

Cartilage Injuries in the Knee of an Athlete

What is a cartilage injury?

Cartilage injuries are common in athletes and can be seen in sports that require a lot of twisting and pivoting around the knee joint such as football and basketball. There are two types of cartilage within the knee joint: articular cartilage and meniscus.

Articular cartilage coats the surface of the three bones that make up the knee joint: the femur, the tibia, and the patella (kneecap). The main purpose of articular cartilage is to provide a smooth surface for the bones to glide against one another and to act as a shock absorber. Injury to the articular cartilage can occur when there is a force applied to the cartilage that exceeds its capacity. It can also be damaged from wear and tear over the years. Articular cartilage does not have a blood supply and must rely on the fluid in the knee joint called synovial fluid for its nutrients. Because of this the articular cartilage has very little capacity to repair itself when injured. When articular cartilage is damaged, the patient develops arthritis.

The meniscus is the other type of cartilage within the knee joint and there is one on the inside (medial meniscus) and outside (lateral meniscus) of the knee. The common expression "torn cartilage" refers to a tear of the meniscus, not the articular cartilage. The meniscus is in a crescent shape that is attached to the outer portion of the tibial surface and conforms to the rounded portion of the end of the femur where articular cartilage resides. The meniscus has many functions but is primarily thought to distribute or spread the forces (standing, walking, running etc...) between the femur and tibia much like an O-ring. Injury can occur when a person twists or rotates the upper leg while the foot remains planted on the ground. The very outer portion of the meniscus has a blood supply and has the capacity to heal when torn. The central one-third of the meniscus has a variable healing capacity and the most inner portion of the meniscus is frequently not repairable.

What symptoms are present with an acutely torn cartilage?

In younger patients, a specific injury usually occurs. In older patients, the meniscus can often tear with a simple twisting motion. There is usually sharp pain in the knee with either straightening or deep bending of the knee depending on the location of the tear. There can be some swelling of the knee that usually occurs over a 24 hour period but can occur rapidly within 1-2 hours. There can be a description of catching, popping, or even locking where the knee is unable to fully straighten. If a piece of the torn articular cartilage or meniscus is wedged between the femur and tibia, the knee can be very painful and have limited motion such as locking because of the mechanical block. Symptoms of the cartilage tear frequently persist and require surgical treatment.

How can a cartilage tear be diagnosed?

In addition to the described symptoms, a physical exam and x-rays can be used to help with the diagnosis. Physicians may use a test in which the doctor flexes (bends) the leg then rotates the leg outward or inward while extending it. This can elicit or reproduce the pain in the knee joint and is suggestive of a meniscal tear. Articular cartilage tears may present as joint line pain but in general are much more difficult to diagnose based on the physical exam. An MRI, which uses powerful magnets to cause the tissue to produce signals and is detected by a computer, can be used to confirm or identify the cartilage injury. Finally, arthroscopy, which is placing a small camera (5 millimeters in diameter) in the knee joint and displaying the images on a television screen, can be used to identify meniscal tears and articular cartilage lesions.

What is the treatment for a cartilage injury?

In some cases, the symptoms from the tear may be mild and a muscle strengthening program is frequently recommended that may include:

- Straight leg raises
- Stationary bicycle riding
- Leg extension with small weights
- Exercises in pool

In most cases, the tear caused mechanical symptoms such as locking, swelling, popping or catching. In such cases, there is a greater risk of the torn meniscus causing damage to the articular surface with arthritis resulting. When these symptoms occur, the knee usually requires arthroscopic surgery to either repair or remove the torn cartilage.