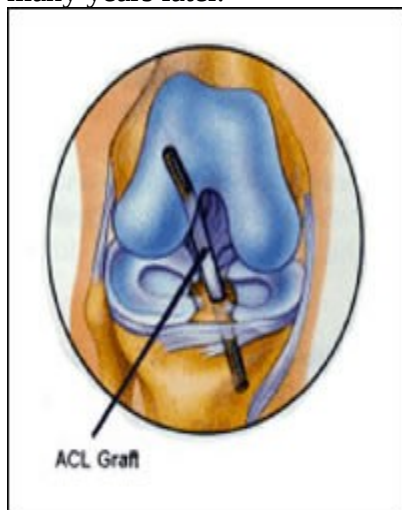


## Restoring the Knee After Anterior Cruciate Ligament (ACL) Injury Using the Anatomic-Double Bundle Technique

Treatment of a once devastating knee injury has evolved! In the all-too-recent past, tearing one's ACL meant the end of an active lifestyle and certainly the end of many promising athletic careers. New advances in surgical technique and an enhanced understanding of the anatomy of the ligament have improved the prognosis for athletes suffering this once-devastating injury.

The ACL is a ligament located in the middle of the knee that connects the femur to the tibia. It is a critical ligament that stabilizes the knee during sports and physical activity. The ACL is usually injured during a pivoting or cutting motion and can occur with or without contact. ACL injuries have become more common as participation in sports has increased. As a result, ACL reconstructive surgery is now one of the most common orthopedic procedures. New advances have greatly improved the surgical technique of ACL reconstruction.

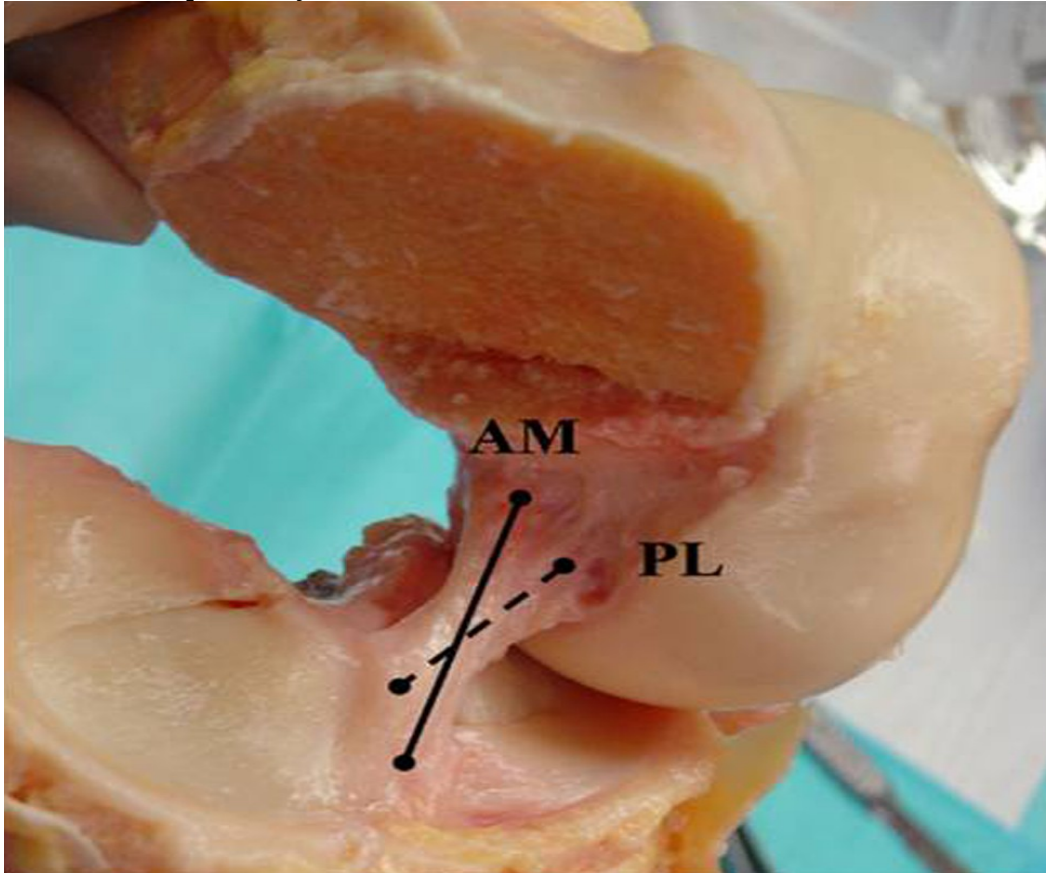
Traditionally ACL reconstruction has focused on reconstruction of a single strand or "bundle" of fibers. The results have been largely successful in restoring knee stability and returning athletes to play. Unfortunately, many still experience some pain and feelings of instability even after successful surgery and rehabilitation. Still, others are unable to return to their previous levels of activity and once-promising athletic careers are ended. Moreover, knees reconstructed with the traditional single-bundle technique may be more prone to re-injury and often develop arthritis many years later.



ACL Reconstruction Single Bundle technique

Vangness CT. ACL Reconstruction Orthopaedic Procedures. 2010. Available at: [http://www.vangnessmd.com/orthoproc\\_acl.htm](http://www.vangnessmd.com/orthoproc_acl.htm). Accessed December 20, 2010.

The latest research may explain these uninspiring results. Through extensive laboratory analysis, we have learned that the ACL is composed of 2 separate and distinct portions or “bundles”. Each functions independently and in concert.



A dissection depicting the double-bundle nature of the native ACL (the medial femoral condyle has been removed). [Reproduced from: Fu F. Femoral insertion site of the anterior cruciate ligament (letter to the editor; <http://www.ejbs.org>.) Journal of Bone and Joint Surgery American, May 24, 2005

It seems reasonable to conclude that reconstruction of only one portion (and ignoring the other) will only accomplish part of the goal—which is to stabilize the knee and preserve the joint from degenerative arthritis. The newest and most progressive surgical technique for ACL reconstruction is called the Anatomic Double-Bundle technique and is superior to the Single-Bundle technique in many ways. Early results suggest that the Anatomic Double-Bundle technique decreases the likelihood and severity of the post-surgical problems associated with traditional Single Bundle technique, while increasing overall knee stability. In addition, the knee is more likely to regain normal range of motion as compared to knees treated non-operatively or with the traditional Single-Bundle technique. This success is accomplished in the Double-Bundle technique by accurately replacing and restoring the native ACL.



Schematic shows double-bundle ACL reconstruction.

Casagrande BC, Maxwell NJ, Kavanagh EC, Towers JD, Shen W, Fu FH. Normal Appearance and Complications of Double-Bundle and Selective-Bundle Anterior Cruciate Ligament Reconstructions Using Optimal MRI Techniques. *American Journal of Radiology*. 2009; 192:1407-1415.

Currently only a select few surgeons are trained in and are performing this ground-breaking technique. It is much more technically demanding to perform, but there is little doubt that, one day, this technique will be “The Standard.”

We have entered a new era in sports medicine. Athletes suffering a once potentially devastating injury may now have a reconstructive surgery to truly restore the knee to its normal state. When suffering a major knee injury such as an ACL tear, surgeons who perform the Anatomic Double-Bundle technique may restore the structures in the knee to a near normal state. You can resume your life of physical activity and sport participation with the confidence that your knee is structurally sound.

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