

Outcomes of Single Stage Combined Anterior Closing Wedge Proximal Tibial Osteotomy, Bone-Patellar Tendon-Bone Revision ACLR and a Modified Lemaire Procedure in Patients with Increased Posterior Tibial Slope

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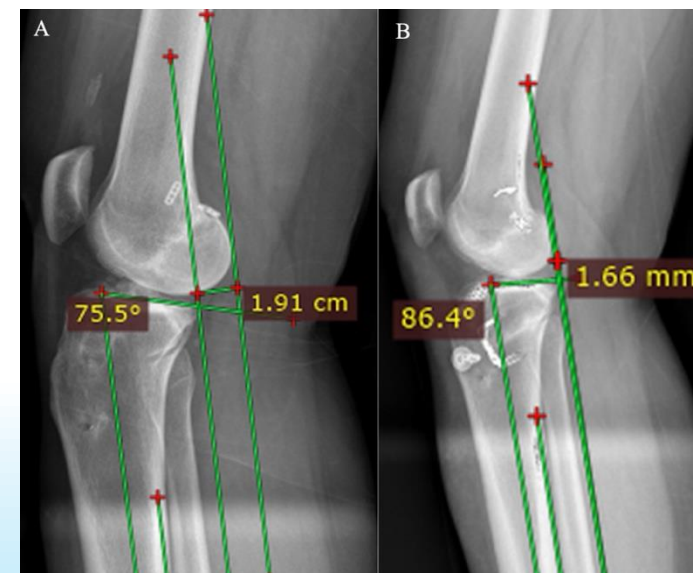
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Faculty disclosures



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Company affiliations:

Dr. Fritz, Dr. Getgood, Dr. LaPrade, Dr. Brown – Smith and Nephew Inc

Dr. Getgood – Kyniska Robotics, Personalized Surgery, Precision OS, Spring Loaded Technology Inc

Dr. Parratte – Zimmer Biomet Inc, NewClip Technics

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ACL reconstruction failure rates 7-20%

Risk factor:
Increased posterior tibial slope (PTS)

Risk factor:
High grade anteriolateral laxity (Pivot shift 2-3)

Increased anterior tibial translation (ATT)

Increased risk of ACLR graft failure



- **In patients with failed ACLR, increased PTS and high grade Pivot shift focus is to reduce risk of second failure**
- **BPTB** autograft has lowest failure rate
- Anterior closing wedge high tibial osteotomy (**ACWHTO**) can reduce PTS and ATT and thereby failure rate
- High grade pivot shift – **LET** can reduce failure rate
- **Single stage** surgery reduces patient and healthcare costs compared to two-stage surgery

Purpose

To evaluate the outcomes and safety of patients undergoing

- **Single stage revision ACLR**
- **BPTB autograft**
- **ACWHTO**
- **LET**



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Method – Design

Retrospective multi-surgeon, single center study

Revision ACLR with BPTB autograft, ACWHTO and LET from 2018 to 2023

Inclusion: >18yo, failed ACLR, PTS >15°, Pivot shift 2-3,

Measurements

Radiographs - Single leg monopodal stance view, lateral

PTS - Anatomical axis, mean

ATT - Using posterior tibial cortex line, medial compartment

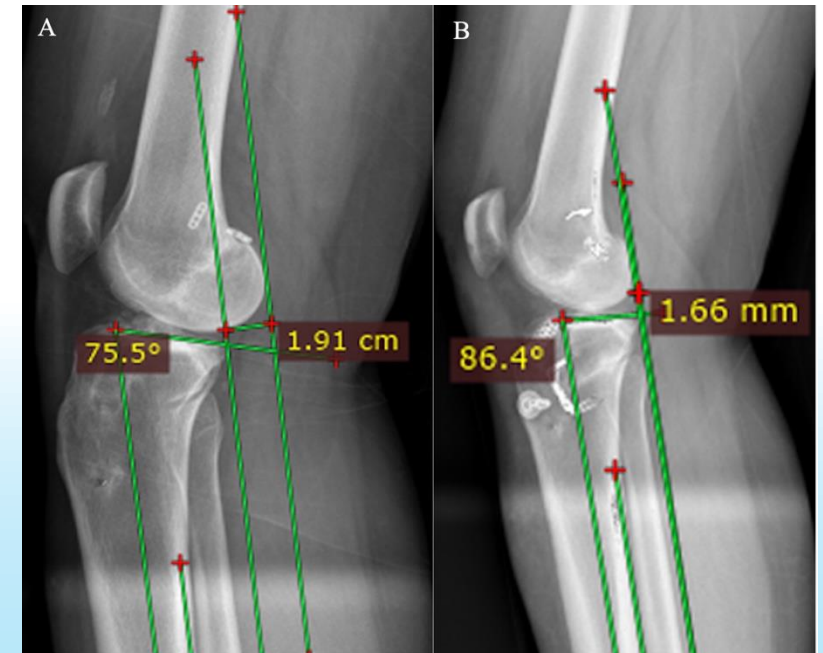
Clinical outcomes

Lachman

Anterior drawer

Pivot shift

IKDC score



Method – Surgical Technique



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ACWHTO

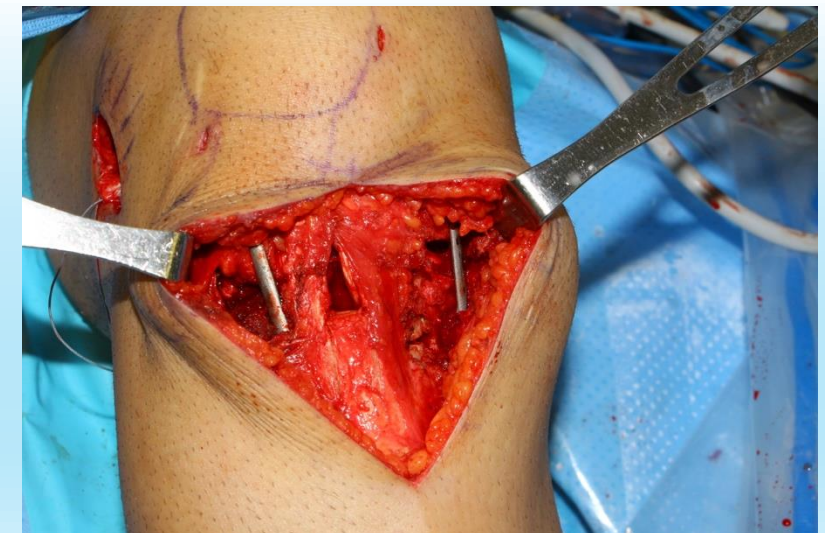
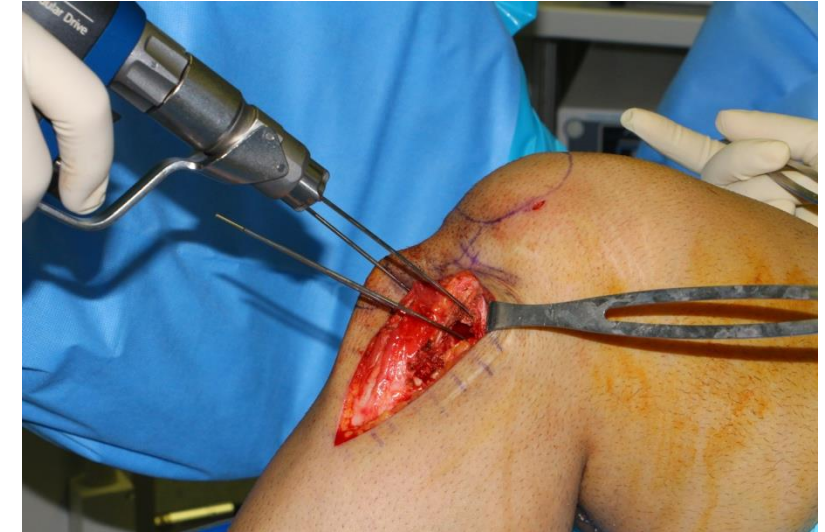
Anteromedial incision
Supratuberosity technique
Fixed with 2-3 staples in extension

BPTB

Harvest through same incision
Closing of both the tendon defect and the parathenon
Drilled outside-in on femur and tibia
Fixed with metal interference screws in 20° flexion

LET

Modified Lemaire with 10mm ITB-strip
Fixed with staple in 60° flexion

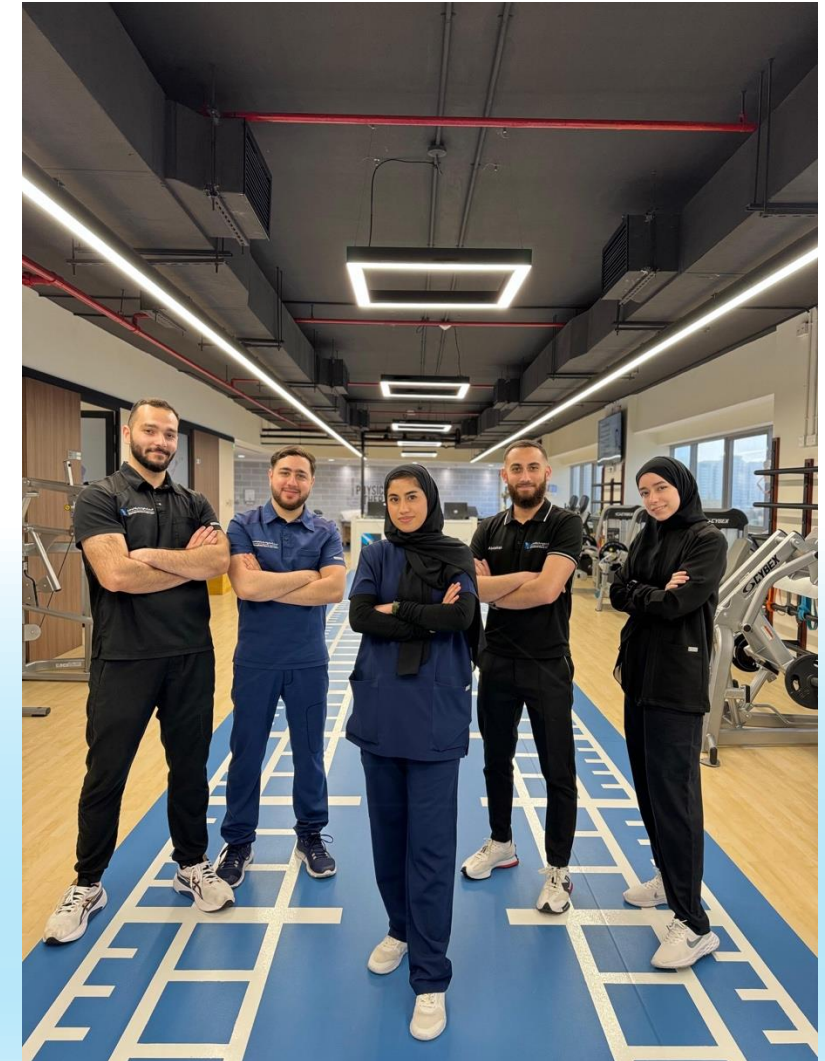


Method – Postoperative Rehabilitation

Weightbearing	0-4w Flat foot touch
	4-6w 25-50% bodyweight
	6-8w 50-75% bodyweight
	>8w Full weightbearing
Range of motion	0-4w 0-90°
	4-6w 0-120°
	6-8w 0-135°
	>8w Full ROM
Hyperextension	Avoid during 0-3 months
Return to sport	After 9 months



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Results



9 patients 31 years mean age
31 months mean follow-up time

PTS Decreased by 7.5°
ATT Decreased by 8.3mm

Lachman From 2/3 to 0 in all patients
Anterior drawer From 1/2 to 0 in all patients
Pivot shift From 2/3 to 0 in all patients

IKDC score 79.4 postoperatively

Table 2. Radiographic measurements of posterior tibial slope (PTS) and anterior tibial translation (ATT) before (preop) and after (postop) surgery.							
	PTS (°)		ATT (mm)		Side to side ATT difference (mm)		
Patient	Preop	Postop	Preop	Postop	Preop	Postop	
1	15.1	7.3	18.0	11.0	8.5	2.0	
2	16.3	7.5	17.5	5.1	6.8	-5.2	
3	17.6	9.3	10.7	1.5	2.9	-5.4	
4	16.7	9.0	13.8	8.0	7.8	3.1	
5	15.7	7.4	19.0	6.3	4.8	-7.7	
6	15.2	5.0	18.1	1.3	8.8	-7.6	
7	17.6	11.9	9.3	3.5	1.6	-7.1	
8	18.9	11.9	14.3	8.9	5.4	0.5	
9	18.5	14.7	11.3	11.5	3.0	0.0	

Conclusion

Single stage revision ACLR using:

BPTB autograft

LET

ACWHTO

in an ACL deficient knee with
high-grade pivot shift and increased posterior tibial slope
was a **safe** and **reliable** procedure with **improved clinical outcomes**.



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