Single vs Double Bundle ACL Recon?

Barton R Branam MD

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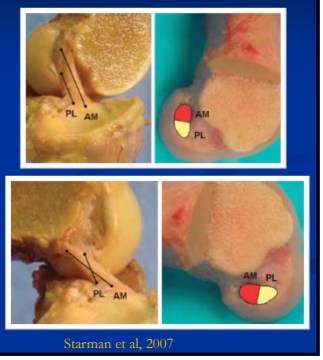
Historical

- Originally the 2 incision technique was most popular
- Endoscopic single bundle technique became the standard
- Double bundle technique has recently evolved as an option

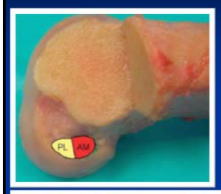
Normal ACL Anatomy

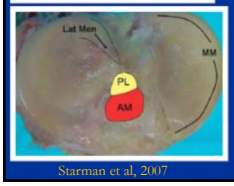
- There are 2 bundles of the ACL
- Anteromedial Bundle
  - Tight in flexion
- Posterolateral Bundle
  - Tight in extension



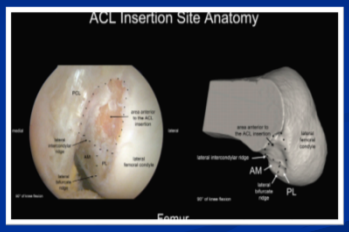
Starman et al, 2007

Normal ACL Anatomy





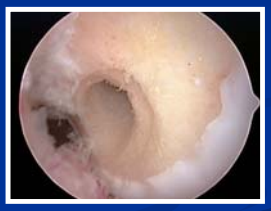
Starman et al, 2007



Romanowski et al, 2009

Anatomic ACL Reconstruction

- Goal is to as nearly as possible recreate the normal ACL with anatomic reconstruction
- Surgeons disagree on the best way to do this

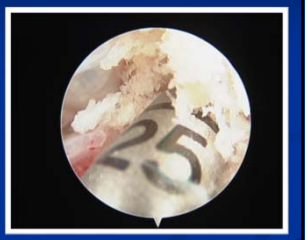


Goals

- Provide the patient a stable, relatively painless knee, that does not swell
- Eliminate the translational (Lachman) and rotational (Pivot Shift) instability of the knee

Current Controversies

- How to drill the femoral tunnel
- Graft type
- Rebirth of 2 incision
- Single vs Double Bundle Reconstruction



Current Literature

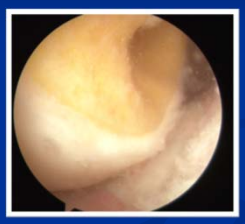
- Karikas et al, AJSM, 2016
  - Prospective Randomized study w HS autograft w 5y f/u→DB not better at improving pivot shift test
- Sasaki et al, AJSM, 2016
  - Prospective RCT DB HS vs, SB PT
  - No sig diff at 24 mo
- Chen & Wang, Int J Clin Exp Med, 2015
  - Comparison of SB versus DB min of 3-year follow-up: a meta-analysis of randomized controlled trials.
  - No diff at long term f/u

Historical

- Data originally was all over the map
- Could get a study to support any position
- There may have been increasing data supporting objective increased stability in DB knees, but no clinical differences

Single Bundle ACL Reconstruction

- Goal is to put the graft in between the two bundles on both sides of the joint
- Femoral side
- Tibial side



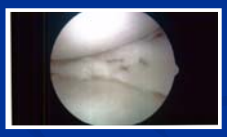
Single Bundle

Advantages
- Straightforward
- Known
- Reproducible
- One larger graft
- Less instruments
- Predictable

Disadvantages
- Less total collagen
- Can be difficult to get graft perfectly isometric
- No individual isometry of separate bundles

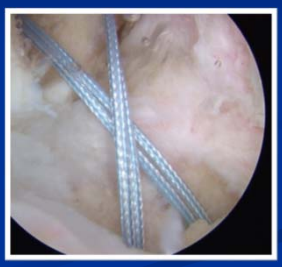
Single Bundle Uses

- Most ACL R
- Graft choices
- Effective
- Save secondary stabilizers
- Previous contralateral successful SB surgery



Double Bundle ACL Reconstruction

- Goal is to recreate the individual bundles with 2 separate grafts
- Two tunnels on femur
- Two tunnels on tibia
- Both isometric

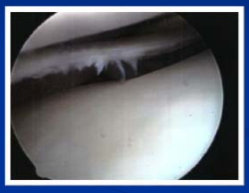


Double Bundle

- Abundant collagen
- Isometrically recreates both bundles
- Useful in Revision cases
- Technically demanding
- Individually smaller grafts
- Abundant instruments
- Abundant fixation
- Longer surgery

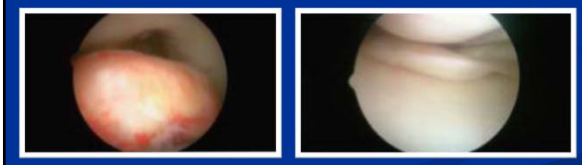
Double Bundle Uses

- Revision surgery
- Loss of secondary stabilizers
- Previous Double Bundle Surgery
- Marked instability

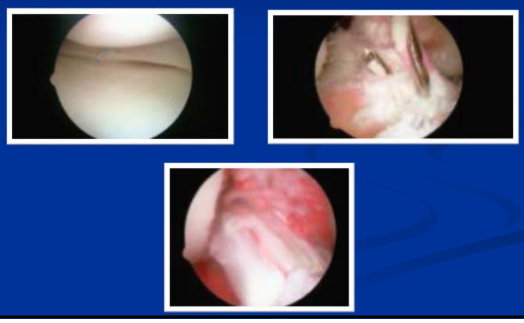


Contralateral DB Recon

- Go with previous success

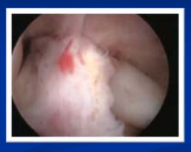


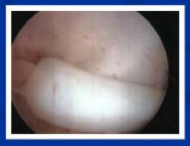
Contralateral DB



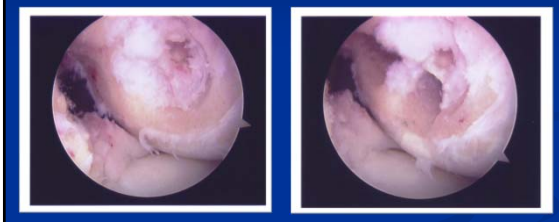
Loss of Secondary Stabilizers

- Posterior Horn Medial Meniscus
- Both menisci
- Marked instability



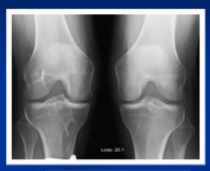


Revision Surgery

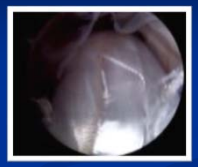


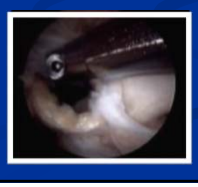
Revision Surgery

- More collagen
- Already failed once(twice)
- Often have secondary stabilizer deficiency
  - PH MM
- Be prepared

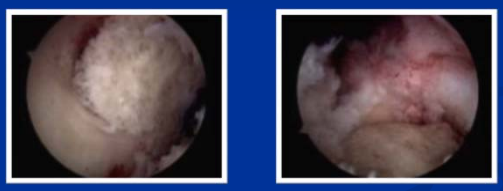


Revision Surgery





Revision DB



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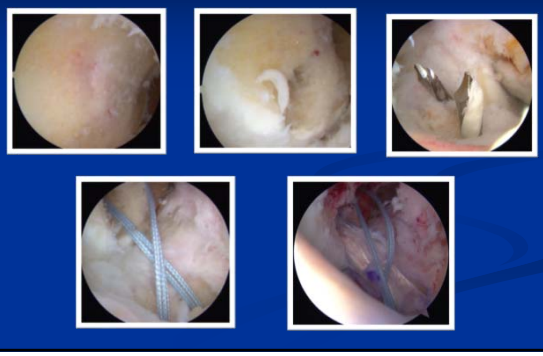

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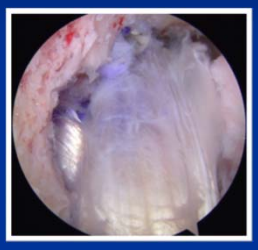
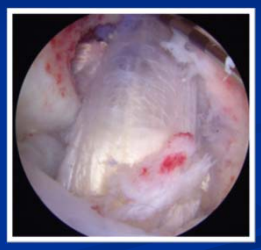



Conclusions

- Data for DB vs SB surgery was conflicting
- Is a role for DB surgery?
  - Evidence may be dwindling
- Another tool for difficult/revision cases

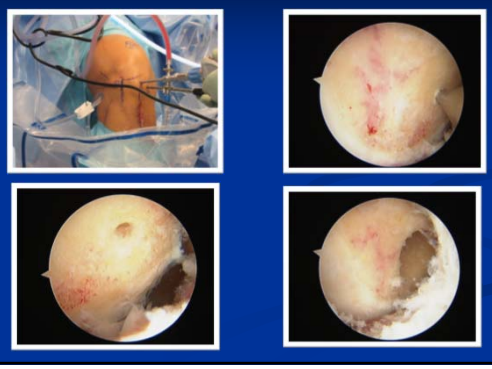
Pearls

- Abundant data regarding the anatomy of the ACL
- Data supports technical error and tunnel malposition as a very common etiology of failure of ACL recon
- Put the tunnels where you want them
- This requires visualization
- Bone graft in revision if any ?

Portals

Pearls

Femoral Tunnel

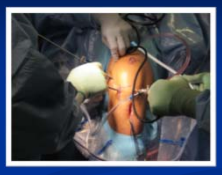


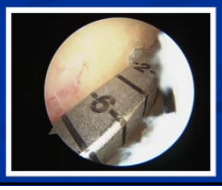
Tibial Tunnel

- Create lateral portal as proximal as possible
- AHLM is most predictable landmark

2 incision

- Inability to hyperflex
- Long patellar tendon
- Peds
- Revisions





Thank You