

What Type of Graft is Right for Your ACL Reconstruction?

ROBERT BENTS, MD

Injuries to the *anterior cruciate ligament (ACL)* of the *knee* are common in athletes but also occur in older, active adults. What type of tissue graft works best to reconstruct your ligament? Should it be an *autograft* (taken from your knee) or an *allograft* (donor tissue from a donor bank)?

Besides the allograft vs. autograft decision, there are two common locations where the tissue can be harvested. The first is from the *patellar tendon* just below the kneecap. This graft is referred to as the *bone-patellar tendon bone (BPTB)* graft. As the name suggests, the harvested tendon comes with a small piece of bone from the patella.

The second is a *hamstring* graft. Tissue is taken from one or two separate sites of the *hamstring muscle*. Each graft is folded over to form a *quadruple* (four-part) graft. This is the strongest graft and referred to as *quadruple hamstring* graft.

No matter which type of graft is used, surgeons agree that the results are better when the reconstruction duplicates the natural anatomy. The graft tissue is placed inside the knee using tunnels that are predrilled through the bone. Arthroscopy is used to ensure proper placement of the tunnels. Titanium buttons or absorbable screws hold the graft in place until it is incorporated into the tunnel and healing takes place. Proper post-operative reconstruction is crucial to the success of the surgery.

We will ask several questions to determine which graft is best for your knee. Age and activity level are the most important. Gender is noted as well. Statistically, females are more likely to experience graft failure with hamstring autografts. Looser ligaments may be part of these results.

Autografts involve donor site *morbidity* -- in other words, problems that develop where the tissue was taken from or harvested. Bone-patellar tendon-bone autografts present potentially more donor site problems. There can be pain when kneeling or diving for a ball. Fracture of the *patella* (kneecap) and loss of knee extension are two other possible complications of BPTB grafts. This graft does often allow earlier return to sports, however. It is less likely to stretch out compared to the *hamstring graft*, especially in young females. These features of the BPTB graft make it a better choice for the active young adult who is eager to get back into strenuous sports activity.

Hamstring grafts utilize a smaller, more cosmetic incision. There are fewer problems at the donor site but the graft usually takes longer to heal compared with the BPTB graft. Athletes must rehab a full month longer in most cases. The rehab program must pay close attention to getting full hamstring strength back. The risk of graft stretching and losing tension may be greater with a hamstring graft. Some athletes may complain of less speed with sprinting due to hamstring weakness.

Studies also show that graft failure may be slightly higher with the hamstring graft in females. Women usually have greater knee laxity (looseness) than men so the hamstring graft may not be ideal for aggressive female athletes.

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Allografts require no harvest so usually this can be performed “all-inside” through very small incisions. The allograft does take longer to incorporate into the bone tunnels and therefore is usually not used in young athletes who have a timeline for return to sports. Additionally, several studies show a higher failure rate of allografts in young athletes.

Here's a summary of my preferences for ACL grafts:

- Bone-patellar tendon bone autografts are preferred for most young (less than 30 years old), active, high-level athletes who play aggressive sports. (Football, basketball, soccer, snowboarding, etc.)
- Hamstring autograft is recommended for most patients between 30-40 years old who are active and desire a return to sports, skiing, etc. Some younger patients may prefer a hamstring if they desire a smaller or less painful incision or if they don't want pain with kneeling.
- For those over 40 we begin to consider allograft reconstruction. We have had great success using allograft for patients up to 60 years old. In many cases we can perform “all-inside” graft reconstruction with allografts meaning that it is all done through the arthroscope without any long incisions. Allografts are preferred for ACL reconstructions that must be revised as well as for reconstruction of multiple ligament (i.e. PCL) damage of the knee.

As each patient faces the decision of choosing one graft over the other, conversation with the surgeon is important. Selecting the graft type is a personal choice based on each patient's needs, activity level, goals, and preferences. Dr. Bents has been performing ACL reconstructions since 1993 and has significant experience with modern techniques. He will work with you and your physical therapist to ensure the best result possible for your knee.