ISAKOS CONGRESS 2025 | MUNICH GERMANY June 8–11

Survivorship And Functional Outcomes Of Anterior Cruciate Ligament Reconstruction With Internal Brace Augmentation- A Prospective Study

Prof (Dr.) Prateek Kumar Gupta, *M.Ch(U.K), FICS (USA), FRCS, INDIA*
Dr Ashis Acharya MS, INDIA
Dr Ekanki Bansal MS, INDIA
Dr Pratyaksh Kumar Gupta MBBS, INDIA

SPORTS MEDICINE UNIT
DEPARTMENT OF ORTHOPAEDICS
GANGA RAM INSTITUTE FOR POST GRADUATE MEDICAL EDUCATION AND RESEARCH (G.R.I.P.M.E.R)
SIR GANGA RAM HOSPITAL, NEW DELHI

Background

- Anterior cruciate ligament reconstruction (ACLR) using hamstring autograft of ≤ 8mm diameter is known to be associated with poor outcomes, instability, and graft rupture
- Internal brace augmentation (IBA) is a relatively newer technique
- Studies for assessing the role of internal bracing in ACLR are few & with conflicting results
- Use of high strength suture tape shares the load of the graft which can help reduce re-tear rate and improve knee function during the early stages thereby improving the surgical outcome

- **There are no conflicts of interest and disclosures**

Aims and Objectives

- The study aims to assess the survivorship, functional and clinical outcomes in patients undergoing ACL reconstruction using hamstring autograft $\leq$ 8 mm, augmented with internal brace

- To document any foreign body reaction or any untoward outcome due to the presence of foreign material that could lead to failure of construct or joint damage

Methods

- Prospective observational study conducted at Sir Ganga Ram Hospital, New Delhi from Jan 2019 to Jan 2024
- Patients between 18 – 55 years who underwent ACL reconstruction were chosen as per the defined inclusion and exclusion criteria by the investigating team
- Assessments were done pre-operatively, 6 weeks, 3 months, 6 months, 1 year and 2 years post procedure with the help of clinical examination and functional recovery aids
- Assessment for any foreign body reaction, if present was also noted

Methods

Evaluation was done using:

Clinical Examination

- Swelling
- Joint line tenderness
- Redness
- Deformity
- Lachman test
- Anterior drawer test
- Pivot test

Objective Functional Assessment

- Single leg hop
- Triple leg hop
- Triple cross over hop
- Drop jump test

Pain Assessment

VAS

Radiological Imaging

X-ray & MRI

Functional Recovery

International Knee Documentation Committee (IKDC)

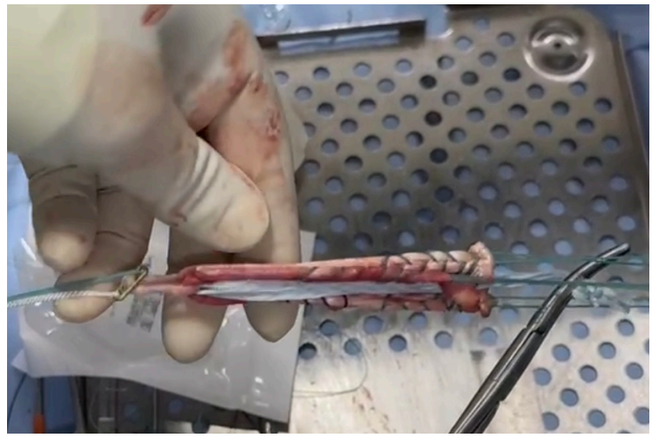
Lysholm Score (LS)

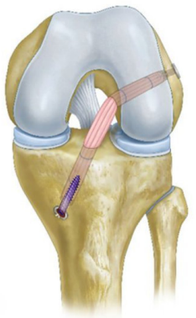
Tegner Activity Score (TAS)

Procedure

ACL reconstruction with internal bracing

Quadrupled hamstring autograft along with the fiber tape was passed through the closed loop of the endo button and both were stitched together using vicryl suture

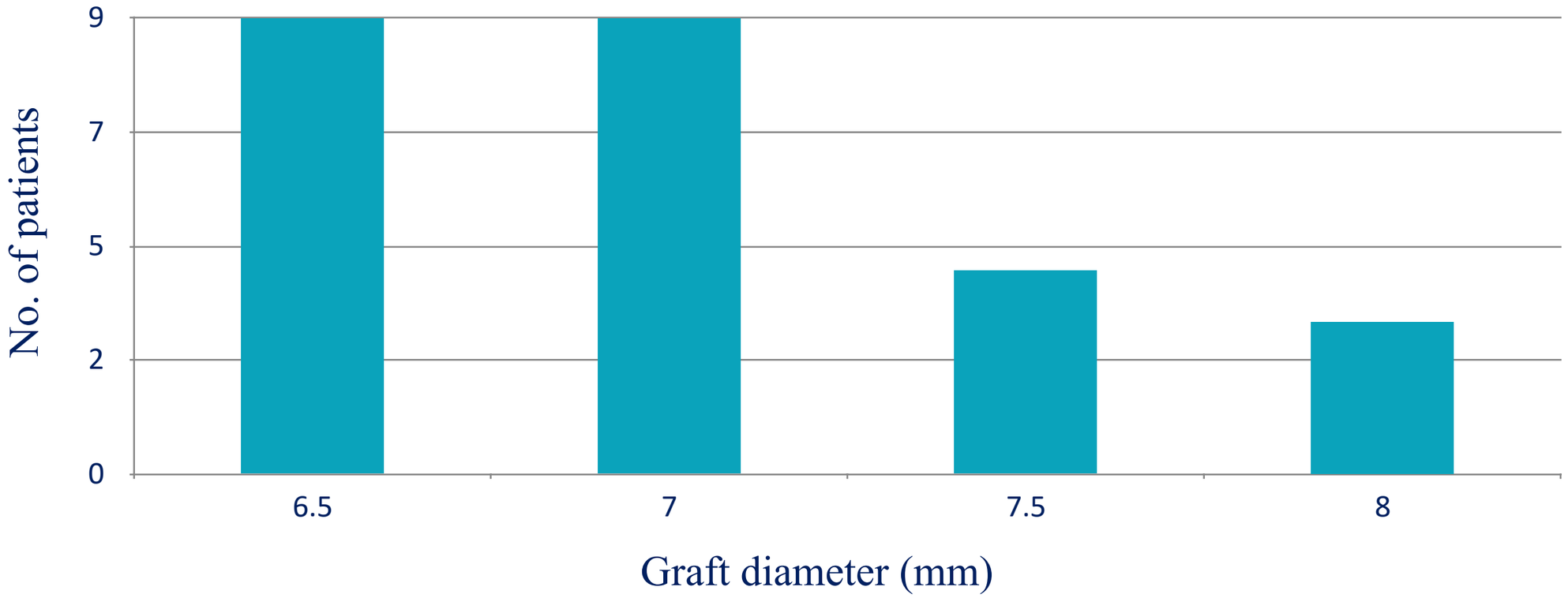




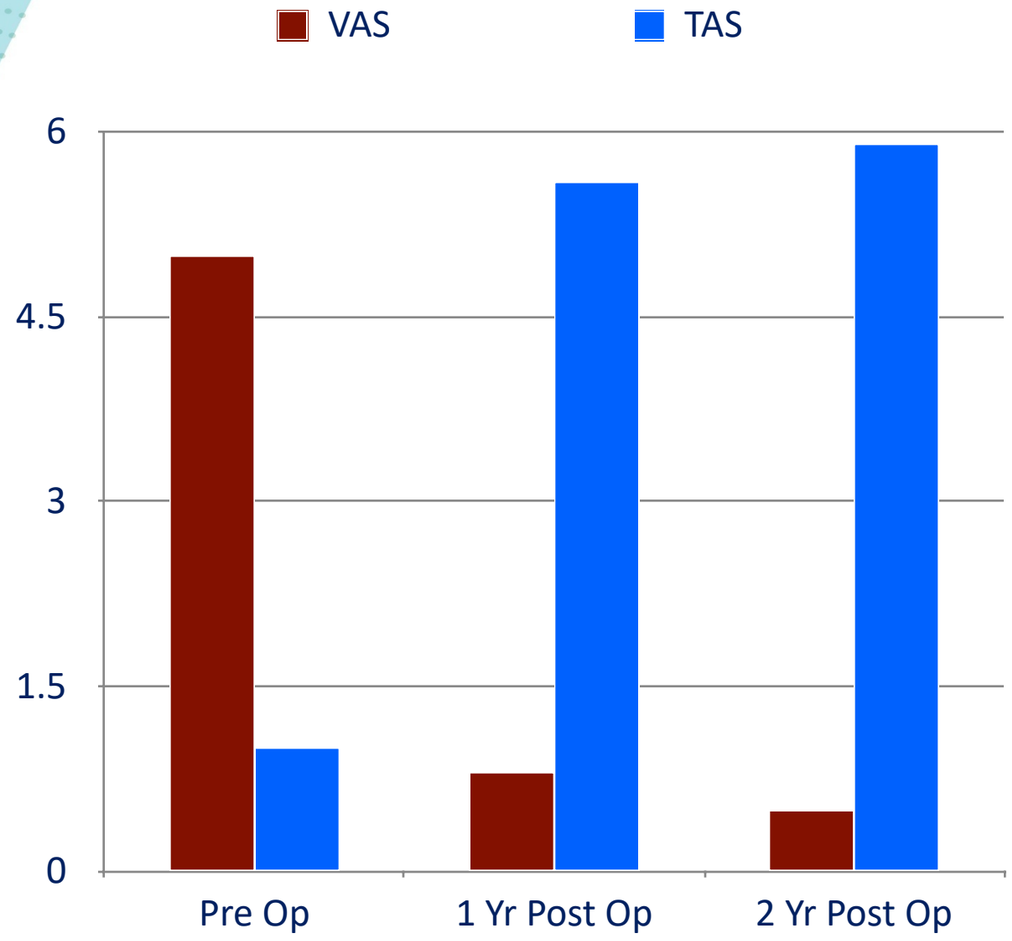
The endo button was fixed on the femoral side while the graft with the fiber tape was tensioned together and fixed on the tibial side with the bio-screw

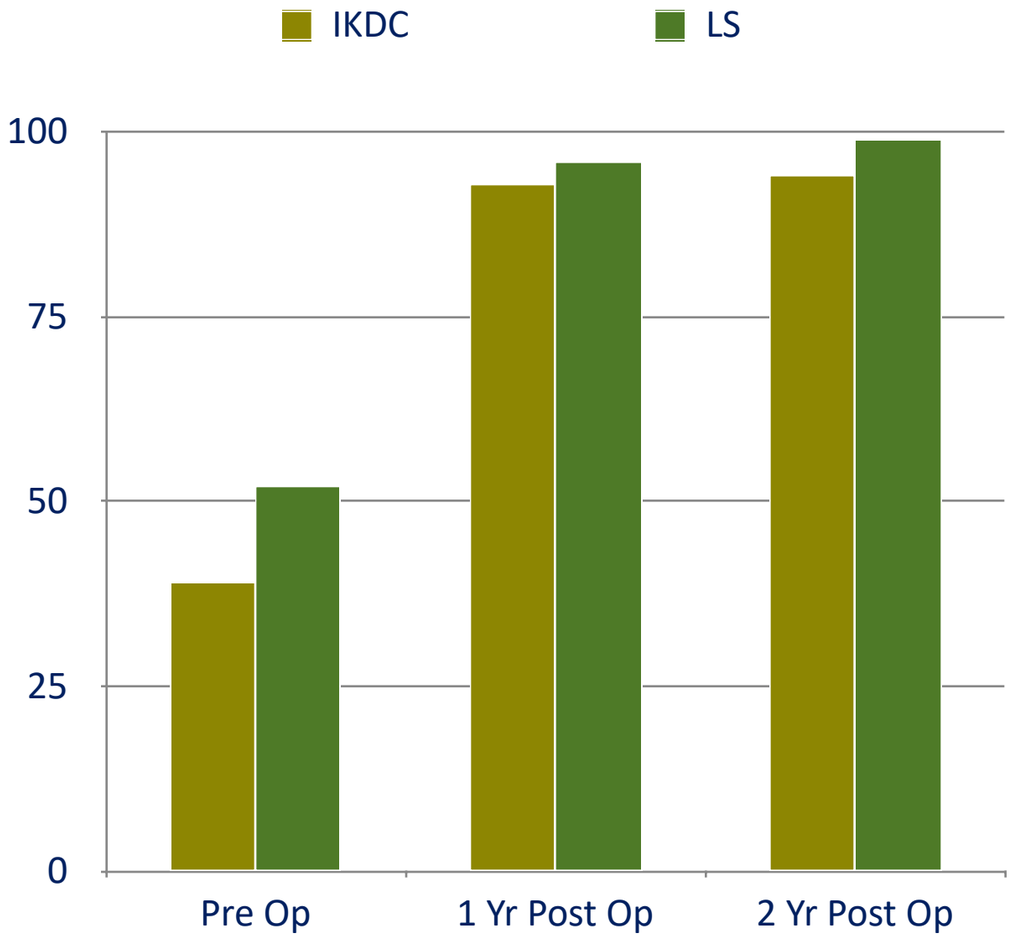
Results

Twenty five patients underwent ACLR with IBA from Jan 2019 to Jan 2024
The average time between injury and surgery was 2.5 months



Results





ISAKOS CONGRESS 2025 | MUNICH GERMANY June 8–11

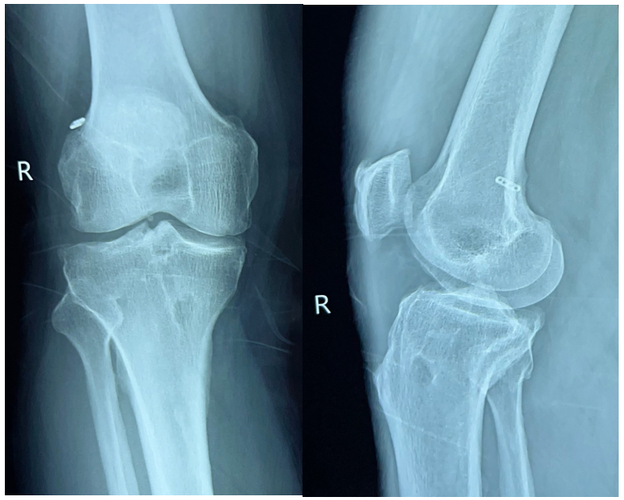
Patient Reported Outcomes

	No. Of Patients	VAS (0-10)	IKDC (0-100)	LS (0-100)	TAS (0-10)	p-value
Pre-operative	25	5 ± 2	39 ± 11	52 ± 18	1 ± 1	<0.001
1-year post-op	20	0.8 ± 0.6	93 ± 4.5	96 ± 3.7	5.6 ± 1	>0.05
2-year post-op	13	0.5 ± 0.5	94 ± 4	99 ± 2	5.9 ± 1	
5-year post-op	1	0	94	100	5	

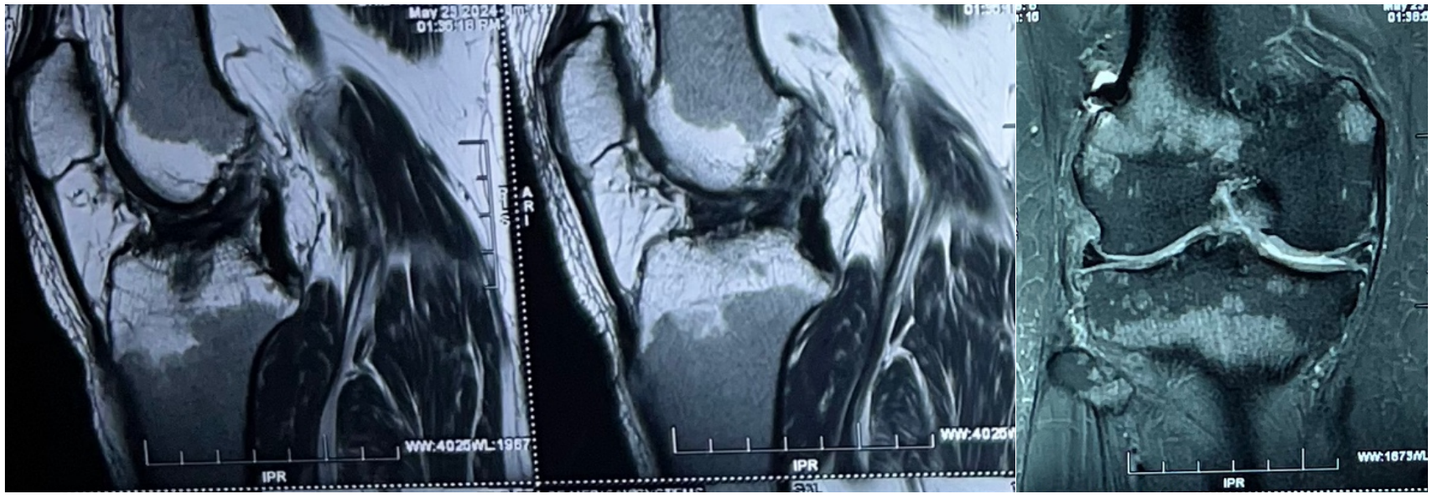
- Of the 25 patients in the study, 20 completed one year and 13 patients completed their second year follow up assessment by Jan 2024, with negative clinical signs and objective functional tests
- Five-year follow up has been completed by one patient with negative functional test

Patient Reported Outcomes

- Annual radiological assessment showed intact graft with no foreign body reaction



X-ray at 5 year follow-up



MRI at 5 year follow-up

- One patient underwent revision surgery due to infection after 6 months
- No other patient reported any untoward incident

ISAKOS CONGRESS 2025 | MUNICH GERMANY June 8–11

Conclusion

- ACLR with IBA demonstrates good outcome with return to pre-injury activity with no re-rupture, foreign body reaction or untoward side effect to the knee joint on clinical, functional and radiological evaluation at all follow-ups
- The technique may have its utility as a bailout solution when faced with ≤ 8mm hamstring graft diameter

References

- Pardiwala DN, Lee D. Arthroscopic biological internal bracing with remnant repair for subacute ACL femoral avulsions. J ISAKOS. 2023 Feb;8(1):54-6
- Wilson WT, Hopper GP, Banger MS, Blyth MJG, Riches PE, MacKay GM. Anterior cruciate ligament repair with internal brace augmentation: A systematic review. Knee. 2022 Mar;35:192-200
- Anderson SR, Youssefzadeh KA, Limpisvasti O. Anterior Cruciate Ligament Reconstruction With Suture Tape Augmentation: A Surgical Technique. Arthrosc Tech. 2019 Nov 28;8(12):e1579-82
- Daggett M, Redler A, Witte K. Anterior Cruciate Ligament Reconstruction With Suture Tape Augmentation. Arthrosc Tech. 2018 Mar 26;7(4):e385-9
- Barnaś M, Kentel M, Morasiewicz P, Witkowski J, Reichert P. Clinical assessment and comparison of ACL reconstruction using synthetic graft (Neoligaments versus FiberTape). Adv Clin Exp Med. 2021;30(5):491–8

THANK YOU

ISAKOS CONGRESS 2025 | MUNICH GERMANY June 8–11 | SGRH