ACL Reconstruction – Choosing the right graft for you

For ACL (anterior cruciate ligament) surgery, we perform an anatomic reconstruction of the ligament. That is, we replace the damaged tissue with new tissue. There are several options to choose from for a graft to replace your ACL. The ACL is reconstructed with a tendon and over time your body grows blood vessels into that tendon and remodels the tendon into a new ligament. This process is called “ligamentization” and takes approximately 9 – 12 months.

Dr. Nathe uses several different graft options based on the patient’s goals and expectations from surgery. His goal is to educate the patient about the benefits and drawbacks of each option, and to empower the patient to make the right choice for himself or herself. The first decision is to decide if you would like to use a tendon from a cadaver (allograft) or from yourself (autograft). The biggest difference between the two graft options is the rate of retear (failure) of the reconstructed ligament after surgery. For young people, there is a very high risk of re-tear with allograft tissue and autograft is recommended. For people over the age of 35, the difference becomes less substantial and allograft becomes a reasonable option. See the chart below for risk of re-tear based on age and graft type.
In addition to a lower rate of re-tear, autograft has been shown in the best multicenter study to date to have higher return to sports. It has also been shown to have higher knee function scores as rated by the patient at 2 and 6 years after surgery.

Allograft carries risks of disease transmission, but this risk is thought to be very small. The risk of viral infection with hepatitis or HIV is thought to approach, but not reach zero with today’s screening and sterilization methods. One recent study did not show an increased risk of bacterial infection with allograft.

If autograft is superior, then why choose allograft? For the average patient that is not a high level athlete, the allograft may prove to work just as well. Also, newer and lower dose irradiation sterilization protocols are thought to decrease the risk of re-rupture seen in previous studies. Additional advantages of allograft are less pain, faster return to work, no donor site pain (pain from where the graft was taken), and smaller incisions. For the average recreational athlete over the age of 35 with a full time job allograft is a good option for ACL reconstruction.

If you decide to use autograft then there are two options. Two of the hamstring tendons or the middle 1/3 of the patellar tendon with a piece bone from the knee cap and a piece of bone from the patellar tendon insertion on the tibia (bone tendon bone). The advantage of the hamstring tendon option is a smaller scar and less postoperative pain leading to easier recovery in the first few months compared to the patellar tendon. The disadvantages of the hamstring tendon are chronic hamstring pulls (rare) and a weakened hamstring muscle group. For the high level explosive athlete, losing 10 – 20% the strength of the hamstring can be the difference between excelling in his or her sport and just being a good player. For this reason, athletes like Derek Rose and Adrian Peterson have chosen the bone tendon bone patellar tendon autograft. Although the studies have shown nearly identical results for the average person for hamstring and patellar tendon autografts, most high level athletes choose the patellar tendon option because they will not be left with any functional weakness after appropriate rehabilitation. Also, the hamstring muscles are co-stabilizers for the ACL and some believe it is detrimental to weaken them in the setting of ACL injury. The disadvantages of the patellar tendon option are that it is the most painful and the hardest to rehab in the first few months, you have a larger scar directly over your knee that is less cosmetic and can be painful to kneel on, and some patients experience some chronic pain from the site of graft harvest. This graft is avoided in people (plumbers, etc) that have to do a lot of kneeling because it can be painful to kneel on the scar.

In summary, ACL reconstruction surgery consists of replacing your torn ligament with a tendon so that your body can make it into a new ligament. Allograft or autograft tissue can be used. In young people allograft has a high failure rate and is generally avoided except in special situations. For older athletes, it is an acceptable option and has an easier early recovery. Autograft is associated with lower re-rupture rates and higher knee function. Hamstring tendons are the most common autograft used and are a great option. Patellar tendon autografts are the hardest to
rehab and most painful, but leave you without functional weakness and is the preferred graft for high level athletes with time and dedication to perform aggressive rehabilitation.

