

## **Meniscal Injuries**

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Meniscal injuries represent one of the most common problems seen by the orthopaedic surgeon evaluating knee conditions and is the most common knee problem treated surgically. While its presentation varies in different age groups, it is a problem seen throughout adulthood, both in athletes and non athletes alike. Technology advances have improved our ability to diagnose and treat various meniscal problems, and have succeeded in restoring knee function to many individuals who would have otherwise suffered irreversible and permanent injuries.

First in the discussion of meniscal injuries is to understand normal meniscal anatomy and function. The knee is a hinged joint that flexes, extends, and rotates slightly. The upper half of the joint has a curved surface whereas the lower half is flat resulting in some degree of mismatch between the two. The meniscus is a semicircular disc of cartilage that is attached to the tibia and joint capsule. Its central portion thins down to an edge resulting in improved conformity between the curved and flat surfaces of the joint. There is a single meniscus in the inner and outer compartments of the knee. The functions of the meniscus are multiple and include improved conformity of joint surfaces, shock absorption to impact loads across the joint, stability to abnormal movements of the knee, maintaining healthy cartilage through joint fluid lubrication, and sensory feed back to joint motion. The blood supply is an important and unique consideration as only the outer third of the meniscus has blood vessels within it whereas the inner two thirds does not. Thus, the ability for meniscal tears to heal is limited in tears involving the inner two thirds compared to outer third tears. Age related degenerative changes to the meniscus make it more susceptible to tears.

Meniscal tears can be acute, chronic, or a combination of the two. Acute tears tend to happen in younger individuals as a result of a forced twisting and loading injury to the knee and may be associated with other ligamentous, cartilage, or bone injuries. These tears may occur in the vascularized portion of the meniscus and heal or can be successfully repaired. Chronic tears tend to involve the central portion of the meniscus, frequently result in a more complex tear pattern and rarely heal. Acute tears tend to occur more often in younger individuals during sporting or athletic events, whereas chronic tears may develop insidiously and occur more frequently in adults over forty.

Diagnosing a meniscal tear starts with a history of how the injury occurred and a thorough knee exam. Contact sports and those that involve twisting and jumping raise the suspicion of a tear, although, a specific injury may, in chronic cases be absent. Symptoms commonly will

consist of sudden onset of knee pain, swelling, and catching type symptoms both with knee movement and twisting of the knee. Occasionally the knee may be locked in a position where it cannot be straightened or flexed due to interference of the torn meniscus.

Chronic tears may only present with localized pain, with or without swelling, or mechanical symptoms. Physical exam is most notable for swelling, isolated tenderness over the joint line, and pain with twisting movements of the knee. Associated injuries including those to the cruciate or collateral ligaments should also be assessed.

X-rays are important for eliminating other conditions such as arthritis or developmental knee problems involving the cartilage or bone. An arthrogram is an x-ray with injection of dye into the joint and was previously used to diagnose meniscal tears. Magnetic resonance imaging (MRI) has replaced arthrograms and, in some complicated cases, can be enhanced by injecting dye into the knee joint. An MRI scan is not absolutely necessary to make the diagnosis of a meniscus tear as this may be clinically obvious. MRI scans can further be confusing as they may show degenerative changes within the meniscus which can be misidentified or confused for a tear. Knee arthroscopy is considered, by most, to be the absolute standard for evaluating the meniscus if suspicion of a tear is high.

Treatments of meniscal injuries have evolved with time. Prior to the advent of arthroscopy, most symptomatic tears were approached through a surgical incision and removal of the entire meniscus. In part, as a result of this treatment, many individuals developed premature arthritis. This procedure is abandoned now except in extreme circumstances. Surgical treatment is not appropriate for all meniscal tears as some may either be insignificant or able to heal without intervention. These include stable tears in the vascularized portion of the outer meniscus or small tears isolated to the inner meniscus. Conservative treatment includes a period of rest to allow pain and swelling to resolve, use of anti-inflammatory medications, and physical therapy directed at restoring strength, mobility, and function. Progressive return to preinjury activities is advised and can be successful.

Surgical treatment for meniscus injuries is appropriate for tears believed to be unstable as well as for those which have failed to improve with conservative treatment. Arthroscopic surgery allows the orthopaedic surgeon to both evaluate the meniscus and perform treatment. Surgical treatment depends on the type of tear present and its location. Chronic or degenerative tears are treated with partial meniscectomy, or removal of the torn tissue while retaining the remainder of uninvolved meniscus. Acute tears occurring in the nonvascularized portion of the inner meniscus are also an indication for partial resection. Meniscal repair techniques consist of various means to reattach the torn meniscus and stimulate it to heal and are appropriate for tears in the vascularized portion of the meniscus. It is also important to address other

conditions such as torn ligaments and alignment problems that may adversely affect meniscal healing. The recovery following surgery to the meniscus varies depending upon the procedure performed but, in general, attempts are made to restore knee motion, strength, and function as early as possible.

In general, results of meniscal treatments are very successful. Following partial meniscectomy, most individuals can resume their preinjury activities. Even in those that continue to experience some difficulty, long term results following partial meniscectomy and meniscal repair have not shown the degree of deterioration of the joint that was previously noted following removal of the entire meniscus. While osteoarthritis frequently accompanies degenerative tears of the meniscus, it may not be as symptomatic as the meniscus tear itself and appropriate treatment allows some individuals the ability to resume their previous lifestyle.

Individuals who have knee symptoms not fully explained either by arthritis or other known injuries should seek evaluation with regard to the potential for meniscal injuries. Almost all orthopaedic surgeons who see and treat knee disorders are well versed in the various techniques described here both for diagnosis and treatment and can assist these individuals in their treatment and recovery.