

# Knee Anterior Cruciate Ligament Injuries

## Common Problems and Solutions



James E. Christensen, MD, Mark D. Miller, MD\*

### KEYWORDS

- Anterior cruciate ligament reconstruction • Complications • Knee arthroscopy
- Knee surgery • Autograft

### KEY POINTS

- Anterior cruciate ligament (ACL) complications are rare entities, but the complications can represent significant morbidities for patients.
- More common complications for ACL reconstruction include tunnel malposition, infection, tunnel osteolysis, fixation failure, fracture, arthrofibrosis, graft site morbidity, and deep vein thrombosis or pulmonary embolism.
- When complications can be anticipated, proper planning, such as computed tomography and proper bone graft options in osteolysis, can help decrease the morbidity associated with them.



Video content accompanies this article at <http://www.sportsmed.theclinics.com>.

### INTRODUCTION

Anterior cruciate ligament (ACL) reconstruction is one of the most commonly performed orthopedic procedures in the United States, with more than 127,000 performed in 2006.<sup>1</sup> Complications are rare in ACL surgery, but given the amount of ACL surgeries performed each year, it does represent a significant amount of patient complications, with the potential for short- and long-term morbidity. ACL complications can include technical failures as well as patient-related factors.

### COMPLICATIONS

One of the most common technical errors that can occur in ACL reconstruction is aberrant tunnel placement, which can lead to ACL failure because it places excessive

---

Disclosure Statement: No disclosures.

Department of Orthopaedic Surgery, University of Virginia, 400 Ray C Hunt Drive, Charlottesville, VA 22903, USA

\* Corresponding author.

E-mail address: [MDM3P@hscmail.mcc.virginia.edu](mailto:MDM3P@hscmail.mcc.virginia.edu)

Clin Sports Med 37 (2018) 265–280

<https://doi.org/10.1016/j.csm.2017.12.006>

0278-5919/18/© 2017 Elsevier Inc. All rights reserved.

[sportsmed.theclinics.com](http://sportsmed.theclinics.com)

stress on the graft. Aberrant tunnel placement can lead to poorer outcomes based on their location and whether the aberrant tunnel is in the tibia or femur, with the femoral side accounting for 80% of aberrant tunnels. When transtibial ACL reconstruction was more common, tunnel placement would often be more vertical and anterior. Transtibial reconstruction can lead to stable-appearing knees, especially in the anteroposterior plane as evidenced with a negative Lachman, but they tend to leave residual rotational instability with a positive pivot shift.

Aberrant tunnel placement in the tibia can cause dysfunction depending on the location of the tunnel. If placed too anteriorly, patients can experience loss of extension as the graft impinges on the roof. Conversely, when the tunnel is placed too posteriorly, posterior cruciate ligament (PCL) impingement can occur, which places greater tension on the graft and can lead to decreased flexion as well as anterior laxity. A tunnel placed too medially can lead to iatrogenic medial plateau fracture. A tunnel placed too laterally can lead to impingement on the lateral wall and lead to attenuation of the graft as well.

As with the tibia, aberrant femoral tunnel placement can lead to ACL failure. For a tunnel placed too far anteriorly, the patient can experience difficulty with achieving full flexion because the graft will impinge on the roof. On the other hand, for a tunnel placed too far posteriorly, the patient can struggle to achieve full extension while having laxity in flexion. If placed too far posteriorly, there is also the risk of posterior wall blowout, which will affect the fixation technique used. Fluoroscopy can be a good intraoperative tool to visualize proper tunnel placement.

One of the common issues encountered with ACL reconstruction, especially as it pertains to revision ACL cases, is tunnel osteolysis or widening. Although the full cause is not fully understood, it may be explained by several factors, including mechanical factors and biologic factors. Mechanical factors can include improper graft tunnel placement and fixation methods. Graft suspension methods can lead to a windshield-wiper effect or bungee cord motion within the tunnels. Biologic factors that may lead to osteolysis include graft type and donor type (allograft or autograft) as well as synovial fluid propagation. Synovial fluid propagation and gravity may also be responsible for the fact that tibial tunnel osteolysis tends to be greater than femoral tunnel osteolysis.

For ACL reconstruction, there are multiple methods of fixation from cortical buttons and suspensory fixation to biodegradable or metal interference screws to tying over a post. As discussed in the section on tunnel widening, suspensory fixation can lead to abnormal motion within the tunnel during the process of incorporation, but it is also important at the time of implantation to ensure that the cortical button properly deploys or that the cortex is competent to avoid early failure. When using interference fixation, it is important that the screws properly “interfere.” When screws diverge more than 15° to 30°, there is an increased risk of bone plug pullout.<sup>2-4</sup>

Postoperative infection is always a concern no matter which surgery is being performed, and ACL reconstruction is no different. Infection is a rare complication in ACL reconstruction (<1%) but can lead to significant morbidity if unrealized and untreated because articular destruction can occur in 11 days. There are some factors that increase the risk of infection after ACL reconstruction. Tobacco use, which has been established through multiple studies to be a preventable cause of morbidity and mortality, has also been associated with an increased risk of infection after ACL reconstruction.<sup>5</sup> Recently, there have been multiple studies that have shown ACL reconstruction performed with hamstring autograft has a higher infection rate than those with bone-patellar tendon-bone (BTB) autograft.<sup>6,7</sup> Studies have not shown an increased risk of infection with BTB autograft compared with allograft reconstruction.<sup>6,8,9</sup> Although rare, infections should be handled expeditiously.

Download English Version:

<https://daneshyari.com/en/article/8797943>

Download Persian Version:

<https://daneshyari.com/article/8797943>

[Daneshyari.com](https://daneshyari.com)