CLINICAL ASSESSMENT OF FAILED ACL RECONSTRUCTION

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OVERVIEW

- HISTORY
- CLINICAL EXAMINATION
- PRIMARY ACL SURGICAL TECHNIQUE

HISTORY

- Definite history of reinjury
  Subluxation event
  Effusion, painful to weightbear
  Easy diagnosis

- No history of injury
  Sense of instability
  Never felt able to trust the knee

History

- Time from injury to primary ACLR?
  Chronicity of the injury, Arthritic progression
- Was their meniscal or chondral or other ligamentous pathology?
  Was surgery required for this?
- Were there any complications in the primary procedure?
- Was the rehab program adhered too?
- Did the patient return to sport?
  If so when?

Clinical Examination

- ACL Ruptured ?
- ACL intact but lax - incompetent
- VERY important to assess alignment
- Range of motion
- Other ligaments - PCL, MCL,LCL, PLC and AL ligaments
- Meniscal and chondral pathology

ACL Examination

- Always compare to the contralateral limb
- Pivot shift test most important
- Lachmann second most important
- Anterior drawer

Lachmann – Big knee

Anterolateral structures

- Grade of the pivot shift test
  Grade III anterolateral structures damaged

- Anterior drawer test in neutral and internal rotation
  Internally rotating the tibia will tighten the anterolateral structures decreasing the anterior drawer
  If anterolateral structures are lax the anterior drawer will be the same

The Primary ACLR

- Graft choice
- Graft size
- Tunnel placement

GRAFT FAILURE OF TRANSTIBIAL VS TRANSPORTAL HAMSTRING ACL RECONSTRUCTION

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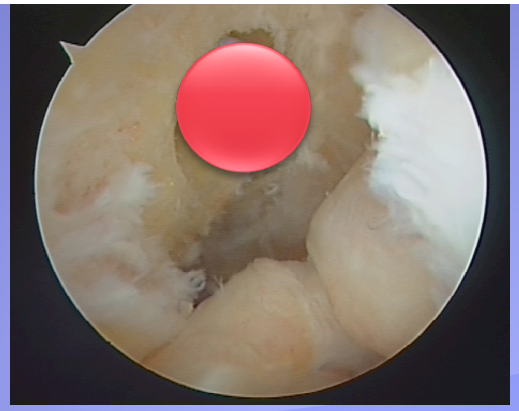
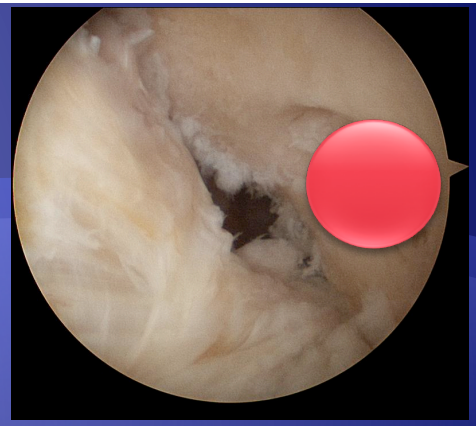
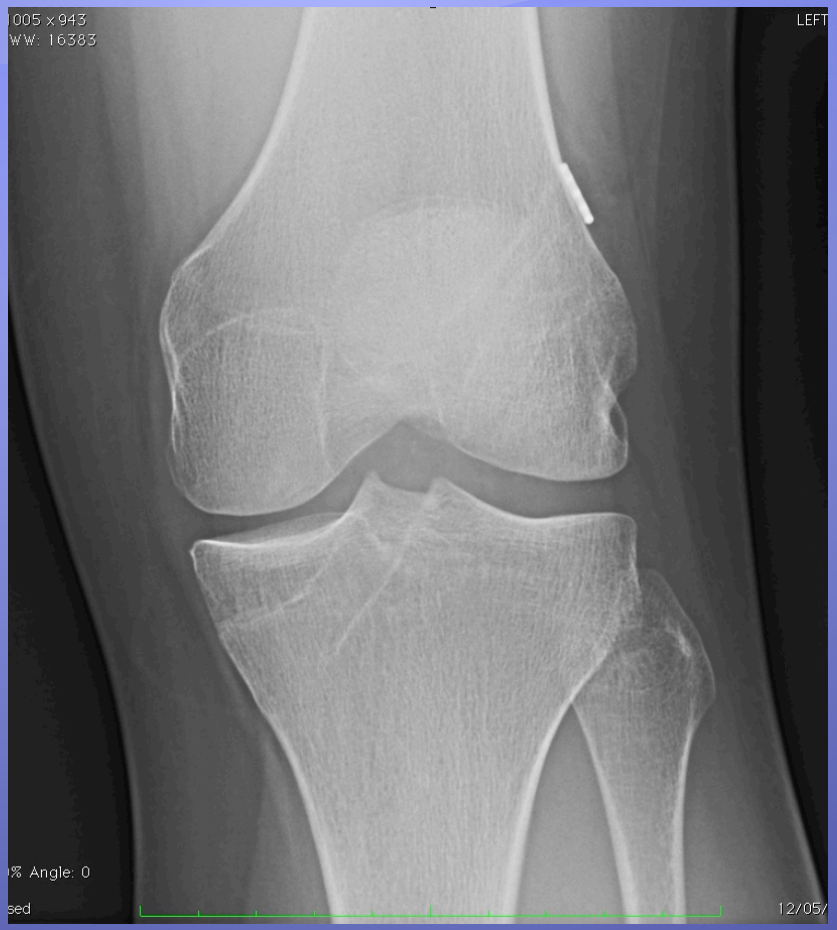


Study



- Prospective study - Private practice
- August 2000 - May 2009 – Hamstring transtibial ACLR – 1016 patients
- Transtibial technique – . Medial tibial incision - oblique shallow tibial tunnel. High AM femoral position still within the footprint.
- May 2009 – May 2013 – Hamstring Transportal ACLR - 464 patients
- Transportal ACLR technique - 30% distal (forward) off the back wall and lower (posterior),
  More anterior tibial tunnel – centromedial
- All patients had Endobutton/Retrobutton for femoral fixation and Intrafix/ GraftBolt for tibial fixation
- Failure - return to surgeon for revision, clinical failure with MRI and known revision by other surgeon - Will underestimate failure rate

TransTibial



TransPortal

Results

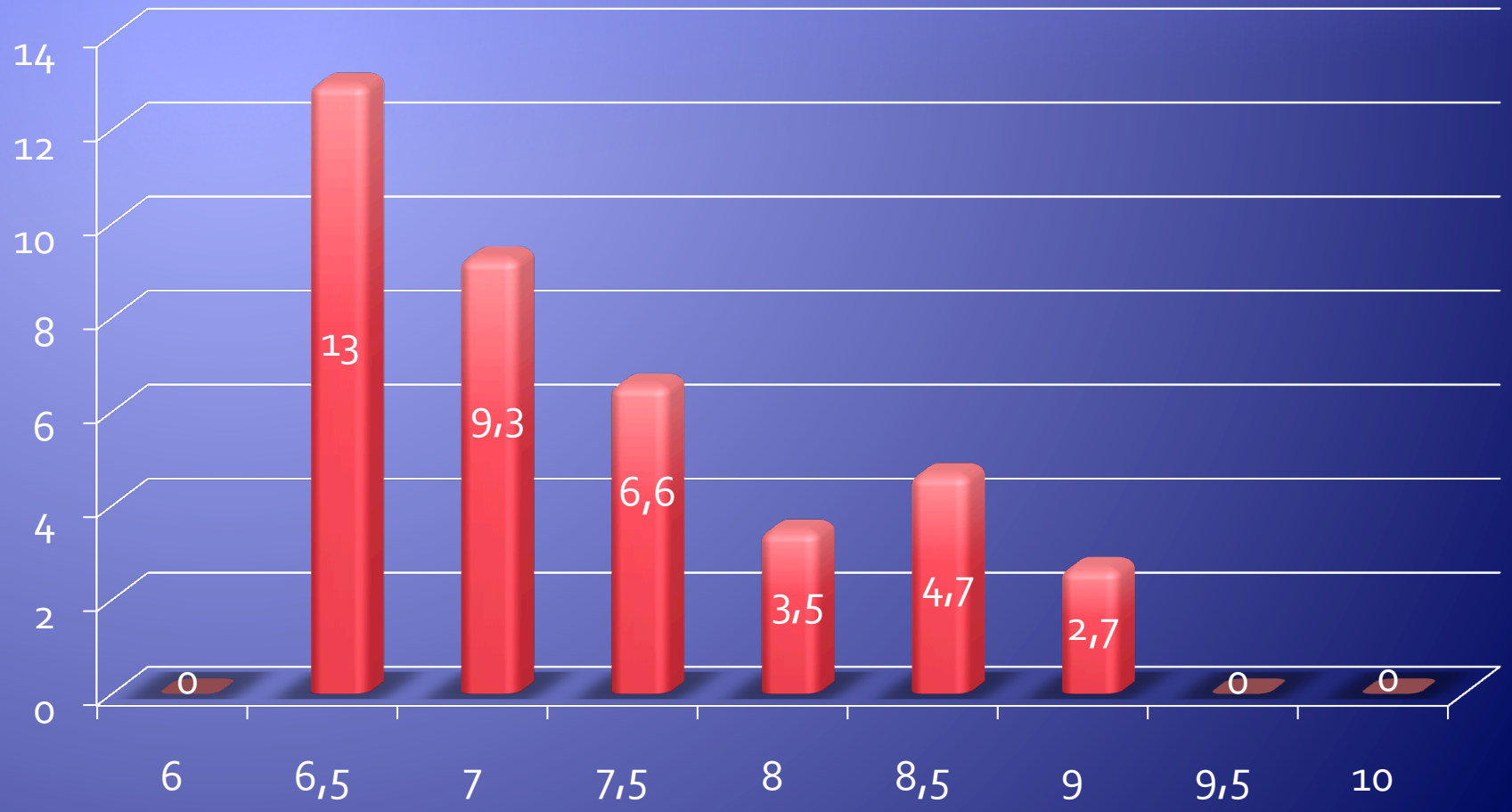
- 52 failures in 1016 TT ACLR followed for 6-15 years
  mean 8.9 years - 5.1% failure rate
- 31 failures in 464 TP ACLR followed for 2-6 years
  mean 4 years - 6.7% failure rate
- 13 failures in 419 TT ACLR followed for 2-6 years
  3.1% failure rate
  TP technique 2.2 X higher failure rate
- Hazard Ratio – more sophisticated evaluation that allows for variation in follow up
  The TP technique has a 2.4 X higher hazard ratio than the TT technique p=<0.001

Results - Multivariate Analysis

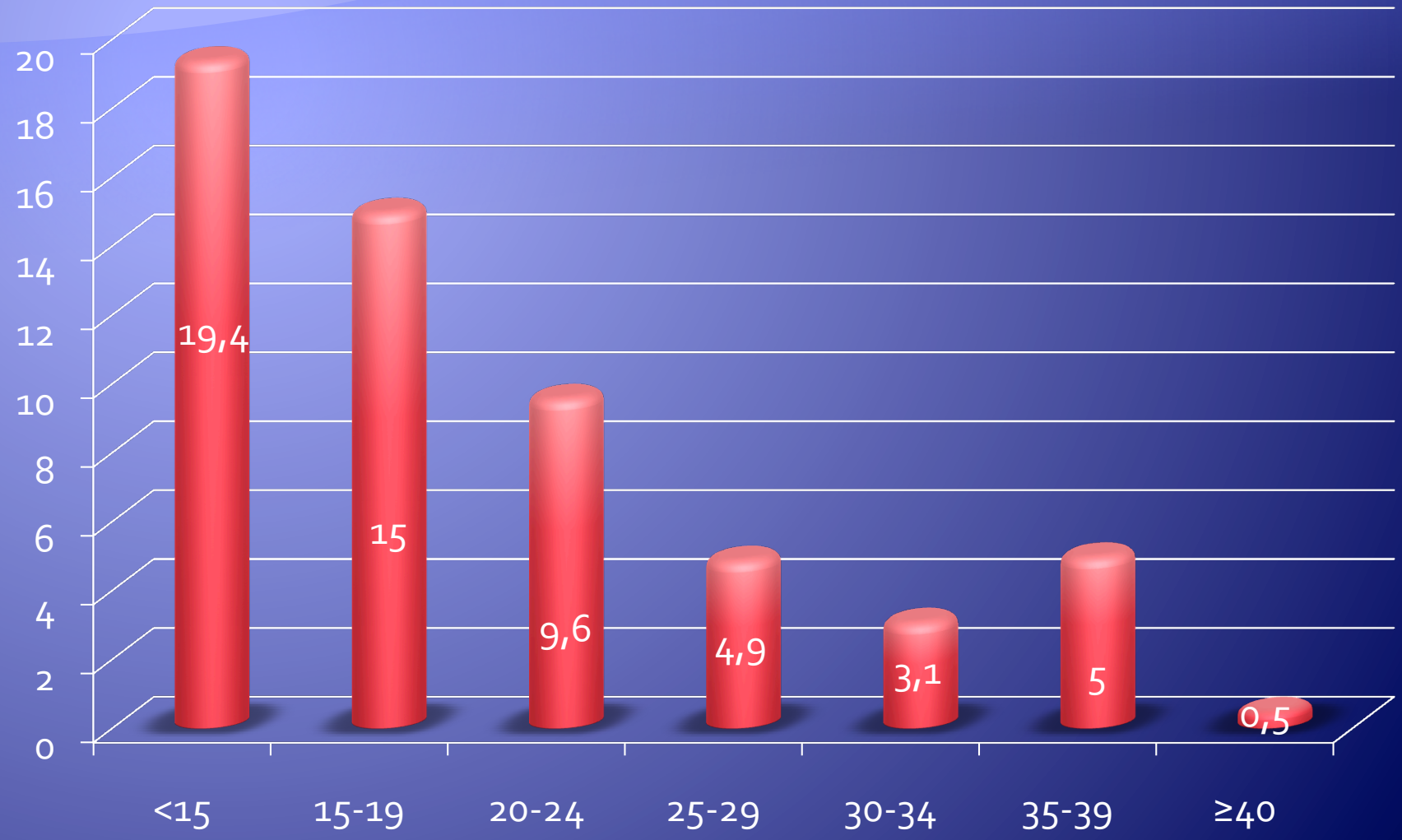
	Trans Tibial	Trans Portal	Significance
Age	32.1	32.3	N.S
Sex F/M	35/65	36/64	N.S
Graft Size	7.8	7.7	0.02
Time to Surgery	15.5	24.5	0.001
Medial Meniscal %	87.4%	91.3%	0.002
Lateral Meniscal %	93.6%	95.3%	0.028
Medial Meniscal Repair	24.1%	16.4%	<0.001
Lateral Meniscal Repair	7.2%	5%	N.S

The TP technique has a 2 .3X higher hazard ratio than the TT technique when all factors are taken into account p=0.001

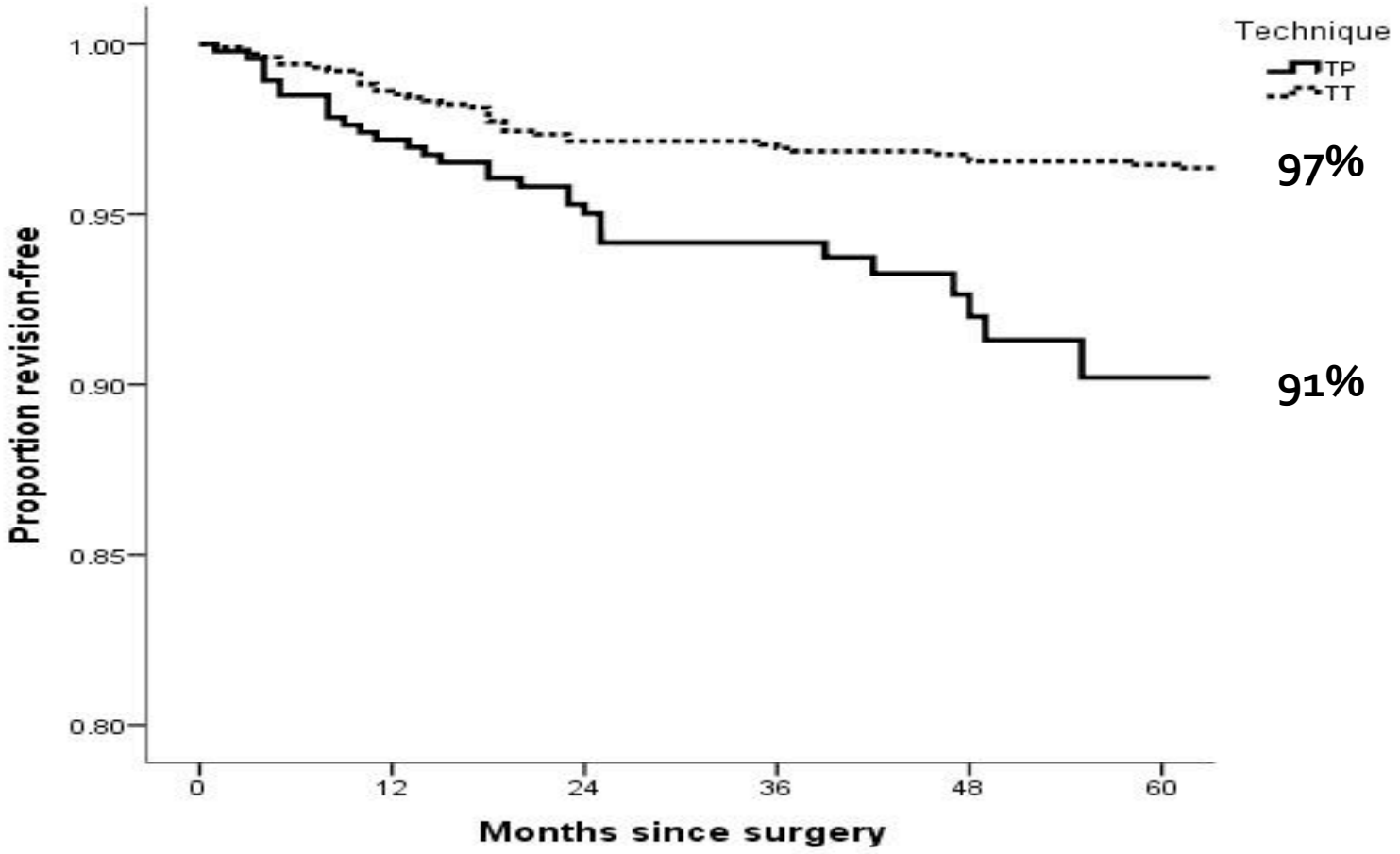
Graft Diameter Failure Rate



Age Band Failure Rate



Survival Analysis



TP 0.14 failures / 100 graft years 3.5 x higher failure

TT 0.04 failures / 100 graft years p=<0.001

Time to Failure

- 61% of TP ACLR's failed < 1 year post surgery
- 27% of TT ACLR's failed < 1 year post surgery p=<0.0001
- Mean time to failure within 6 years TP 12.2 months, TT 29.2 months p =0.02

TP AM femur Centromedial Tibia

- Changed in May 2013 to AM femoral tunnel, continued with transportal, maintained centromedial tibia.
  Increased BPB ACLR's
- TP AM femur - 268 hamstring patients
  4 failures - 1.5% ruptured within two years
- BPB AM femoral footprint – 55 patients
  No failures
- First 2 years TP central femoral footprint 238 patients.
  9 graft failures – 3.8% ruptured within 2 years
- First 2 years TT AM femoral footprint, posterior tibial tunnel
  171 patients – 3 graft failures - 1.8% ruptured within 2 years

Summary

- The TP technique has a 2.3 x higher hazard ratio for failure than the TT technique with a multi-variate analysis p=0.002
- The TP technique has a 3.5 X higher failure rate when utilising failures / 100 graft years
- TP ACLR's failure have a higher earlier failure rate
  -61% vs 27%
  < 1 year post surgery p=0.001
- Moving the femoral tunnel back to a high AM position has resulted in a 2.5 X lower failure rate
- Placement of the ACL graft in an more central footprint position results in a higher failure rate and an earlier failure than placement in a high AM position

Consideration factors for ACL placement

- More forward (distal) and lower (posterior) femoral graft placement does not replicate the direct insertion of the ACL which is the lateral intercondylar ridge
  This results in an anisometric graft with higher strain through the graft
- This is the likely explanation for the increased failure rate of "Central Footprint ACLR"
- 80% of the functional ACL fibers arise from the AM bundle. The AM bundle is more isometric