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## DISORDERS OF THE KNEE MENISCI

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The menisci are triangular C-shaped structures within the knee joint which are wedge-shaped in cross section. These are composed of fibrous collagen bundles of cartilage. The peripheral 30% of the diameter of the meniscus is the only portion of the meniscus with a blood supply with the remaining two-thirds avascular. The blood supply of the meniscus is important to understand as we discuss injuries to the menisci and whether or not these injuries can heal. There is a meniscus on the medial and one on the lateral side of the knee. These menisci are different in shape. The lateral meniscus is more mobile and consequently has a decreased incidence of injury.

The functions of the menisci are accepted generally as being nutrition, weight bearing, stability, and motion. The nutritional function aids in spreading a thin film of synovial fluid over the articular cartilage and circulating the fluid throughout the joint. 30% of the weight of the joint is carried by the menisci with the menisci forming a major portion of the weight bearing surface of the joint. The menisci also help guide the femur in its tracking motion of the knee.

Meniscal tears are classified according to their location, age, and orientation. The usual history is a twisting injury to the knee when the foot is fixed and the knee is flexed producing compression and rotation on a meniscus trapped in the joint. With a *complete tear*, the entire central segment is displaced into the joint during the injury. This complete, or *bucket handle tear* may produce locking of the knee joint. Locking occurs when a meniscus or segment of a meniscus becomes interposed between the femur and the tibia. The most common type of tear is a *posterior flap tear* where a small piece of meniscus posteriorly will be torn with rotation and will flap back and forth according to the movement of the knee. This type of tear can be relatively asymptomatic for long periods of time only giving problems with certain twisting-type movements. A third type of tear is the *horizontal tear* where rotation produces shear forces

between the top and bottom of the menisci causing this to split in two.

Tears can also be classified into *acute* and *chronic*. An *acute tear* is due to a specific injury. This type of tear does not necessarily produce severe pain or swelling due to the avascular nature of the menisci. This usually occurs with a twisting type injury and although it does produce pain, one can usually continue to participate in the activity that caused this. Often, the next day the knee becomes stiff and sore and sometimes swells. The degree of problems depends upon how mobile this fragment becomes. If the fragment is large and displaces into the joint, the knee can lock meaning one cannot extend the knee fully.

In a knee with a torn meniscus, pain can be a variable finding. One is often tender over the joint line where the meniscus is torn and typically rotation of the knee increases this pain. Sometimes, on physical exam, one can actually hear a clunk when the meniscal fragment moves across the surface of the joint. Sometimes the pain is quite severe and even limited walking is prohibited by the pain. Other times one can be quite active – jogging and playing tennis – and only with certain rotational movements will the pain return. As the presentation of torn menisci are variable, likewise the treatment is very variable. If the patient's knee is locked, the dislodged meniscus must be removed. If the torn meniscus causes pain and inflammation, a standard program of rest, ice, compression, elevation, and early rehabilitation is appropriate. Aspiration of the joint to decrease the fluid content may be helpful if this is a major problem. Non-steroidal, anti-inflammatory medications can assist in reducing the inflammation and occasionally an injection of Cortisone is helpful along the same line.

There is a debate whether menisci that are torn should be removed or not. Certainly more and more, we are trying to save meniscal fragments. In the young athlete, meniscal repair should be considered. The difficulty is that most tears are not reparable. The meniscus itself normally doesn't heal because the tears go through the

avascular area of the menisci. Certain peripheral tears, particularly in younger people, can heal and some of these, when identified at the time of surgery, should be repaired. The problem with repair is that this is a major operation often requiring opening of the joint and casting for six to eight weeks – non-weightbearing with crutches during that time. Vigorous activity is also excluded for approximately six months afterwards.

The traditional treatment has been excision of the torn meniscal fragment through the arthroscope. This often gives a quick and rapid recovery. Only the torn fragment is removed at the time of surgery and the edges are smoothed out to give no irregular surfaces to catch on the joint. The question often arises, "What will happen to my knee if part of the meniscus is removed?" In the days of open meniscectomy, the entire meniscus was removed and many people, twenty to thirty years later, did have arthritic symptoms in their knee from the removal of the meniscus. With the recent advent of arthroscopic techniques and partial meniscectomy, we are hoping this will not be the case. Recent studies have shown little progression of arthritic changes after partial meniscectomy five years later. Long-term studies are necessary, however, to give us the correct answer.

At this point, if the meniscus is torn, it is not doing its function and is most likely better removed than staying in the joint causing inflammation. Some recent studies have also shown these torn meniscal fragments can cause damage to the articular surfaces if they repeatedly become displaced.

### **MOST FREQUENTLY ASKED QUESTIONS ABOUT KNEE CARTILAGE TEARS**

Q. *How does the cartilage get torn?*

A. The tear is usually caused by falling and twisting the knee. The inside knee cartilage, the medial meniscus, is torn four times more frequently than the outside knee cartilage, the lateral meniscus. This usually occurs with the foot planted and one twists the upper body. There is usually a momentary pain although this is often not severe and one can usually return to sporting activities. It is usually the next day that some stiffness and pain occurs.

Q: *Does torn cartilage heal?*

A. In most cases, it does not. Tears that occur in this very peripheral rim in younger people will heal, but most tears in the major body will not because of the lack of blood supply.

Q. *Will I need surgery?*

A. The decision for operative intervention for a torn meniscus depends upon the degree of symptoms that one is having. If the knee is locked and cannot be straightened, surgery is necessary. If simply one has symptoms from a torn meniscus, the persistence and severity of the symptoms help decide whether surgery is warranted. When a meniscus tears, there is a feeling of giving way in the knee and the knee sometimes will fill with fluid. Tears range from minor to significant, the most obvious causing your knee to lock. With minor tears you are able to recover in a few days and return to normal activities. Since most tears do not heal, you will be reminded from time to time that something is not right. Some days you'll notice nothing, other days you may experience a little pain or swelling due to your activities. You may sometimes experience a sharp pain if you twist your knee in a normal fashion. If you continue to have pain, swelling, and giving way then the surface of the knee joint can be damaged resulting in arthritic changes.

Q. *What is arthroscopy?*

A. Arthroscopy means looking into the inside of the knee joint with a small telescope. This is a highly accurate and safe way to determine the status of the internal structure of the knee. During the procedures, the surgeon is able to view the interior of the knee on a TV screen. He is then able to remove a torn portion of the cartilage with special instruments.

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