Graft Choice for a High-level Athlete

A 20-year-old collegiate basketball player landed awkwardly. He has a positive Lachman test, but no other instability is noted. Sagittal (A) and coronal (B) magnetic resonance images are shown.

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Brian Sennett, MD: In the review of this individual’s history of injury, physical examination findings, and radiographic imaging, it is clear that the individual has sustained a tear of the anterior cruciate ligament (ACL). In this young individual, I would recommend that he undergo surgical intervention with an ACL reconstruction.

First, with respect to the timing, I would schedule the surgery within 1 to 3 weeks after the injury and after the patient had recovered range of motion. If the patient was restricted with respect to range of motion at the initial evaluation, I would place the patient into “prehab,” which is preoperative physical therapy focused on decreasing inflammation, regaining range of motion, and improving muscular strength. This does not usually delay the surgery, but rather increases the percentages that the patient is ready to proceed with reconstruction.

With respect to graft selection, I would recommend the use of a bone–patellar tendon–bone autograft for its early incorporation of the bone plugs at each tunnel and the published literature indicating the long-term success of the graft. I would select an autograft for this young, elite-level athlete due to some concerns in the literature with respect to allograft failure rates in the young, athletic population.

The exceptions to this choice include a basketball player with an extremely long...
patella tendon or one with chronic patella tendinitis, both of which could be encountered in a 20-year-old basketball player. I would avoid the use of an autograft patella tendon in a case where I would definitely encounter graft–tunnel mismatch.

I also would avoid the use of the autograft patellar tendon in patients with chronic patellar tendinitis due to the possible tendinopathic changes in the graft. In these 2 scenarios, I would select a non-irradiated allograft bone–patellar tendon–bone graft. I have used this graft in many young collegiate athletes with excellent results and would not hesitate to use it in the basketball player with chronic patellar tendinitis or a significantly long patellar tendon.

Dean Taylor, MD: Assuming that this patient’s priority is to return to sport in the shortest period of time with the lowest rate of reinjury, I would recommend a bone–patellar tendon–bone autograft. Using an allograft in this patient is inappropriate due to a higher probability of graft failure compared with autografts.

One could argue for using either a hamstring or a bone–patellar tendon–bone autograft in this case. In a randomized clinical trial from West Point,\(^2\) no difference was found in retear rates or patients’ reported outcomes between 4-strand hamstring and bone–patellar tendon–bone autografts. However, a higher Tegner activity score was found in the bone–patellar tendon–bone group. Also, when hamstring grafts reteore, they did so within the first year in 3 of 4 cases. hamstring grafts also take longer to heal within bone tunnels\(^3\) and are associated with significant loss in HS muscle function, especially in the first year after ACL reconstruction.\(^4\)

The decrease in hamstring strength puts the ACL graft at increased risk because the hamstrings, acting as antagonists to the quadriceps, dynamically protect the ACL against the quadriceps-generated anterior tibial translation injury mechanisms seen in noncontact ACL tears.\(^5\)

The combination of these 4 findings associated with hamstring grafts—lower Tegner scores and early graft tears in the HS group, delayed tunnel healing, and early hamstring muscle weakness—leads me to recommend bone–patellar tendon–bone grafts for my competitive athletes who want the earliest possible return to sport. Using bone–patellar tendon–bone graft will give the 20-year-old basketball player presented in this scenario the best chance to return to sport in the shortest period of time while minimizing his risk of reinjury.

REFERENCES


Drs Sennett and Taylor have no relevant financial relationships to disclose.

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