Options for ACL Graft

Patient Handout

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Background

The Anterior Cruciate Ligament (ACL) is a ligament that connects the two bones of your knee together to stabilize the joint. When it is torn, the knee can feel unstable. In general, the ACL has a poor propensity to heal and therefore is typically not “repaired”, instead, it is reconstructed using a different tendon. The tendon that is used is either harvested from the patient (autograft) or it is taken from a cadaver donor (allograft). Various types of tendons are used for ACL reconstruction.

What are my options?

There are different advantages and disadvantages unique to each graft choice. However, minimal differences have been shown between muscle strength, function, return to sport or patient satisfaction between each choice. Graft choice should be individualized for each patient and should be based on age, activity level of the patient, and consideration of characteristics of each patient such as job/career and level/type of sports participation. In general, ACL reconstruction in patients above the age of 40 have similar outcomes and failure rates when using autograft or allograft, but it is important to discuss with your surgeon regarding graft choice, as this decision is based on many factors and should be tailored to each individual patient.

AUTOGRAFT

Advantage	Disadvantage
- Better healing potential - More predictable incorporation - Low risk of re-tear	- Pain at harvest site - More painful during early recovery

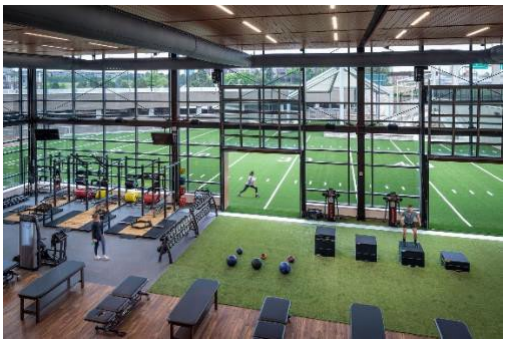
ALLOGRAFT

Advantage	Disadvantage
- No donor site morbidity - Smaller incisions - Shorter surgical time - Quicker and less painful early recover	- Higher risk of re-tear - Theoretical risk of disease transmission

Autograft Types

Graft Type	Advantages	Disadvantages
Hamstring Tendon	- Small incision - Less painful donor site with quicker recovery - Less pain with kneeling/squatting activities - Does not affect knee extensor mechanism	- Hamstring weakness - Less predictable size and require allograft augmentation - Higher graft re-rupture risk - Longer graft incorporation
Bone-Patellar Tendon- Bone (BTB)	- Bone to Bone healing with fastest graft incorporation - Longest history of use and return to sport - Lowest re-rupture rates	- Donor site knee pain, esp. with kneeling - Risk of patellar fracture, patellar tendon rupture - Growth plate disturbance in skeletally immature patients - Larger incision
Quadriceps Tendon (with or without Bone)	- Small incision - Less kneeling pain compared to BTB - Re-rupture rates similar to BTB - Does not affect growth plate in young patients (if no bone taken)	- Donor site morbidity, can lead to quadriceps weakness - Patellar fracture (if bone taken)

What if I am at high risk for re-tear?



In patients who are at high-risk for failure, the surgeon may elect to augment the reconstruction with an additional stabilization procedure on the outside of the knee known as a **lateral extra-articular tenodesis**. This usually involves tensioning of the outside of the knee using the iliotibial band using an additional incision on the outside of the knee, strengthening the reconstruction to prevent failure in high-risk cases. This typically is utilized in revision surgery in younger, higher activity level patients, and in patients with generalized ligament laxity or who have clinical exam findings consistent with significant knee instability.

References

1. Buerba, Rafael A. MD, MHS; Boden, Stephanie A. MD; Lesniak, Bryson MD. Graft Selection in Contemporary Anterior Cruciate Ligament Reconstruction. JAAOS: Global Research and Reviews 5(10):e21.00230, October 2021
2. Quinn, Matthew MD; Lemme, Nicholas MD; Morrissey, Patrick MD; Fadale, Paul MD; Owens, Brett D. MD. An Update on Emerging Techniques and Considerations in Revision Anterior Cruciate Ligament Reconstruction. JBJS Reviews 12(7):e24.00047, July 2024
3. Getgood AMJ et. al, Lateral Extra-articular Tenodesis Reduces Failure of Hamstring Tendon Autograft Anterior Cruciate Ligament Reconstruction: 2-Year Outcomes From the STABILITY Study Randomized Clinical Trial. Am J Sports Med. 2020 Feb;48(2):285-297.