



# ORTHOPAEDIC SPECIALTY INSTITUTE

MEDICAL GROUP OF ORANGE COUNTY

## **OSTEOARTHRITIS OF THE KNEE**

**Definition and description:** Osteoarthritis is the degeneration or loss of the cartilage cushion that lines the inside of joints, covering the ends of the bones that make up the joint (articular cartilage). This condition is also called OA, degenerative arthritis, traumatic arthritis, degenerative joint disease and osteoarthrosis.

**Symptom:** The loss of cartilage causes the surfaces to become irregular, which ultimately can cause mechanical symptoms of grinding, catching and popping. Other symptoms frequently associated with osteoarthritis are pain, stiffness, loss of motion, swelling due to irritation of the joint lining or accumulation of joint fluid (effusion), weakness and atrophy of the leg muscles, and laxity of the ligaments.

**Causes:** Osteoarthritis may be related to previous trauma, age, obesity, anatomic alignment and metabolic or hereditary factors. The prevalence of arthritis increases with age. In many cases there are multiple contributory factors including lifestyle decisions. Numerous studies show the early onset of osteoarthritis 15-20 years after meniscus injury/surgery and 14 years after ACL injury/surgery.

**Treatment Options:** In general I use an incremental, stepwise approach to the management of knee osteoarthritis which is based on available research and tailored to the individual patient. My goal is to improve knee pain and quality of life, while educating patients with regard to conservative treatments so they can delay surgical intervention and are less dependent upon health care providers. Knee osteoarthritis is a long term condition which changes overtime and the process of education and communication is essential for success. As the patient's condition evolves over time there may be changes in treatment recommendations as they become more suitable.

### **1. Non-invasive**

• **Over the counter medication** such as Tylenol is a reasonable medication with which to start treatment. If this is not successful, then over the counter non-steroidal anti-inflammatories (NSAIDs) such as Ibuprofen (Advil, Motrin) or Naproxen (Aleve) are usually utilized. When taking these medications, patients must be careful regarding side effects such as stomach upset or bleeding, and they should not be taken on an empty stomach. Patients should be tested regularly for kidney and liver function if taking high doses for prolonged periods. If you have high blood pressure or heart disease, please check with your internist or cardiologist first.

• **Supplements** are difficult to recommend since many treatments and studies are unregulated. Turmeric and Glucosamine/Chondroitin may be beneficial. Turmeric is a spice used in cooking but also comes in pill form. Curcumin is a key chemical in turmeric and claims to reduce pain, inflammation and stiffness related to osteoarthritis and rheumatoid arthritis. This therefore reduces the amount of NSAID's and pain medications needed to manage the arthritis. We recommend Doctor's Best Curcumin Phytosome 500mg tabs twice a day. Glucosamine and Chondroitin Sulfate may protect joint cartilage and delay arthritis progression. It is said to work by increasing proteoglycan production and decreasing degradative enzymes. Studies show modest improvement (10%) and it works slowly (takes up to 3 months). Omega-3 supplements have also been shown to provide benefit.

- **Prescription anti-inflammatories (NSAID's)** such as Mobic, Voltaren, and Tramadol may be effective if over the counter medications are not tolerated or have not been effective.

- **Application of ice** to the joint is frequently helpful in controlling pain and swelling, especially after activities. Frozen popcorn kernels or peas can be utilized as they can be molded to the joint. Ice should not be applied directly to the skin as it can cause "ice burns". We suggest that you cover the skin with a moistened washcloth or towel before placing the ice pack.

- **Topical medications** – In some cases the application of ointment or cream to the skin overlying the knee joint may be helpful. Creams and ointments containing capsaicin (such as Zostrix), which comes from the seeds of red peppers, are available over the counter. In some cases we will prescribe Voltaren or Pennsaid cream which is the topical form of an anti-inflammatory medication usually taken by mouth.

- **Lifestyle changes** that can be helpful include weight loss, activity modification, and dietary modifications such as a modified Mediterranean diet, high fiber diets, limited gluten intake, and increasing sleep to 8 hours per night. Also refer to the link on Lifestyle and Dietary Guidelines for Patients with Chronic Inflammatory Conditions for more specific recommendations.

- **Physical therapy** can help control swelling, increase joint range of motion and increase strength of the quadriceps, hamstrings, glutes (hip rotators) and core. Strengthening and restoring motion can help "unload" the stresses on the knee joint. Regaining full extension (straightening) has been shown to decrease pain in the arthritic knee, and frequently allows the patient to avoid surgery.

- **Bracing** is frequently effective in controlling symptoms of osteoarthritis. At times an elastic or neoprene (wetsuit material) sleeve can be effective in controlling swelling and pain. In some cases a neoprene sleeve with hinges can provide better symptom relief by providing more support. In cases where the arthritis affects only one side of the joint (inner or outer, i.e. medial or lateral), a custom fitted unloading brace can be very effective in relieving symptoms with weight bearing activities such as walking or hiking cause pain. This works by transferring the load to the opposite side of the joint. This brace is most effective when worn directly on the skin or over a thin sleeve and should not be worn over clothing. Although the brace is lightweight, sometimes patients find it uncomfortable in warm weather or difficult to wear if they are of short stature. Increased leg girth can make it difficult to get a proper fit.

## 2. **Injection therapy**

- **Cortisone** (steroids) can be very helpful for the relief of acute pain. The medication is biologically effective for 1-14 days; however, the positive effects of the injection can last much longer due to reductions in inflammatory markers. It is important that cortisone not be overused. The type and dose of cortisone used can determine the response to injections, both positive and negative.

- **Viscosupplementation** is the injection of artificial joint lubricant. These are purified forms of hyaluronic acid which is a component of synovial fluid. It acts as a shock absorber and lubricant. The theory behind viscosupplementation is that patients with arthritis produce joint fluid that is thinner than necessary to provide adequate lubrication, leading to the stimulation of proinflammatory pathways. Hyaluronic acid decreases the inflammatory response, improves viscoelastic properties and protects cartilage degeneration and provides thicker fluid which lubricates better. 32 published clinical trials show hyaluronic acid is superior to placebo in relieving symptoms associated with arthritis. These injections produced similar results as NSAID's and corticosteroids but tend to last 6 months or longer. There are a number of products used for

this purpose including Euflexxa, Synvisc, Orthovisc, and Hyalgan. This treatment involves either a single injection or a series of 3 injections into the knee one week apart. Occasionally cortisone is given with the first injection. Patients occasionally report relief after the first or second injection, but most people report lessening of symptoms after the third injection, thus it is best to have all 3 injections for maximum benefit. We usually ask patients to return for reevaluation 6 weeks after the third injection so we can determine the result of the injections. We also use a newer product, Monovisc, which is a single injection instead of the 3 and the results have been comparable. Some insurance companies will not authorize the single dose injection. Clinical studies have shown improvement in symptoms of up to 6 months (or more in some cases). Most insurance carriers, including Medicare, will approve repeat injections after 6 months; however, it is important for us to document the improvement following the series. Recently Blue Cross has decided it will not pay for these injections at all.

### 3. Orthobiologics

- Biological substances such as PRP and stem cells are used in the treatment of musculoskeletal injuries. They may be used alone or in combination with conventional pharmaceutical and non-pharmaceutical based treatment. Orthobiologics introduce high concentrations of naturally occurring cellular concentrations to an injury site with the intention of expediting the healing of muscles, ligaments, tendons, bones, and other tissues; thereby shortening recovery time and decreasing injury-related inflammation and pain.

- **Platelet rich plasma (PRP)** is the injection of the patient's own blood back into the joint after it is processed in a special way. The theory behind this treatment is that the platelets contain several important growth factors and over 1500 proteins that may help the joint "heal" by stimulating the cartilage and soft tissues and inhibit the inflammatory response. Growth factors in PRP have a positive effect on cartilage metabolism and regenerative synovium, meniscus and chondrocytes. This stimulates proliferation of chondrocytes, the cells found in cartilage. The process is done in office and involves drawing blood from an arm vein, spinning it down in a centrifuge to separate the platelets from the cells and the serum, and then injecting the platelets into the joint. These injections are not covered by insurance.

- **Stem Cells** can be harvested from the patient's bone marrow, adipose tissue (fat) or from amniotic fluid. Results in the medical literature are conflicting. The treatment is quite expensive and not covered by insurance. Recent studies with bone marrow aspirate (BMAC) have demonstrated beneficial results in osteoarthritis.

- **Regenokine treatment** has been reported in the media as a treatment that has been pursued by a number of professional athletes. With this treatment the patient's blood is taken from an arm vein and a serum is made, and then injected in a series of 6 injections within a 6-week period. Although this technique has been very successful in Europe and more recently in the U.S., it is not covered by insurance and the cost is \$9000 for a single joint and \$12,000 for two joints when done in Los Angeles. At the present time there are no facilities in Orange County that can provide this treatment; however, information for the facility in L.A. can be provided upon request.

### 4. Surgical intervention

- **Arthroscopy** is a minimally invasive outpatient procedure that is done to "clean up" the joint. MRI will usually demonstrate a torn meniscus (or menisci) in addition to wear of the joint surfaces. It is often difficult to determine whether the symptoms are coming from the torn meniscus or from the arthritic changes involving the joint surfaces; however, when there are mechanical symptoms of catching, popping or locking which localize to the part of the knee

where the meniscus is torn, the results of surgery are more predictable. The recovery is usually 8-12 weeks depending on the degree of arthritis. It is possible that the surgery may not be beneficial if it is determined that the symptoms were primarily arthritic in nature. In rare cases the surgery may worsen the symptoms.

• **Joint replacement** (arthroplasty) surgery is performed when the amount of joint wear is excessive and the patient's symptoms prevent him/her from performing activities of daily living without significant pain, or they cannot pursue reasonable desired activities without significant pain. Replacement can be partial (unicondylar replacement) or complete (total joint replacement). Our joint replacement specialists, Dr. Gorab, Dr. Barnett and Dr. Patel, perform these procedures. Unfortunately, joint replacement does not provide relief for all patients and it is important to optimize the patient's overall condition prior to surgery.