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Meniscus Tears
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Overview

Injuries to the menisci are one of the most common knee injuries. They can occur in isolation or with associated injuries to knee ligaments, and often occur with cutting, pivoting, or landing awkwardly from a jump. Symptoms can include pain, swelling, locking of the knee, and loss of motion. A thorough physical exam, patient history, and the use of magnetic resonance imaging (MRI) are the primary means of diagnosing meniscal injuries. Arthroscopic treatment involving removing or repairing the meniscal tear is the primary method of treatment.

Anatomy

There are two menisci in each knee; each shaped like a “C”, with one on the inside of the knee (medial meniscus) and one on the outside of the knee (lateral meniscus). They sit on top of the tibia (shin) plateau bone and are attached to the bone at the front and back of the “C”. In addition, they are variably attached to the soft tissue at the periphery (figure 1). The lateral meniscus is less firmly anchored in the knee, thereby giving it more mobility which contributes to an increased risk of tearing. The menisci are made of collagen, which cross each other at right angles within the menisci, creating strong bonds.

At birth, the entire meniscus is supplied with blood. By nine months of age, however, the inner one-third of the meniscus has become avascular (without a blood supply). It receives its nutrition by absorbing nutrients contained within the joint fluid. By age 10, the inner two-thirds of the meniscus has become avascular, and remains that way throughout life.

Meniscus Function

The menisci occupy a position between the thigh (femur) and shin (tibia) bones. In that position, they are ideally located to act as shock absorbers for forces being transmitted across the knee. Because the femur bone is rounded at the end while the tibia bone is flat, this would normally lead to a concentration of stress at the point where these two bones connect. With its wedge shape, the menisci function to decrease and distribute this stress across a larger contact area, which also increases the stability of the joint. The menisci transmit between 50-90% of the forces across the knee. Thus, loss of meniscal tissue causes significant increases in the stress placed on the end of the bones. Load across the knee with part or all of the meniscus removed decreases the contact area and increases the contact stress at the knee joint.



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Such changes from the loss of the meniscus can lead to detrimental changes in the knee joint. The ends of the bones are subjected to higher forces, which leads to a breakdown of the cartilage which coats the end of the bones. This cartilage normally allows frictionless movement of the bones across each other. With breakdown and subsequent loss of the cartilage, the knee will begin to show signs of arthritis (narrowing of the joint space on x-rays, bone spur formation).

Meniscus Tears

The menisci can be injured during any activity. In younger patients, they typically occur with cutting or pivoting sports, often in association with an injury to the anterior cruciate ligament (ACL). Meniscal tears can also be degenerative in nature, and these typically occur in patients typically 40 year or older. Degenerative tears occur when the meniscus develops smaller tears over time that do not heal. At some point, the cumulative damage to the meniscus reaches a point where it becomes painful to the patient. Oftentimes, patients do not remember one specific event that caused their pain to occur, or the event may have been very minor such as arising from a chair. This is in contrast to meniscal tears in younger patients, which are typically traumatic in origin.

Symptoms and Diagnosis

Younger patients typically report a traumatic or sport-related injury. Afterwards, they were unable to continue playing and may have difficulty putting weight on their leg. They may also complain of pain on the inner or outer parts of the knee with catching, locking, or limited movement. Older patients may also complain of catching or locking, as well as pain with extended walking or standing. On examination by a health care provider, swelling within the knee may be noted as well as pain with squatting, and tenderness at the level of the joint to direct palpation.

Plain X-rays are usually obtained, which may give information on any arthritis (narrowing of the joint space) or associated fractures. However, x-rays do not show soft tissue structures such as the meniscus. Because of this, a magnetic resonance imaging (MRI) is often obtained. An MRI is a special radiographic test that specifically looks at the soft tissues; in this case, the ligaments, cartilage (that coats the end of the bones), and the menisci. An MRI is often ordered to confirm the diagnosis of a meniscal injury as well as give information on the size and severity of the tear.

Treatment

Secondary to their limited blood supply, meniscal tears typically do not heal and require operative treatment to relieve the pain and limited motion. Due to their important role in helping to reduce the forces across the bones of the knee joint as well as cushion the bones, the presence of a meniscal tear can have some long-lasting effects. When a meniscus is torn, it does not effectively function as a cushion to the knee joint. Whether



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or not a torn meniscus is removed and left in place, patients can develop signs of arthritis in the knee in the area of the meniscal tear. This typically takes years to decades to become evident.

In an attempt to avoid this problem, orthopaedic surgeons sometimes will attempt to repair a meniscal tear in an effort to get the tear to heal and regain its cushioning effect on the joint. This typically involves an arthroscopic surgery where the surgeon places thin sutures across the tear in an effort to get the tear to heal itself. Because of the limited blood supply to the meniscus, some repaired tears still will not heal and will remain symptomatic. As stated earlier, the meniscus loses its blood supply as people age; therefore, meniscus repairs are usually only attempted in younger patients (under 40 years old). In older patients, the tear is typically carefully removed during an arthroscopic surgery. It is important to only remove the damaged or torn meniscus, and leave all healthy meniscus so as to keep as much cushion in the joint as possible.

Rehabilitation

With a meniscal repair, patients are typically kept off their knee with crutches for 4-6 weeks to allow the meniscus to start healing. Typically by 3-4 months after surgery, patients are gradually introduced back into their full activities. In patients who have their meniscus tear removed (called a menisectomy), it is usually recommended that patients limit their standing and walking the first 2-4 weeks, and usually are back to full activities by 4-6 weeks.

Dr. Honkamp specializes in sports medicine, shoulder and knee injuries as well as joint replacements. To reach Dr. Honkamp or to schedule an appointment please call 224-5205.



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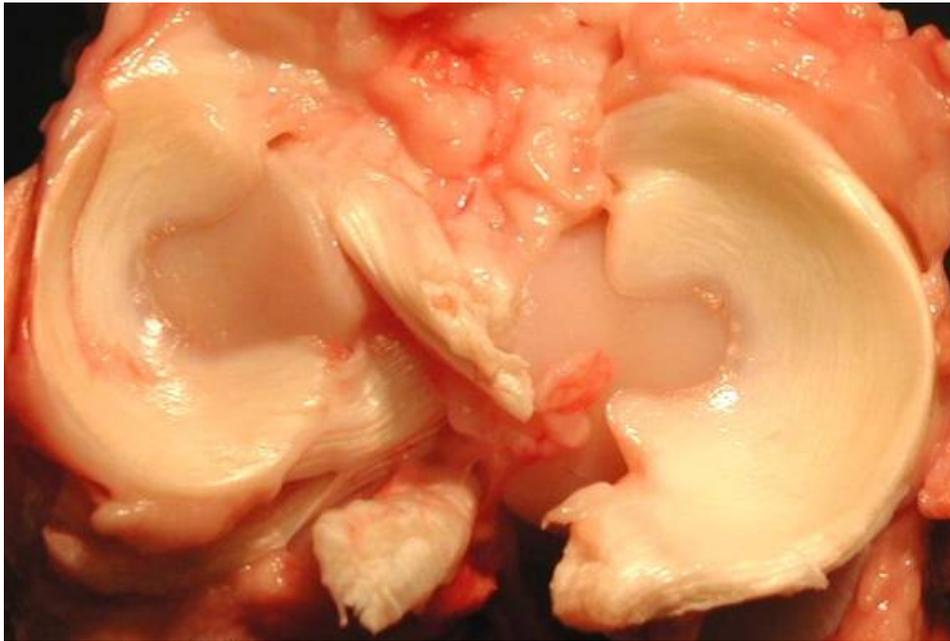


Figure 1: Menisci of the Knee