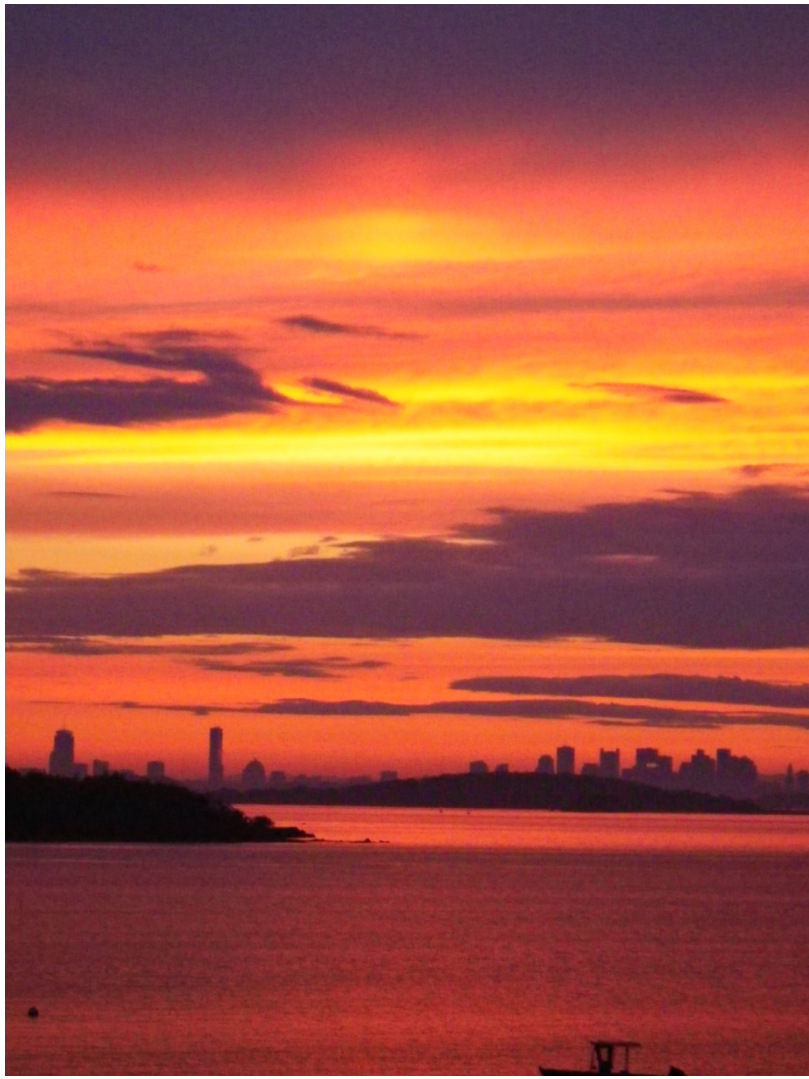
Orthopaedic Summit 2017



5 Complications in ACL Surgery – How to Avoid Them

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Speaker's Disclosure

- **Our fellowships and registry receive support from:**

  Arthrex, DePuy-Synthes, DonJoy, Smith & Nephew, Conmed Linvatec, Zimmer, Stryker

- **Consultant:**

  Smith & Nephew

  DePuy Synthes – Mitek Sports Medicine

  Histogenics

  Flexion Therapeutics

  Visgo Therapeutics

  Amplex

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5 Complications in ACL Surgery
How to Avoid Them

1. Anterior knee pain from patella tendon autograft
2. Inadequate diameter for hamstring autograft
3. Extension loss following ACL reconstruction
4. Infection
5. Multiple failures in the young active athlete

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1. Many Systematic Reviews & Meta-Analyses Confirm Value of B-PT-B Graft

- Just to highlight a few
  - Biau et al. AJSM 2009
    - Individual patient data on 423 patients using up to date hamstring fixation
    - Concluded improved stability with B-PT-B when compared with hamstrings
  - Mohtadi et al. Cochrane Collaboration 2011
    - Pooled data on almost 1600 patients
    - Concluded improved stability with B-PT-B but with an increase of anterior knee problems

Systematic Review (Karlsson – Sweden)

- 2/3's of published comparative studies showed BTB had better stability than HT
- Tendency for increased function in BTB
- Only 60% of studies showed increased anterior knee pan with BTB, and it was predominantly with kneeling
- How do we minimize this????

B-PT-B Autograft Tips: Harvest and Donor Site Treatment are Key

- Preserve the paratenon / pre-patella bursa
- Harvest extra bone from tibia
- Loosely close patella tendon defect prior to closing paratenon
- Graft the patella defect prior to closing paratenon / pre-patella bursa
- Close paratenon / pre-patella bursa

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2. Avoiding Inadequate Diameter for Hamstring Autografts

- **The Influence of Hamstring Autograft Size on Patient-Reported Outcomes and Risk of Revision After Anterior Cruciate Ligament Reconstruction: A Multicenter Orthopaedic Outcomes Network (MOON) Cohort Study**

- **Graft diameter was a significant predictor of the risk of failure**

- **Arthroscopy, 2013**

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MOON Data

Only 25% of grafts >8mm

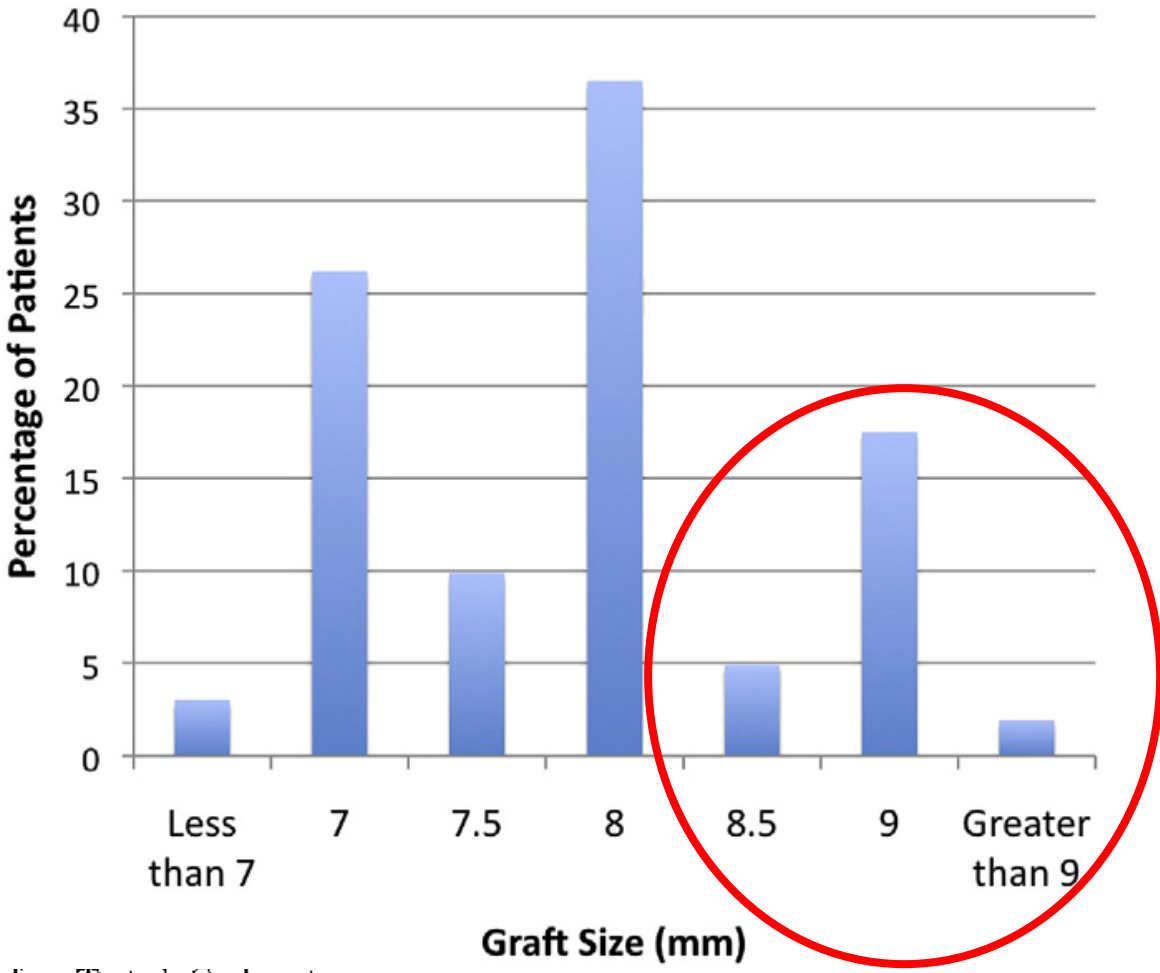

Table 2. Revision Rates by Graft Size for Total Cohort

	No.	Revisions	% Revised
Graft size			
>8 mm	64	0	0
≤8 mm	199	14	7.0
All	263	14	5.3

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MOON Data: Even a bigger problem with a young active patient

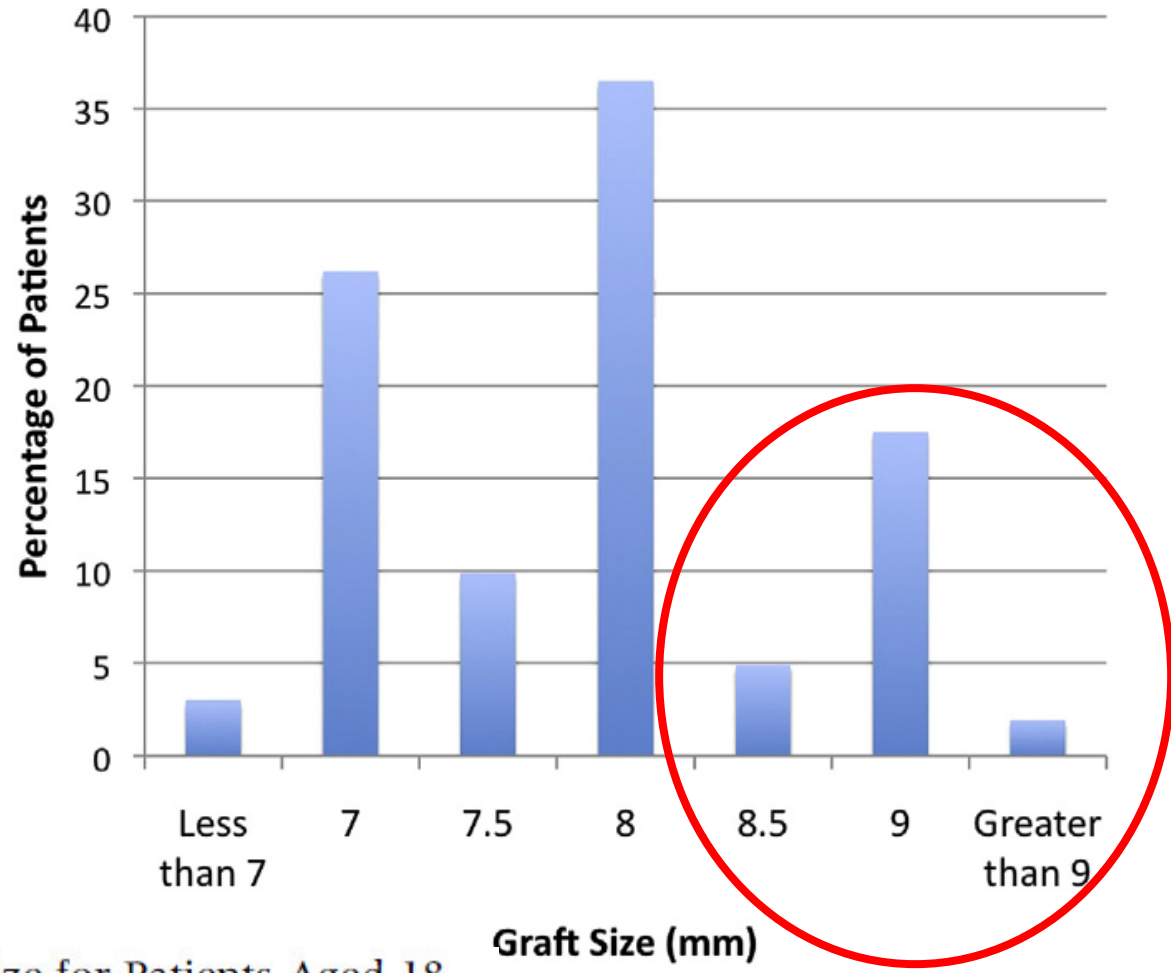

Table 4. Revision Rates by Graft Size for Patients Aged 18 Years or Younger

	No.	Revisions	% Revised
Graft size			
>8 mm	14	0	0
≤8 mm	71	13	18.3
Total	85	13	15.3

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How to Increase the Diameter of a Quadrupled Hamstring Graft

- Quadrupled 7-8cm with 2 adjustable loop flip buttons
- Reliably gives grafts ≥8.5mm diameter, even for small females
- Often just need semi-T tendon for males

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3. Avoiding Extension Loss Following ACL Reconstruction

- Delay acute surgery until full pre-op extension
- Tension your graft in full extension
- Brace in full extension, except for ROM for 1st 10 days post-op
- If it happens – get the scar out early: at 4 months

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4. Avoiding Infection

- **Nakayama et al. Micro-organism Colonization and Intraoperative Contamination in Patients Undergoing Arthroscopic Anterior Cruciate Ligament Reconstruction. *Arthroscopy, 2012***

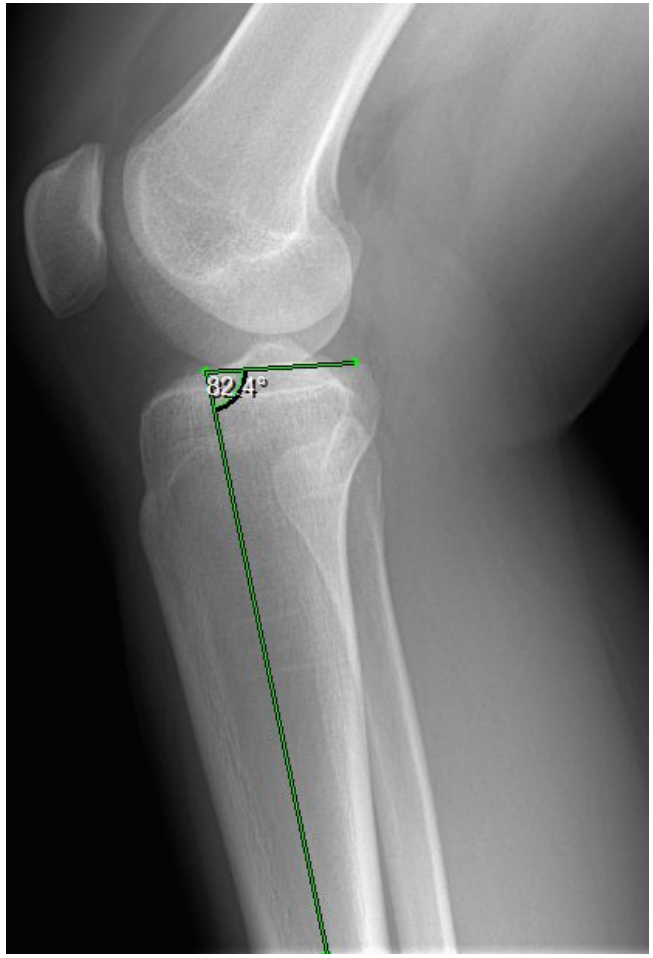
- **Intra-op 6% of skin at incision site and 2% of grafts were culture + for *Coag – Staph,* often methicillin-resistant**

4. Avoiding Infection

- **Vertullo et al. A Surgical Technique Using Presoaked Vancomycin Hamstring Grafts to Decrease the Risk of Infection After Anterior Cruciate Ligament Reconstruction. *Arthroscopy, 2012*.**
- **Reduced infection rate from 1.4% to 0% by soaking graft on back table**
- **Additionally, we irrigate the graft and implants as we insert them – belt and suspender approach**

5. Avoiding Multiple Failures in the Athlete Think Kinematics of Anterior Tibial Translation

- Major players
  - ACL
  - Posterior capsule
  - Posterior horn medial meniscus
  - Posterior tibial slope – PTS
    - Traditionally measured off lateral X-Ray



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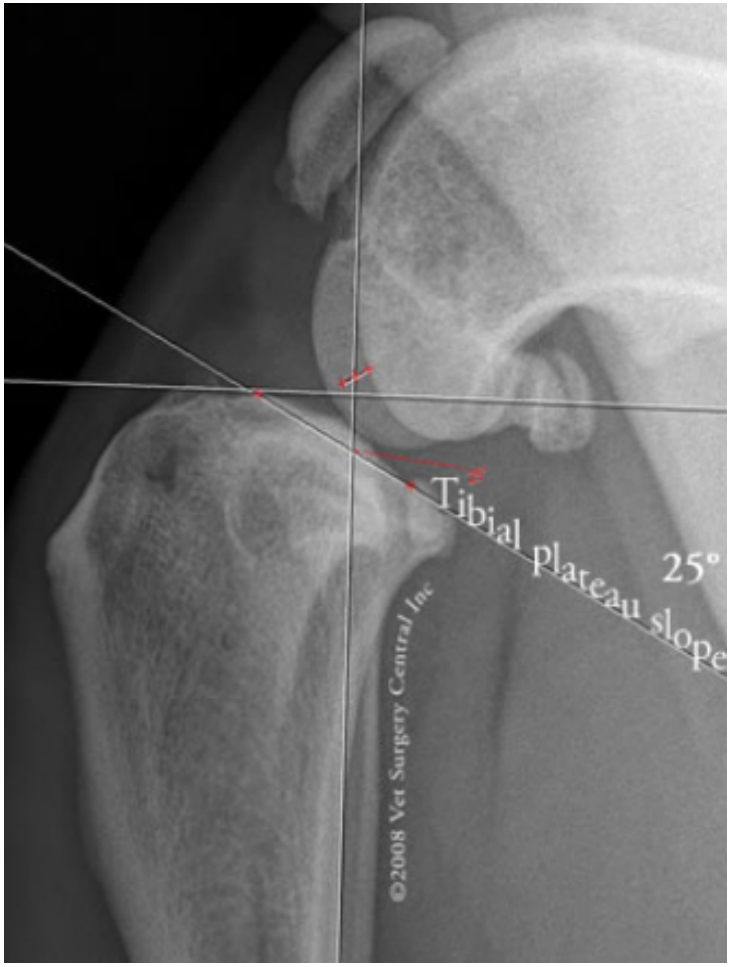
Historical Perspective

- Lyon group in France
- Henri DeJour and others
- Recognition of association of PTS and ACL injury (in humans)
- Our veterinarian colleagues were way ahead of us



Canine stifle joint

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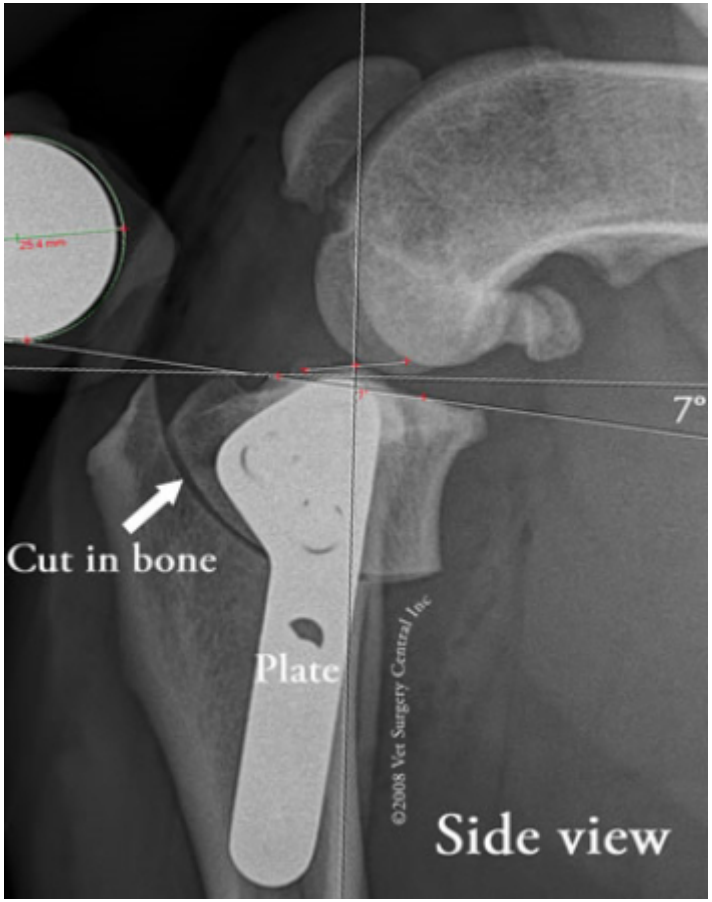
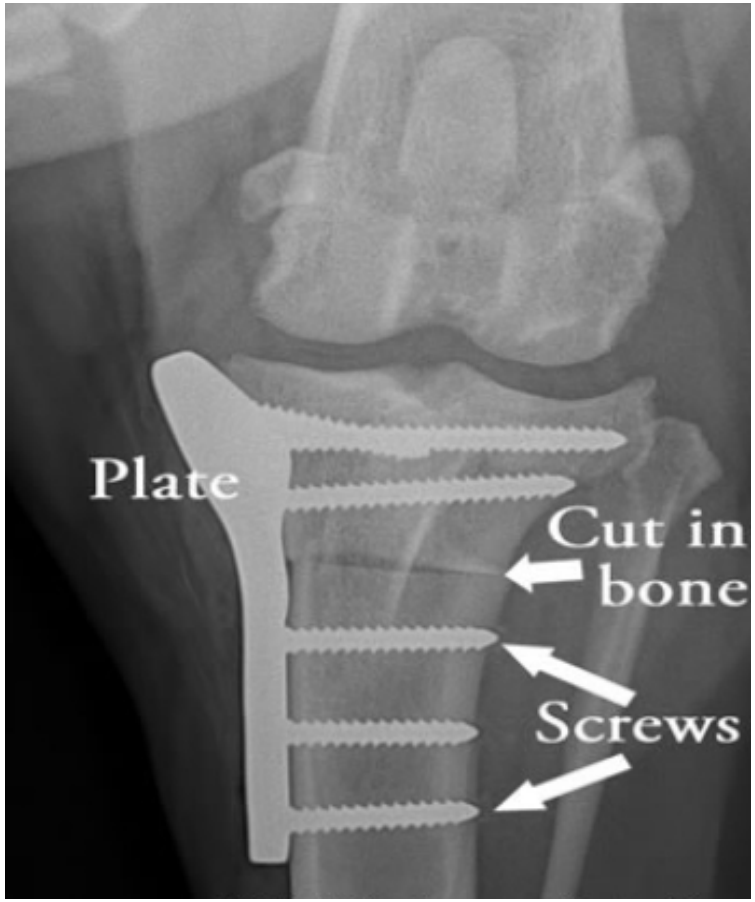
Tibial Plateau Leveling Osteotomy - TPLO





TPLO has replaced ligament reconstruction for canine ACL tears

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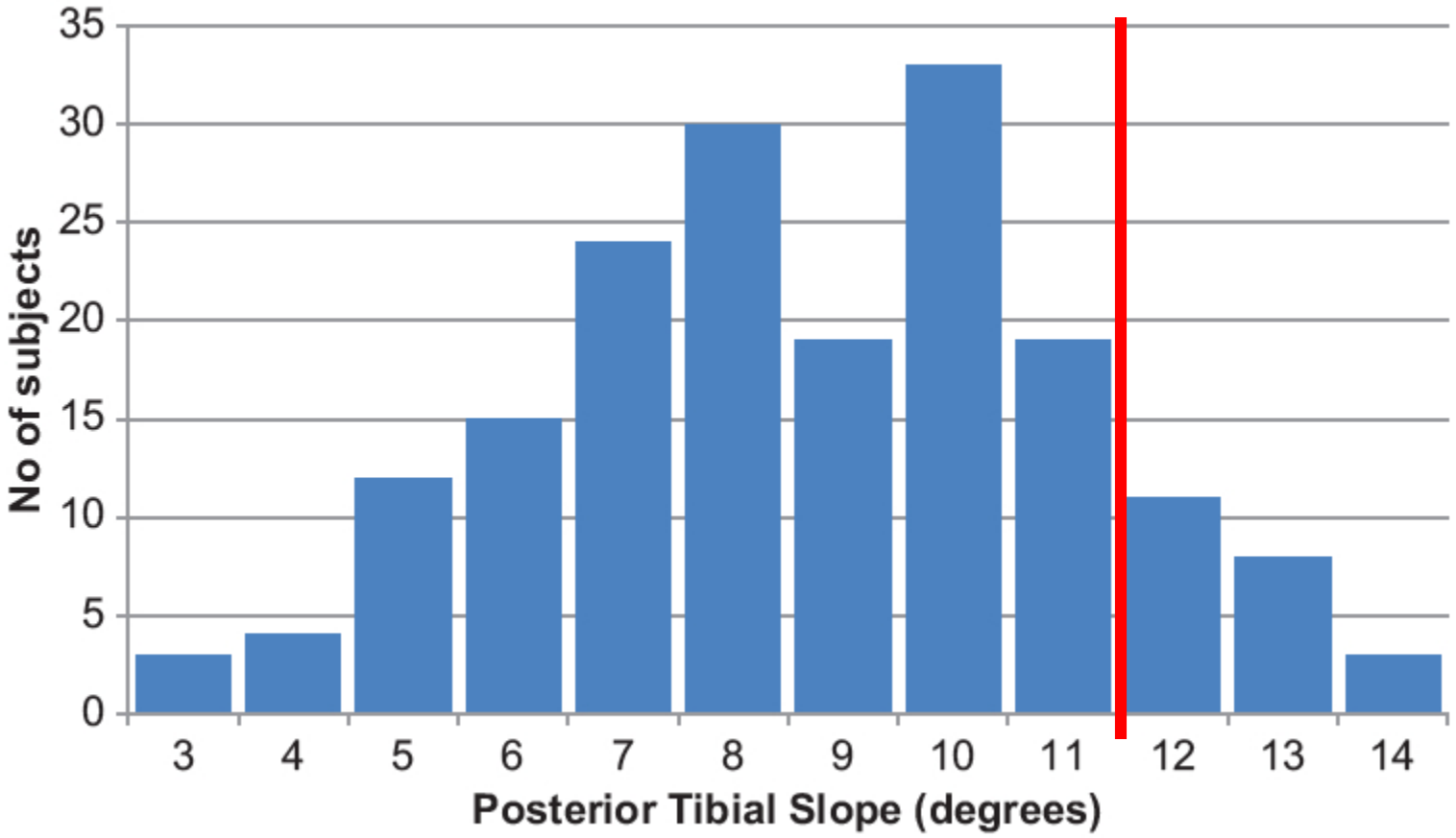
ACL Tibial Slope: Australian Cohort



Pinczewski et al: AJSM, 2013

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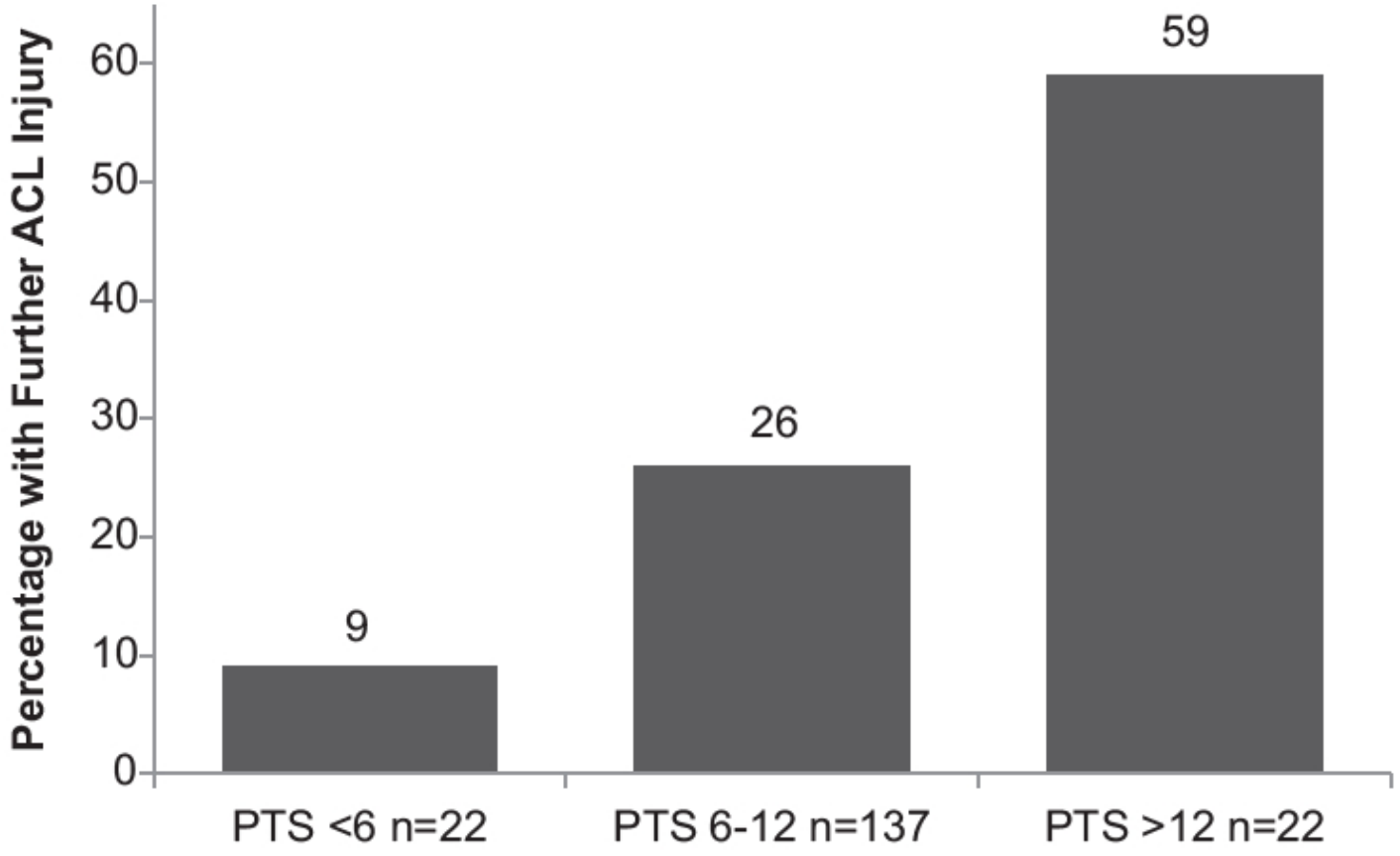
Further ACL Injury post ACL Reconstruction Ipsa- or Contra- Lateral



Pinczewski et al: AJSM, 2013

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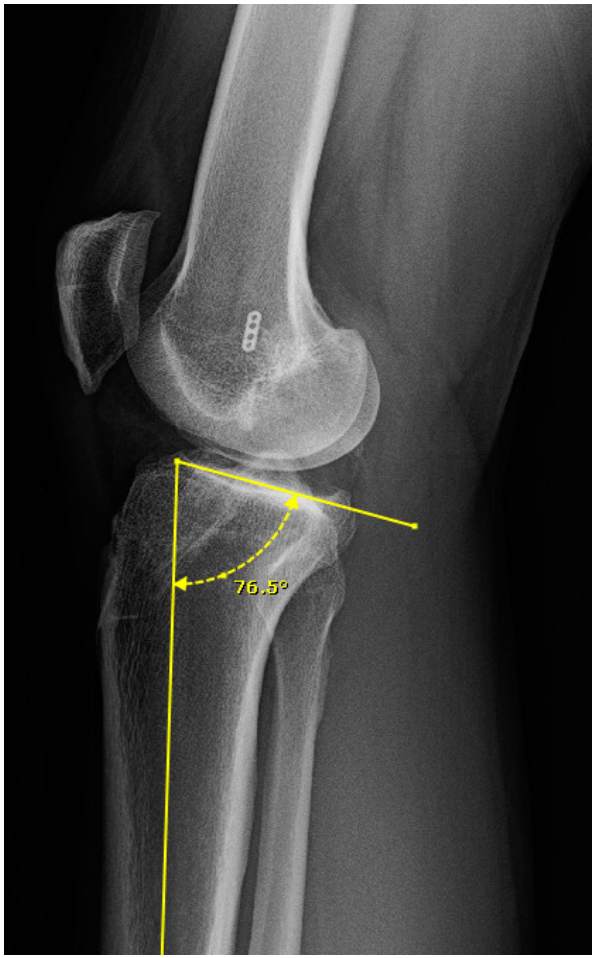
When Should we Consider Tibial Plateau Leveling Osteotomy - TPLO

- DeJour et al, 2015, KSSTA
  - Failed revision ACL surgery
  - PTS ≥ 12° (corrected to mean of 3°)
  - Single stage ACL – deflexion osteotomy
  - 90% > 2yr. f/u
  - 8/9 patients clinically stable

When Should we Consider Tibial Plateau Leveling Osteotomy - TPLO

- Active 25 yo failed 2 well done ACL's – hamstring auto- and B-PT-B auto-
- Posterior tibial slope = 14°
- Total medial meniscectomy



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When Should we Consider Tibial Plateau Leveling Osteotomy - TPLO

2nd stage will be B-PT-B + medial meniscal allograft

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Summary – Avoiding ACL Complications

1. Maintain meticulous graft harvest
2. Consider a shorter construct for hamstrings
3. Extension before, during, and after surgery
4. Soak and irrigate your graft in vancomycin
5. Remember the slope

Thank You

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