

## OSTEOARTHRITIS OF THE KNEE JOINT

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**Abstract.** *Osteoarthritis of the knee joint (gonarthrosis) is a pathology that affects cartilage, subchondral bone, and soft tissues. Cartilage covers the articular surfaces of bones and acts as a shock absorber. Synovial fluid, as a natural lubricant, prevents the cartilaginous lining from wearing out.*

**Key words:** *Osteoarthritis, cartilage, knee joint, bone, synovial fluid, elder woman, osteophyte, varus, valgus, pain.*

## ОСТЕОАРТРОЗ КОЛЕННОГО СУСТАВА

**Аннотация.** *Остеоартроз коленного сустава (гонартроз) — патология, поражающая хрящ, субхондральную кость и мягкие ткани. Хрящ покрывает суставные поверхности костей и действует как амортизатор. Синовиальная жидкость, как естественная смазка, предотвращает износ хрящевой оболочки.*

**Ключевые слова:** *Остеоартроз, хрящ, коленный сустав, кость, синовиальная жидкость, пожилая женщина, остеофит, варус, вальгус, боль.*

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**Definition.** Osteoarthritis is a heterogeneous condition for which the prevalence, risk factors, clinical manifestations, and prognosis vary according to the joints affected. It most commonly affects knees, hips, hands, and spinal apophyseal joints. It is characterised by focal areas of damage to the cartilage surfaces of synovial joints, and is associated with remodelling of the underlying bone, and mild synovitis. It is variously defined by a number of clinical and/or radiological features. Clinical features include pain, bony tenderness, and crepitus. When severe, there is often characteristic joint space narrowing and osteophyte formation, with visible subchondral bone changes on radiography. The symptoms and signs of knee osteoarthritis include pain, stiffness, reduced joint motion, and muscle weakness. Long-term consequences can include reduced physical activity, deconditioning, impaired sleep, fatigue, depression, and disability.

Factors that have been associated with an increased risk of knee osteoarthritis include older age, female sex, overweight or obesity, knee injury, occupational factors (e.g., knee bending, heavy lifting, and squatting), and varus or valgus alignment.

Risk is not increased with recreational physical activity. Pain from osteoarthritis of the knee is difficult to study longitudinally because it fluctuates and its pattern evolves. Episodic pain is predictable in early stages but becomes less predictable and more distressing in late stages.

**Incidence/Prevalence.** Osteoarthritis is a common and important cause of pain and disability in older adults. Radiographical features are practically universal in at least some joints in people aged over 60 years, but significant clinical disease probably affects 15–25% of people.

Knee disease is about twice as prevalent as hip disease in people aged over 60 years (about 12% knee v 7% hip). In a general practice setting, 2% of people aged over 45 years have a currently-recorded clinical diagnosis of knee osteoarthritis; 7% will have had the clinical diagnosis made at some point. A community-based cohort study showed that radiological features of knee osteoarthritis were very common: 15% of women aged 45–60 years developed new knee osteophytes — an incidence of 5% per year.

**Evaluation.** A medical history and physical examination are typically sufficient to establish the diagnosis of osteoarthritis. One or both knees may be affected, with or without more generalized osteoarthritis (defined as the involvement of the hand and at least one large joint).

Symptoms begin gradually, usually in men in their 40s or older and in women in perimenopause or older. The pain is often dull, involving the whole knee or more localized, increases with joint use, and abates with rest. As disease advances, pain may occur at rest and at night, interfering with sleep. Morning stiffness lasts less than 30 minutes, and stiffness occurs briefly after daytime inactivity. Findings of knee osteoarthritis include crepitus, bony enlargement, reduced knee flexion, flexion contracture, and tenderness.

**Treatment.** In recent years, there has been a shift from primarily pharmacologic therapy to nonpharmacologic therapy, owing to the limited benefits of the former and evidence that nonpharmacologic approaches are more likely to relieve symptoms in the long term and to delay or prevent functional decline.

**Nonpharmacologic Therapy: Exercise and Diet**

Exercise is an essential component of the management of knee osteoarthritis.

A systematic review of randomized trials of land-based therapeutic exercise (vs. varied comparators) in people with knee osteoarthritis showed that exercise significantly reduced pain (with a moderate effect size based on high-quality evidence from 60 trials) and improved physical function (with a moderate effect size based on moderate-quality evidence from 60 trials) and

quality of life (with a small effect size based on high-quality evidence from 37 trials). Pain and function benefits were sustained at least 3 to 5 months after the end of formal treatment.

### **Other Nonpharmacologic Therapy Methods**

Owing to insufficient benefit and data quality, guidelines recommend against massage therapy, manual therapy (manual traction, mobilization or manipulation, or passive range of motion), and wedge insoles. Study results are inconsistent regarding the benefit of thermal interventions (locally applied heat or cold) and acupuncture.

### **Pharmacologic Therapy**

Some controlled trials showed a benefit of treatment with topical nonsteroidal antiinflammatory drugs (NSAIDs) similar to that with oral NSAIDs but with fewer adverse effects.

Their use should precede use of oral NSAIDs, although they are less practical when more than one joint is involved. The use of topical capsaicin is not recommended, given a paucity of high-quality data as well as small effect sizes.

If symptoms persist after the appropriate use of nonsurgical treatment, however, surgery can be recommended. There are different types of surgical procedures to treat knee oa at various stages and in consideration of patient related factors, such as age, level of physical activity and risk factors.

**Arthroscopic surgery** arthroscopy is widely used in the treatment of oa, despite the lack of evidence showing it to have greater benefit than other treatments. The different arthroscopic techniques include lavage, debridement, bone marrow stimulation of contained chondral lesions, osteochondral transplantation, and autologous chondrocyte transplantation. as autologous osteochondral and chondrocyte Transplantation are not indicated for knee oa, we will not discuss them in this review. most published studies of arthroscopic procedures for knee oa are of limited quality, owing to lack of randomization, lack of a control group, short-term follow-up, or inconsistent assessment methods. Only three randomized trials have compared arthroscopic surgery with a nonsurgical control procedure for knee oa.

**Lavage and debridement** the rationale for arthroscopic lavage is to wash out debris and inflammatory enzymes, consequently reducing symptoms of synovitis and pain and improving function.

Compared improvements in womaC score following tidal irrigation, performed with a 3.4 mm wrist arthroscope, and intra-articular corticosteroid injection. Both treatments provided short-term pain relief; however, the benefits lasted longer after irrigation.

After 5 months, only 24% of patients who received corticosteroids reported continued improvement, compared with 57% of those who underwent tidal irrigation. In both groups, the best outcomes were reported in patients with effusion and radiographic signs of mild oa at baseline.

### **Joint replacement**

Replacement of the entire knee joint, or total knee arthroplasty, is a safe and cost-effective treatment for severe oa of the knee. Durable alleviation of pain and improvement of physical function can be expected following the procedure. In addition to physician-derived data, patient-centered outcome measurements have also become an essential component of any long-term analysis of the success of total knee replacement. Owing to its irreversible nature, joint replacement is recommended only in patients for whom other treatment modalities have failed.

The procedure has a remarkably higher risk of failure 15 years after implantation in patients aged 50 years and younger 45 than in patients aged 70 years or older. Complications of joint replacement surgery include prosthetic loosening, wearing of the polyethylene insert, infection and periprosthetic fractures. For patients younger than 45 years, therefore, the risks and benefits of less-invasive surgical alternatives should be thoroughly weighed against those of total knee arthroplasty. Patients over 65 years of age are considered the best candidates for total knee replacement. Increasingly, older patients with severe oa, as well as younger patients, are successfully treated with total knee arthroplasty. Registers from all over the world, such as the Swedish

Knee arthroplasty register, 50 demonstrate a constant increase in joint replacement rates.

Joint replacement must be considered in patients with radiographic evidence of knee oa who have pain and disability refractory to conservative or joint-preserving therapy. The indication criteria for joint replacement surgery, however, might vary between countries.

### **REFERENCES**

1. Dillon CF, Rasch EK, Gu Q, Hirsch R. Prevalence of knee osteoarthritis in the United States: arthritis data from the Third National Health and Nutrition Examination Survey 1991-94. *J Rheumatol* 2006;33:2271-9.
2. Nguyen US, Zhang Y, Zhu Y, Niu J, Zhang B, Felson DT. Increasing prevalence of knee pain and symptomatic knee osteoarthritis: survey and cohort data. *Ann Intern Med* 2011;155:725-32.

3. Gill TM. Do the tenets of late-life disability apply to middle age? *Ann Intern Med* 2017;167:818-9.
4. Sharma L, Hochberg M, Nevitt M, et al. Knee tissue lesions and prediction of incident knee osteoarthritis over 7 years in a cohort of persons at higher risk. *Osteoarthritis Cartilage* 2017;25:1068-75.
5. Roemer FW, Kwok CK, Hannon MJ, et al. What comes first? Multitissue involvement leading to radiographic osteoarthritis: magnetic resonance imagingbased trajectory analysis over four years in the Osteoarthritis Initiative. *Arthritis Rheumatol* 2015;67:2085-96.
6. Felson DT, Niu J, Clancy M, Sack B, Aliabadi P, Zhang Y. Effect of recreational physical activities on the development of knee osteoarthritis in older adults of different weights: the Framingham Study. *Arthritis Rheum* 2007;57:6-12.
7. Merx, H., Dreinhofer, K. e. & Gunther, K. P. socioeconomic relevance of osteoarthritis in Germany [German]. *Z. Orthop. Unfall.* 145, 421–429 (2007).
8. Jackson, D. w., simon, T. M. & Aberman, H. M. symptomatic articular cartilage degeneration: the impact in the new millennium. *Clin. Orthop. Relat. Res.* 391 (Suppl.), s14–s25 (2001).
9. Buckwalter, J. A., saltzman, C. & Brown, T. The impact of osteoarthritis: implications for research. *Clin. Orthop. Relat. Res.* 427 (Suppl.), s6–s15 (2004). sturmer, T., Gunther, K. P. & Brenner, H. Obesity, overweight and patterns of osteoarthritis: the Ulm Osteoarthritis study. *J. Clin. Epidemiol.* 53, 307–313 (2000).
10. samson, D. J. et al. Treatment of primary and secondary osteoarthritis of the knee. *Evid. Rep. Technol. Assess. (Full Rep.)* 157, 1–157 (2007).
11. Jordan, K. M. et al. eULAR recommendations 2003: an evidence based approach to the management of knee osteoarthritis: report of a Task Force of the standing Committee for international Clinical studies including Therapeutic Trials (esCisiT). *Ann. Rheum. Dis.* 62, 1145–1155 (2003). siparsky, P., ryzewicz, M., Peterson, B. &
12. Bartz, r. Arthroscopic treatment of osteoarthritis of the knee: are there any evidence-based indications? *Clin. Orthop. Relat. Res.* 455, 107–112 (2007).
13. Arden, N. K. et al. A randomised controlled trial of tidal irrigation vs corticosteroid injection in knee osteoarthritis: the Kivis study. *Osteoarthritis Cartilage* 16, 733–739 (2008).
14. van Oosterhout, M., sont, J. K., Bajema, i. M., Breedveld, F. C. & van Laar, J. M. Comparison of efficacy of arthroscopic lavage plus administration of corticosteroids,

- arthroscopic lavage plus administration of placebo, and joint aspiration plus administration of corticosteroids in arthritis of the knee: A randomized controlled trial. *Arthritis Rheum.* 55, 964–970 (2006).
15. Laupattarakasem, w., Laopaiboon, M., Laupattarakasem, P. & sumananont, C. Arthroscopic debridement for knee osteoarthritis. *Cochrane Database of Systematic Reviews* 2008, issue 1. Art. No.: CD005118 doi:10.1002/14651858.CD005118.pub.2 (2008).
  16. Hubbard, M. J. Articular debridement versus washout for degeneration of the medial femoral condyle. A five-year study. *J. Bone Joint Surg. Br.* 78, 217–219 (1996).
  17. Chang, r. w. et al. A randomized, controlled trial of arthroscopic surgery versus closed-needle joint lavage for patients with osteoarthritis of the knee. *Arthritis Rheum.* 36, 289–296 (1993).
  18. Pridie, K. H. A method of resurfacing osteoarthritic knee joints. in: *Proceedings and reports of councils and associations: British Orthopaedic Association spring Meeting* 1959.
  19. *J. Bone Joint Surg. Br.* 41-B, 618–619 (1959). steadman, J. r., rodkey, w. G. & rodrigo, J. J.
  20. Microfracture: surgical technique and rehabilitation to treat chondral defects. *Clin. Orthop. Relat. Res.* 391 (Suppl.), s362–s369 (2001).
  21. Johnson, L. L. Arthroscopic abrasion arthroplasty historical and pathologic perspective: present status. *Arthroscopy* 2 54–69 (1986).