

New Techniques for Improving Knee Surgery Outcomes



Dr. Prodrimos uses the KT 1000 arthrometer which is far more accurate than MRI for diagnosing ACL tears.

Rachel (not her real name) was 17 years old and essentially disabled by what had been diagnosed as a painful dislocated kneecap that had resisted all attempts at treatment. Her knee had given way, causing her difficulty in walking and being stable on stairs. She was unable to participate in sports, but the MRI report had not shown any significant abnormality in her knee, so she sought another opinion from noted orthopedic knee specialist, Chadwick (Constantinos) Prodrimos, in Glenview, Illinois. By using a device called the KT 1000 arthrometer, Dr. Prodrimos was able to find that, despite the negative MRI, Rachel actually had a torn anterior cruciate ligament (ACL), which led to her knee instability. Upon further examining her, Dr. Prodrimos found a second serious problem: the instability caused by the ACL tear had knocked off a large piece of the articular cartilage, the glistening, super-smooth coating of the knee surface that allows the joint to glide. This defect exposed rough bone in the joint, essentially creating a “pothole” which caused the knee to painfully catch and lock.

To remedy the first problem, Dr. Prodrimos took a graft from part of Rachel’s hamstring tendon to make a new ACL. To remedy the cartilage defect, he took a tiny specimen of cartilage cells that are normally discarded to make room for the ACL graft and sent them directly from surgery to genezyme biosurgery in Cambridge, Massachusetts, where they were isolated and grown in tissue culture for three weeks. The newly grown cells were then flown back the night before another surgical procedure: autologous chondrocyte implantation. At this time, a film of periosteum, the coating of the tibial bone that has special tissue growth-promoting properties, the same size as her cartilage defect, was carefully removed. It was sutured into the healthy cartilage surrounding the hole in her knee and sealed with special biologic glue. Dr. Prodrimos then injected Rachel’s own greatly expanded cartilage cells under this water-tight “patch” into the “pothole” defect. For two weeks after the surgery, while she rested at home, Rachel used a machine that continuously and painlessly moved the knee to nourish the cartilage.

Rachel made a complete recovery, danced extensively at her wedding three years later, and had a baby. Now, five years after the surgery, she has no pain or instability. Recently, Rachel’s mother told Dr. Prodrimos that he had “saved” her daughter’s life.

“The last five years have seen dramatic advances in our ability to repair damaged joints, especially the knee, using FDA-approved, highly successful cutting-edge techniques,” Dr. Prodrimos says. “The mantra

of this emerging field of knee restoration is ‘restore, don’t replace.’” Dr. Prodrimos is one of a handful of orthopedic surgeons in the Chicago area who employ these cutting-edge procedures.

Anterior Cruciate Ligament Reconstruction

There are more than 100,000 ACL reconstructions performed in the U.S. each year. This ligament tears in famous athletes and ordinary folks like Rachel. Its insidiousness derives from the fact that, untreated, it produces pain and instability and usually leads to severe degenerative arthritis of the knee, often resulting in the person’s getting his or her knee replaced at a relatively young age. Patellar tendon grafting, a technique for repair devised in the 1980s, has worked reasonably well but has failed in 5%–10% of knees—even in the hands of the best surgeons. While occurring infrequently, complications, such as the post-operative patellar fracture suffered by future Hall of Fame NFL wide receiver Jerry Rice, can be quite severe. Kneeling pain is very common. In the early 1990s, several surgeons, including Dr. Prodrimos, began using a quadrupled hamstring graft instead of patellar tendon. This graft is twice as strong as a patellar tendon graft and has not been associated with other complications. Recently, Dr. Prodrimos reported the results of an extensive analysis of all the patellar and hamstring graft ACL reconstructions published since 1990, which showed that the normal stability rate was higher and the failure rate lower with hamstring than patellar tendon overall as seen in an analysis of 56 separate studies. Moreover, patients with hamstring graft with the fixation had the most stable knees. A newly developed procedure allows for a one-inch incision creating minimal scars that often virtually disappear.

Restoring normal knee cartilage

Autologous Chondrocyte Implantation was Rachel’s second procedure. This is the only procedure that can restore nearly normal cartilage to the knee. It is FDA approved and boasts an 85% success rate. Unfortunately, it is generally unsuitable for people over 55 years old or for those with severe arthritis. Dr. Prodrimos recently performed the first such graft in an ankle in the state of Illinois.

Using the patient’s own cells

Meniscal Allograft Transplantation is used when the cushioning meniscus has been removed or when an individual is experiencing pain or degeneration. A cadaver meniscus can be implanted that allows immediate weight bearing and a return to sports within six months. The patient’s own cells repopulate the graft, bringing it “to life.” Success rates are in the 90% range, and complications are rare.

Partial vs. full knee replacement

If you have to “replace,” it is better to replace only partially if possible. Unicompartmental knee replacement, which involves replacing only the diseased part, is used if most of the biologic knee can be left intact. “This results in better function than with total knee replacement,” according to Dr. Prodrimos.