Revision Anterior Cruciate Ligament Reconstruction and Biplanar High Tibial Osteotomy With Custom Osteotomy Cutting Jig

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Background
Primary anterior cruciate ligament (ACL) reconstruction failure often may occur because of underlying instability imparted by unrecognized limb malalignment. A high tibial osteotomy (HTO) can be performed to manage varus malalignment, decreasing medial compartment stress with associated unicompartmental arthrosis and instability. An anterior closing wedge tibial osteotomy can be performed to manage excessive posterior tibial slope, minimizing anterior tibial translation in flexion and, thereby, decreasing graft stress. Combining the two osteotomies can simultaneously manage coronal and sagittal plane deformities at the time of revision ACL reconstruction.

Purpose
This video provides an overview and case presentation and demonstrates revision ACL reconstruction with biplanar HTO for reliable restoration of knee stability and slowed progression of medial compartment osteoarthritis.

Methods
The anatomy of, physical examination of, diagnosis of, and treatment options for revision ACL reconstruction in patients with coronal and sagittal osseous malalignment are reviewed. Surgical indications and considerations, including graft choice, staged versus combined procedure, and uniplanar versus biplanar realignment, are discussed. The case presentation of a 42-year-old man with varus alignment and increased posterior tibial slope who sustained a second ACL graft rupture is reviewed. On presentation, 8 months after re-rupture with persistent symptoms after failed nonsurgical treatment, and after a thorough discussion of the risks, advantages, and prognosis, the patient elected to proceed with re-revision ACL reconstruction with concurrent biplanar HTO.

Results
Posterior tibial slope was corrected from 14° to 7°. The degree of varus angulation also was reduced, increasing medial compartment joint space. Short-term postoperative clinical outcomes showed good range of motion, decreased pain, and an objectively stable knee on physical examination.

Conclusion
Biplanar HTO at the time of revision ACL reconstruction is associated with good long-term survivorship, increased pain relief, and decreased instability.