

Meniscal Transplant Surgery

The meniscus is a C-shaped cushion of cartilage in the knee joint. When people talk about torn cartilage in the knee, they are usually referring to torn meniscus.

If a meniscus is so badly damaged it cannot be repaired, it may need to be removed or trimmed out. Without the meniscus cushion, persistent knee pain and arthritis can develop.

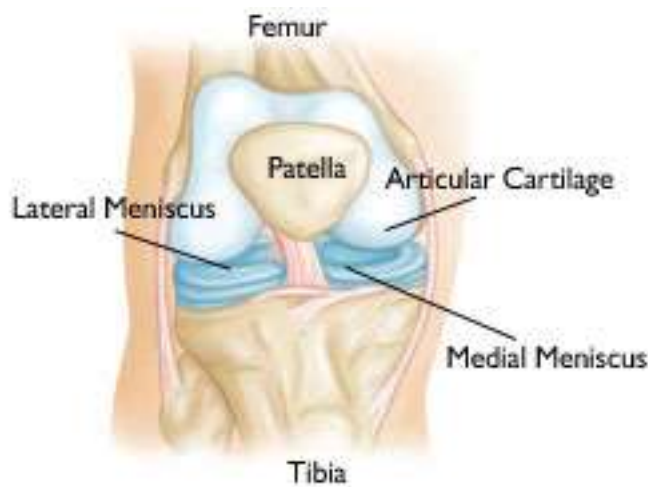
For many older patients with this condition, a knee joint replacement might be the right option. But active people younger than 55 may be eligible for an alternative treatment: meniscal transplant surgery.

A meniscal transplant replaces the damaged meniscus with donor cartilage.

Meniscal transplants are not right for everyone. If you already have arthritis in your knee, a meniscal transplant may not help you. But for a select group of people, meniscal transplants can offer significant pain relief.

Anatomy

Three bones meet to form your knee joint: your thighbone (femur), shinbone (tibia), and kneecap (patella). Your patella sits in front of the joint to provide some protection.



Normal knee anatomy

The ends of your thighbone and shinbone are covered with *articular cartilage*. This slippery substance helps your knee bones glide smoothly across each other as you bend or straighten your leg.

Two wedge-shaped pieces of *meniscal cartilage* act as "shock absorbers" between your thighbone and shinbone. Different from articular cartilage, the meniscus is tough and

rubbery to help cushion and stabilize the joint. Each knee has two menisci, one on each side of the joint.

Description

If your meniscus is severely damaged or has been removed, it is likely that the articular cartilage protecting your knee will begin to wear. As this cartilage wears away, it becomes frayed and rough. Moving the bones along this exposed surface is painful. This condition is osteoarthritis.

The goal of meniscal transplant surgery is to replace the meniscus cushion before the articular cartilage is damaged. The donor cartilage supports and stabilizes the knee joint. This relieves knee pain. The hope is that the transplant will also delay the development of arthritis, but long-term results are not yet available.

Allograft Preparation

Healthy cartilage tissue is taken from a cadaver (human donor) and frozen. This tissue is called an allograft. It is sized, tested, and stored. Correct sizing is one of the most important factors in the success of the transplant. Later, the allograft will be matched by size to a candidate for the procedure.

Allograft Safety

A screening process is done before selecting a possible donor. Someone who knows the donor well is interviewed to help identify risk factors that would prevent the use of the donor tissue.

Once selected, the donor tissue undergoes many tests. The tissue is tested for viruses like those that cause HIV/AIDS, West Nile virus, hepatitis B and C, as well as for bacteria.

Patient Eligibility

Although meniscal transplants have been performed for more than 20 years, the procedure is still relatively uncommon. This is largely due to the strict criteria patients must meet to be considered for the procedure.

Most people with severe meniscal problems have also developed arthritis in the knee. If the articular cartilage has worn away too much, a meniscal transplant will not be helpful.

The criteria for meniscal transplant include:

- Younger than 55 years and physically active

- Missing more than half of a meniscus as a result of previous surgery or injury, or a meniscus tear that cannot be repaired
- Persistent activity-related pain
- Knee with stable ligaments and normal alignment
- No or minimal knee arthritis
- Not obese

Surgery

Meniscal transplant surgery is an arthroscopic procedure. It can be performed on an outpatient or inpatient basis. Whether or not you will need to stay overnight at the hospital will depend on your medical needs.

Procedure

Knee arthroscopy is one of the most commonly performed surgical procedures. In it, a miniature camera is inserted through a small incision. This provides a clear view of the inside of the knee. Your orthopaedic surgeon inserts miniature surgical instruments through other small incisions to do the procedure.

Typically, a 2- to 4-inch incision is made in the knee with a few other small "poke" holes. The new meniscal tissue is anchored into the shinbone to stabilize the transplant. More stitches are placed into the meniscal transplant to sew it into place.

Surgical Complications

The risk of complications from meniscal transplant surgery is very slight. Stiffness, reoperation, and incomplete healing are the most common complications.

Other risks include bleeding, infection, and nerve or blood vessel injury.

The risk of getting an infection from donor tissue is small, but it has happened. You are twice as likely to be struck by lightning (1 in 800,000 chance) than to contract HIV from a meniscal transplant (1 in 1.6 million chance).

Rehabilitation

Immobilization. You will need to wear a knee brace and use crutches for the first 4 to 6 weeks after surgery. This gives the transplanted tissue time to become firmly attached to the bone.

Physical therapy. Once the initial pain and swelling has settled down, physical therapy can begin. Specific exercises can restore range of motion and strength.

A therapy program focuses first on flexibility. Gentle stretches will improve your range of motion. As healing progresses, strengthening exercises will gradually be added to your program.

Return to daily activities. Most patients are not able to return to work for at least 2 weeks. Many patients with active jobs require 2 to 3 months of rehabilitation before they resume their jobs. Your doctor will discuss with you when it is safe to return to work, as well as any sports activity. Full release is typically given 6 to 12 months after surgery.

Outcome

Many factors contribute to the success of a meniscal transplant. These include:

- The condition of the knee at the time of surgery
- Correct sizing of the transplant
- The technique of placing the tissue
- Commitment to rehabilitation

The research studies that have been done on meniscal transplants are not perfect. Overall, between 21% and 55% of transplants fail within 10 years. Meniscal transplants on the outside (lateral) part of the knee are more successful than those on the inside (medial) of the knee.

Synthetic (artificial) meniscal tissue has been tried, but there is conflicting information at this time.

Meniscal transplants can be quite helpful, but are not a good option for every patient. For patients who are carefully and correctly selected, meniscal transplant surgery can provide significant benefits.