her distal pulses are detected with some effort. Which of the following is the most likely cause of her symptoms?**
 - A) Spinal stenosis
 - B) Vascular claudication
 - C) Knee osteoarthritis
 - D) Trochanteric bursitis
 - E) Lumbar radiculopathy
- 4. After playing 3 years of high-school football, a 17-year-old boy is offered a college scholarship at a Division 1 school. What is the likelihood that he will have significant osteoarthritis if he plays football for an additional 4 years?**
 - A) 36%
 - B) 15%
 - C) 100%
 - D) 75%
 - E) 50%
- 5. A 38-year-old male accountant complains of hand pain. A radiograph is notable for degenerative changes in the second and third metacarpophalangeal joints. Which of the following is the most helpful diagnostic test?**
 - A) Erythrocyte sedimentation rate (ESR)
 - B) Lyme titer
 - C) Ferritin level
 - D) Rheumatoid factor
 - E) Antinuclear antibody
- 6. A 30-year-old woman is morbidly obese. Which joints are most likely to have early degenerative changes?**
 - A) Hips and ankles
 - B) Knees and ankles
 - C) Hips and knees
 - D) Hands and knees
 - E) Lumbar spine and ankles

(turn page for answers)

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EXPLANATION OF ANSWERS

- 1. (E) Acromegaly.** Osteoarthritis in a relatively young person should always raise the suspicion of a secondary cause. Clues to a possible etiology are found in the medical history and in the distribution of joint involvement. Primary osteoarthritis is generalized in distribution but causes decreased range of motion. Ehlers-Danlos syndrome, type III (also known as benign hypermobility syndrome) causes hyperlaxity of the joints, but the laxity tends to decrease after adolescence, and digital tufting is not found on radiography. Wilson's disease and ochronosis are deposition diseases that result in the accumulation of copper and homogentisic acid, respectively, in cartilage. As a result, the compressibility of cartilage is compromised, which increases mechanical stress and accelerates degenerative changes. Patients with Wilson's disease may have mild hypermobility, but the distribution in the hand tends to be proximal, with marked osteophyte formation. In ochronosis, joint stiffness and decreased mobility are more prominent than joint pain. Acromegalic arthropathy results from the effects of growth hormone on bone and cartilage. Early in the disease, the cartilage hypertrophies and widened joint spaces appear on radiography. The cartilage is friable, however, and degenerates prematurely. Both diabetes mellitus and acromegaly are associated with carpal tunnel syndrome; however, the musculoskeletal findings and symptoms in this patient are most indicative of acromegaly.
- 2. (B) Symmetrical joint space narrowing.** Osteoarthritis can be thought of as a localized process in which mechanical forces are distributed in an unequal fashion over the joint surface, resulting in asymmetrical joint space narrowing. In contrast, the inflammatory arthropathies are mediated by the generation of soluble factors such as interleukin-6 and tumor necrosis factor α , which affect the cartilage in a global manner and result in symmetrical joint space narrowing. New bone formation is characteristic of osteoarthritis but is not unique to osteoarthritis, because new bone formation can also be seen in Paget's disease. Subchondral cysts appear in a variety of advanced joint diseases.
- 3. (A) Spinal stenosis.** The distribution of joint abnormalities in this patient suggests the diagnosis of primary osteoarthritis, which is a generalized process that involves the spine in a diffuse manner. Spinal stenosis most commonly results from degenerative changes of the facet joints and the vertebral discs, although a congenitally narrow spinal canal can be a factor as well.

The classic history of spinal stenosis is exacerbation with back extension, such as occurs with walking, and relief on flexion (hence the improved walking tolerance when leaning on a grocery cart). Pain is eased with sitting, as in vascular claudication, but the palpable pulses make the diagnosis of vascular claudication less likely.

- 4. (C) 100%.** Macrotrauma and repeated microtrauma are the most common causes of secondary osteoarthritis. Although being active and maintaining good muscle condition is probably protective for joints, sports and activities that involve excessive trauma to joints result in accelerated osteoarthritis. Ballet dancers, for example, are virtually unique in their occupational risk for ankle osteoarthritis. The sport that has the highest likelihood for development of premature osteoarthritis is football, with approximately 100% of players affected if they play for 7 years or more.
- 5. (C) Ferritin level.** Laboratory tests in patients with osteoarthritis are generally normal, including the ESR. No indication to obtain tests for inflammatory processes such as rheumatoid arthritis or systemic lupus erythematosus exists when degenerative changes alone are noted on radiography. The indications for laboratory tests in osteoarthritis are to exclude secondary causes of osteoarthritis, including metabolic diseases and the endocrinopathies. In this case, the factors that suggest a possible secondary cause of osteoarthritis are a relatively young age of the patient, who does not have an occupational risk for premature osteoarthritis, and the unusual distribution involving the metacarpals. Abnormalities of the second and third metacarpal joints are classic for hemochromatosis. Hemochromatosis causes joint symptoms in men at an earlier age than in women, who are protected from excessive iron deposition because of menses. The mechanism of damage of hemochromatosis is believed to be direct damage to chondrocytes from ionic iron.
- 6. (D) Hands and knees.** Although it seems intuitively clear that weight-bearing joints are affected by obesity, in reality, only the knees are significantly affected. Epidemiologic studies have shown that osteoarthritis of the hand is also increased in the context of obesity, a finding that has led researchers to hypothesize a circulating factor as a causative agent. Because increased body fat can result in increased conversion of precursor hormones to active estrogen compounds, an estrogen-like compound is a possible causative agent for osteoarthritis in obese patients.