

The characteristic radiographic features of osteoarthritis include joint space narrowing as a surrogate for cartilage loss; osteophytes and subchondral sclerosis as an indicator of new bone formation, which is characteristic of osteoarthritis; and subchondral cysts as a manifestation of myxoid or fibrous degeneration of subchondral bone. Bone attrition and subchondral bone remodeling may result in changes in bone shape. Magnetic resonance imaging (MRI) can demonstrate additional morphologic abnormalities, such as bone marrow lesions in subchondral bone, meniscal degeneration, and synovitis.

The pain and swelling of erosive hand osteoarthritis may suggest rheumatoid arthritis, although systemic inflammatory signs and other typical features of rheumatoid arthritis are absent. The prevalence of false-positive findings of rheumatoid factor and antinuclear antibody, sometimes in significant titers, is higher with increasing age. Osteoarthritis more commonly affects the distal small joints in the hands (DIPs > PIPs > MCPs and wrists), whereas rheumatoid arthritis more commonly affects proximal small joints in the hands (MCPs and wrists > PIPs > DIPs).

 For a deeper discussion of these topics, please see Chapter 258, "Imaging Studies in the Rheumatic Diseases," Chapter 264, "Rheumatoid Arthritis," and Chapter 265, "The Spondyloarthropathies," in Goldman-Cecil Medicine, 25th Edition.

TREATMENT

The natural history of osteoarthritis includes periods of relative stability interspersed with rapid deterioration. Management should be individually tailored and may include a combination of nonpharmacologic, pharmacologic, and surgical approaches. The primary goal of treatment is to improve pain and function and reduce disability.

Patients should be educated regarding the objectives of treatment and the importance of lifestyle changes, exercise, pacing of activities, and other measures to unload the damaged joints. The initial focus should be on self-help and patient-driven treatments rather than on passive therapies. Patients should be encouraged to adhere to nonpharmacologic and pharmacologic therapies. Physical therapists may be helpful in providing instruction in appropriate exercises to reduce pain and preserve functional capacity. For knee and hip osteoarthritis, assistive devices such as walking aids may be useful. Graded regular aerobic, muscle-strengthening, and range-of-motion exercises are beneficial. Tai chi may also be useful.

Overweight patients should be encouraged to lose weight. A knee brace can reduce pain, improve stability, and diminish the risk of falling for patients with knee osteoarthritis and mild or moderate varus or valgus instability. Advice concerning appropriate footwear is also important. Spinal orthoses may provide benefit to patients with significant cervical or lumbar involvement. Local applications of heat, ultrasound, or transcutaneous electrical nerve stimulation (TENS) may provide short-term benefit. Acupuncture may also offer symptomatic benefit for these patients.

Pharmacologic therapy provides symptomatic relief but does not alter the course of the disease. Pharmacologic therapy should therefore be selected based on its relative efficacy and safety. The

use of concomitant medications in the setting of comorbidities should be taken into account.

Acetaminophen (up to 3 g/day with caution) may be an effective initial oral analgesic for mild to moderate pain. In patients with symptomatic osteoarthritis, nonsteroidal anti-inflammatory drugs (NSAIDs) should be used at the lowest effective dose, although their long-term use should be avoided if possible. If patients are at risk for increased gastrointestinal toxicity, a cyclooxygenase-2 (COX2)-selective agent or a nonselective NSAID with co-prescription of a proton pump inhibitor or misoprostol for gastroprotection should be considered. All NSAIDs, including nonselective and COX2-selective agents, should be used with caution in patients with cardiovascular risk factors. Topical NSAIDs and capsaicin may be effective alternatives to oral analgesic or anti-inflammatory agents in knee and hand osteoarthritis and may be used as adjunctive agents, particularly in elderly patients.

Meta-analyses have shown that oral glucosamine and chondroitin sulfate have limited benefit in patients with knee osteoarthritis. If other interventions have been ineffective or are contraindicated, weak opioids and narcotic analgesics may be considered for the treatment of refractory pain. Stronger opioids should be used for the management of severe pain only in exceptional circumstances. Occasional injection of intra-articular corticosteroids (no more than once every 4 months) may provide modest short-term symptomatic benefit with minimal toxicity, especially in the knee. Patients with moderate to severe pain and effusion or other local signs of inflammation may be more responsive. Intra-articular hyaluronate appears to have little or no benefit based on current evidence.

Surgical management includes total joint replacement, which is extremely effective in relieving pain, decreasing disability, and improving function. With improvements in surgical technique and technology, the indications for total joint replacement have expanded to include younger and older age groups. Other surgical options include osteotomy and unicompartmental knee replacement. Arthroscopy is not recommended for the management of knee osteoarthritis.

PROGNOSIS

Given the obesity epidemic and the marked contact loads that increased weight places on the knee, obesity is likely the most important modifiable risk factor for the development and progression of knee osteoarthritis. One kilogram of weight loss decreases the load on the knee by 4 kg. Varus and valgus malalignments have also been identified as important risk factors for the progression of knee osteoarthritis.

 For a deeper discussion of these topics, please see Chapter 262, "Osteoarthritis," in Goldman-Cecil Medicine, 25th Edition.

SUGGESTED READINGS

- Blagojevic M, Jinks C, Jeffery A, et al: Risk factors for onset of osteoarthritis of the knee in older adults: a systematic review and meta-analysis, *Osteoarthritis Cartilage* 18:24–33, 2013.
- Helmick CG, Felson DT, Kwoh CK, et al: Estimates of the prevalence of arthritis and other rheumatic conditions in the United States. Part I, *Arthritis Rheum* 58:15–25, 2008.