

Anterolateral Ligament Reconstruction


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Anterolateral Ligament




- 1879 French surgeon (Ob Gyn) Dr. Paul Segond described "pearly, resistant, fibrous band" attached to anterolateral tibia
- Segond fracture pathognomonic for ACL injury




The anterolateral ligament of the human knee: an anatomic and histologic study.
Jovanac DJ, Maignanville BA, Simeoni F, Saperin D, Jacsó M, Shook J, et al. Am J Orthop. 2011 Jun 30;40(6):303-307. doi: 10.1177/0095433811417452. Epub 2011 Jun 30.

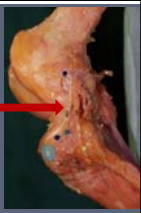
Anatomy of the anterolateral ligament of the knee.
Cohen D, Simeoni F, Maignanville BA, Saperin D, Jacsó M, Shook J, et al. J Acad Orthop Surg. 2013 Oct 22;31(4):321-8. doi: 10.1111/joa.12087. Epub 2013 Aug 1.



Anterolateral Ligament




- ALL attachment on tibia is same location as Segond fracture
- Numerous cadaveric dissections published on ALL and its identified in nearly 100% of specimens
- 80% incidence of ALL injury in patients ACL reconstructed knees by MRI



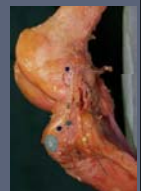
High prevalence of anterolateral ligament abnormalities in magnetic resonance images of anterior cruciate ligament-injured knees.
Claes S, Baethgecrossen S, Bellemans J. *Acta Orthop Belg*. 2014 Mar;80(1):45-9.

The Segond fracture: a bony injury of the anterolateral ligament of the knee.
Claes S¹, Lazzica F², Vermecke E³, Bellemans J⁴. *Arthroscopy*. 2014 Nov;30(11):1475-82. doi: 10.1016/j.arthro.2014.05.039. Epub 2014 Aug 8.

ALL Anatomy




- Variable insertion site anatomy
- 7-8 mm thick
- Femoral attachment
 - Lateral Epicondyle - 8mm posterior and 10mm proximal¹
 - Confluent with LCL attachment
 - 1mm anterior and 4mm distal to LCL²
- Tibial attachment
 - Between Gerdy's and Fibular head
 - 5 - 13 mm below articular surface
- Increased tension in flexion



1. Kennedy MJ, Claes S, Fusco FA, Williams BT, Goldsmith MT, Turnbull TL, Wijdicks CA, LaPrade RF. The Anterolateral Ligament: An Anatomic, Radiographic, and Biomechanical Analysis. *Am J Sports Med*. 2015 Jul;43(7):1595-15. Epub 2015 Apr 17.


2. Helko CP, Demange MK, Bonadio MB, et al. Anatomy and histology of the knee anterolateral ligament. *Orthop J Sports Med*. 1 (2013)

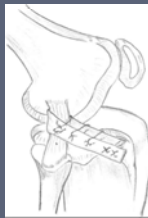
Historical Extrarticular Lateral Tenodesis



- Lemaire
- Macintosh
 - 1, 2, and 3
- Ellison
- Losse
- Neyret/Colombet

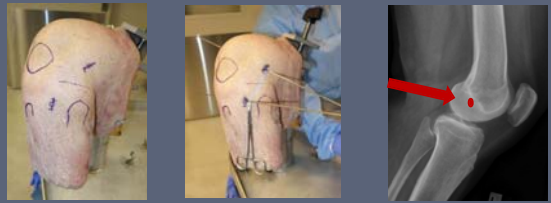
ACL Reconstruction and Extra-articular Tenodesis
Victoria B. Duthon, MD¹, Robert A. Magnusen, MD², Elvire Servien, MD¹, Philippe Neyret, MD¹
Clin Sports Med 32 (2013) 141-153
http://dx.doi.org/10.1016/j.csm.2012.08.013





ALL Reconstruction Technique

SAMMC




1. Femoral pin – Just proximal and posterior to LE
 - Lateral radiograph – 50% of Blumensaat and 3mm below ¹
2. Tibial pin – 10 mm below joint line
 - 1. Use needle arthroscopically to mark joint line
3. 1 cm incisions over insertion sites

Helito GP, Demange MK, Bonadio MB, Tinico LE, Crobbi RG, Picora JR, Gamarho GL. Radiographic landmarks for locating the femoral origin and tibial insertion of the knee anterolateral ligament. Am J Sports Med. 2014 Oct;42(10):2356-62. Epub 2014 Aug 7.

ALL Reconstruction Technique

SAMMC




Suture tied between guide pins and check graft excursion (relative isometry) between flexion and extension

ALL Reconstruction Technique

SAMMC



- Ream 6mm socket
 - 20 mm on femur
 - 30 mm on tibia
- Passing sutures through skin on femoral medial side
- Hemostat to dilate path deep to ITB between incisions
- Pass graft under skin bridge



ALL Reconstruction Technique

SAMMC


- Interference screw (IS) into femoral socket
 - 6mm (line to line)
- Cut excess graft 20mm past socket and reapply whipstitch
- Pull graft into tibial socket
 - 90 degrees of flexion
 - Neutral rotation
- Tibial IS over guide pin



ALL Reconstruction Post Op

SAMMC


- Take through full ROM in OR
- Hinged knee brace for 12 weeks
- Full ROM immediately
- Non weight bearing 6 weeks
 - All revision cases
- Rehab as standard revision ACL
 - BFR protocol




Outcomes after Lateral Tenodesis


SAMMC

- Biomechanically stronger restraint to pivot shift
- More likely to have negative pivot shift (80% vs 63%) when done in conjunction with revision ACL
- Reduce rotational stress on ACL by 40%




Revision ACL reconstruction: Influence of a lateral tenodesis.
Immes C¹, Beaudin P, Bado G, Bassin C, Chassagny V, Csan P, Dubrana F, Ekin S, F.P. Franceschi, J.P. Huet, C. Jouve F, Patel J.P, Saha A, Nour M, Colombet P.
Knee Surg Sports Traumatol Arthrosc. 2012 Aug;20(8):1566-70. doi: 10.1007/s00167-011-1765-6. Epub 2011 Nov 20.



ALL Outcomes 



- Primary concern with adding to ACL reconstruction
 - overconstraint and development of arthrosis
- Historical studies (lateral tenodesis) commonly immobilized the leg for 4-6 weeks and involved "non-anatomic" reconstructions
- Need PRCT ACL revisions with and without

Dodds AL, Gupta CM, Neyret P, Williams AM, Amis AA. Extra-articular techniques in anterior cruciate ligament reconstruction: a literature review. J Bone Joint Surg Br. 2011 Nov;93(11):1440-8. doi: 10.1302/0301-620X.93B11.27932.

Indications ALL reconstruction 

- Not indicated as an isolated
 - poor translation
- ALL with ACL re
 - Revision ACL w
 - r/o MLKJ, techni
 - Multiple failed /
 - Young patient v
 - ligamentous lax
 - Not yet for me

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Questions 





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