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Original Research Article

Arthroscopic anterior cruciate ligament reconstruction with meniscal repair: single-sitting versus multiple-staged-functional outcome analysis

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ABSTRACT

Background: Anterior cruciate ligament (ACL) injuries are frequently associated with meniscal tears. Management can be performed either as a single sitting procedure (ACL reconstruction with concomitant meniscal repair) or in staged operations. The optimal strategy regarding functional recovery remains debated. The purpose of this study was to compare functional outcomes of single sitting versus multiple sitting arthroscopic ACL reconstruction with meniscal repair using peroneus longus tendon (PLT) autograft.
Methods: A prospective comparative study was conducted on 30 patients aged 18–50 years with ACL rupture and repairable meniscal tears, treated between November 2023 and November 2025. Patients were divided into two groups: group A (n=15) underwent single sitting ACL reconstruction with meniscal repair, and group B (n=15) underwent staged procedures. Functional outcomes were assessed using the International Knee Documentation Committee (IKDC) score and Lysholm score at baseline and at 12 months.
Results: All patients completed a minimum follow-up of 12 months. Both groups showed significant improvement from baseline. IKDC: 84.8±6.4 (group A) versus 82.1±6.8 (group B), p=0.21. Lysholm: 89.4±5.2 (group A) versus 86.7±5.6 (group B), p=0.19. Median time to return to sport was 7 months in group A and 9 months in group B. No graft re-ruptures were reported. Meniscal healing failure occurred in 1 patient (6.7%) in group A and 2 patients (13.3%) in group B.
Conclusion: Single sitting arthroscopic ACL reconstruction with meniscal repair using peroneus longus tendon autograft provides functional outcomes comparable to multiple sitting procedures, with the added advantage of earlier return to sport. It is a safe and effective option in appropriately selected patients.

Keywords: Anterior cruciate ligament, Peroneus longus tendon, Lysholm

INTRODUCTION

Anterior cruciate ligament (ACL) rupture is one of the most frequent knee injuries encountered in young and athletic populations. Up to 50% of ACL tears are associated with concomitant meniscal injuries. The menisci are vital for absorbing shock, maintaining joint stability, and evenly distributing load; therefore, their preservation is crucial for long-term joint health. Surgical management aims to restore knee kinematics, reduce instability, and prevent degenerative changes.

In the last decade, attention has shifted toward performing ACL reconstruction and meniscal repair in a single sitting. Advocates of this approach cite reduced surgical morbidity, faster rehabilitation, and better patient compliance. However, others prefer staged operations to minimize arthrofibrosis and allow better meniscal healing before ACL reconstruction. The use of peroneus longus tendon (PLT) autograft has gained attention as a strong and reliable alternative to the traditional hamstring graft, offering similar strength with minimal donor site morbidity.[1,2]

The purpose of this study was to compare the functional outcomes of single sitting versus multiple sitting arthroscopic ACL reconstruction with meniscal repair using peroneus longus tendon autograft.

METHODS

This was a prospective comparative study conducted at the Department of Orthopaedics, GSL Medical College and General Hospital, Rajahmundry, Andhra Pradesh, between November 2022 and November 2024. A total of 30 patients aged 18–50 years presenting with ACL rupture and repairable meniscal tears were included after obtaining institutional ethical clearance and informed consent.

Patients were divided into two groups- group A (n=15): single sitting arthroscopic ACL reconstruction with meniscal repair and group B (n=15): staged procedures with meniscal repair followed by ACL reconstruction after 8–12 weeks.

Inclusion criteria

Inclusion criteria were ACL rupture confirmed by magnetic resonance imaging (MRI) and arthroscopy with a repairable meniscal tear. Exclusion criteria included multi-ligamentous injuries, degenerative meniscal tears, prior ACL reconstruction, and severe osteoarthritis.

Surgical technique

All surgeries were performed under spinal anaesthesia with the patient in supine position and a tourniquet applied. Standard anterolateral and anteromedial arthroscopic portals were used. Diagnostic arthroscopy was performed to assess ACL and meniscal pathology. Meniscal repair was done using all-inside or inside-out techniques depending on tear configuration. The peroneus longus tendon was obtained through a small incision made just behind the lateral malleolus. The tendon was whip-stitched, quadrupled, and used as the graft for ACL reconstruction. The graft was fixed with an endobutton on the femoral side and an interference screw on the tibial side. Postoperative radiographs confirmed correct tunnel positioning.

Rehabilitation protocol

Early knee mobilization and quadriceps strengthening were started on postoperative day 1. Partial weight-bearing began at 2 weeks and full weight-bearing at 6 weeks. Return to running was allowed after 3 months and to sports after 6–9 months, depending on functional recovery.

Outcome measures

Functional outcomes were evaluated using the IKDC and Lysholm knee scores preoperatively and at 6 and 12 months postoperatively. Statistical analysis was performed using Student's t-test, with $p<0.05$ considered statistically significant.

RESULTS

All 30 patients completed a minimum of 12 months of follow-up. The mean age was 29.4 years (range 18– 50), with 80% males. Sports-related injuries accounted for 53% of cases, followed by road traffic accidents (30%) and falls (17%) (Table 1).

Both groups demonstrated significant improvement in functional scores from baseline to final follow-up. The mean IKDC score at 12 months was 84.8±6.4 in group A and 82.1±6.8 in group B (p=0.21). The mean Lysholm score was 89.4±5.2 in group A and 86.7±5.6 in group B (p=0.19).

Median return to sport was earlier in group A (7 months) compared to group B (9 months). Meniscal healing failure was observed in one patient (6.7%) in group A and two (13.3%) in group B. No graft re-ruptures were reported (Table 2).

Intraoperative steps of peroneus longus tendon harvest are shown in Figure 1.

Table 1: Age distribution of patients.

Parameter	Group A (single sitting)	Group B (staged)	P value
No. of patients	15	15	—
Mean age (years)	29.4±6.3	30.1±5.8	0.71
Sex (M/F)	12/3	12/3	—
Side (right/left)	9/6	8/7	—
Mechanism of injury	Sports: 53%	Sports: 47%	—

Table 2: Functional outcome scores.

Outcome measure	Group A (single sitting)	Group B (staged)	P value
IKDC (pre-op)	41.2±5.8	42.4±6.1	0.52
IKDC (12 months)	84.8±6.4	82.1±6.8	0.21
Lysholm (pre-op)	45.6±7.3	46.9±8.0	0.49
Lysholm (12 months)	89.4±5.2	86.7±5.6	0.19

Figure 2 shows arthroscopic views of torn ACL, meniscal tear, inside out meniscal repair and reconstructed ACL.

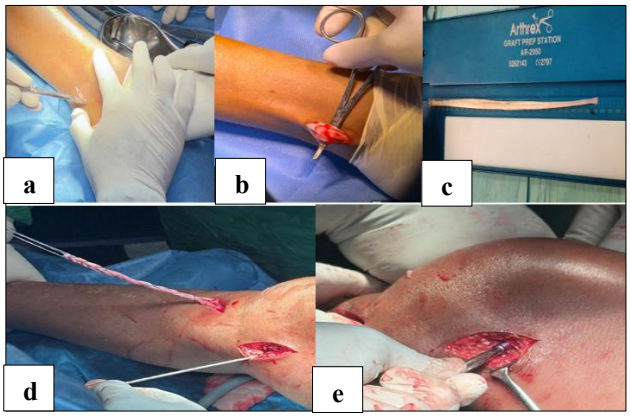

Figure 1: Intraoperative steps of peroneus longus tendon harvest: (a) incision posterior to lateral malleolus, (b) identification and isolation of peroneus longus tendon, (c) graft preparation, and (d) and (e) tunnel fixation using interference screw.

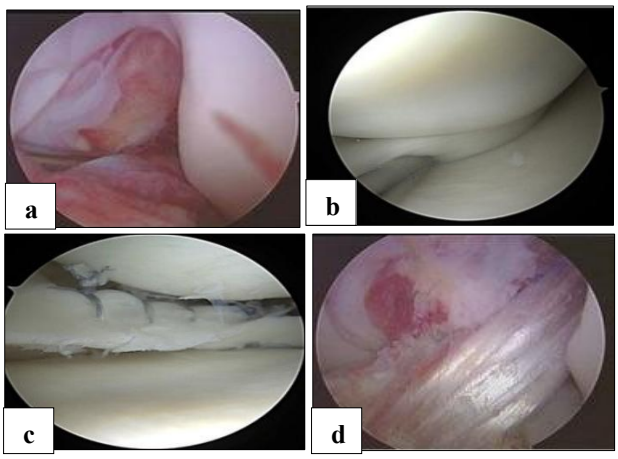

Figure 2: Arthroscopic views: (a) torn ACL, (b) meniscal tear, (c) inside out meniscal repair, and (d) reconstructed ACL.

Figure 3 shows IKDC functional outcome scores over time. Figure 4 shows Lysholm scores over time.

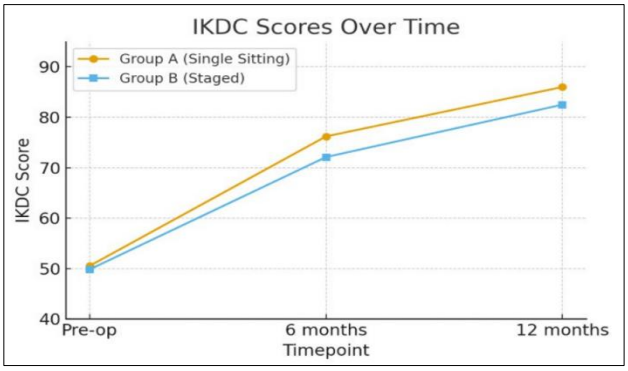

Figure 3: IKDC functional outcome scores over time.

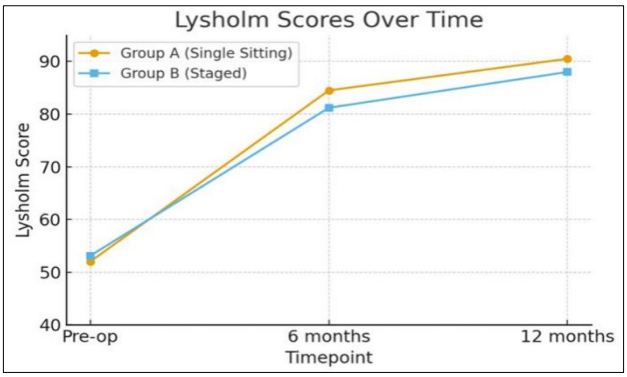

Figure 4: Lysholm scores over time.

DISCUSSION

The present study compared the clinical and functional outcomes of single-sitting versus multiple-staged arthroscopic ACL reconstruction with meniscal repair using the PLT autograft. Both groups achieved significant postoperative improvement in IKDC and Lysholm scores, with no statistically significant intergroup differences. However, patients in the single-sitting group demonstrated an earlier return to sporting activities, emphasizing the rehabilitation advantage of simultaneous reconstruction and repair.

In recent years, the peroneus longus tendon has gained attention as a viable alternative graft source to the hamstring and patellar tendons. Several studies have demonstrated that PLT autografts possess adequate tensile strength and favorable biomechanical properties comparable to the semitendinosus-gracilis complex.[1,7,8] Moreover, harvesting the peroneus longus has been shown to result in minimal donor-site morbidity and negligible impact on ankle stability or gait mechanics.[3,9,10] Khalid et al and Zhao et al reported that peroneus longus harvesting does not significantly affect ankle eversion strength, and patients retain normal walking ability, supporting the safety profile of this graft.[3,9]

The current findings are consistent with those of Gofer et al, who achieved excellent mid-term outcomes in one-stage ACL reconstruction using PLT autograft, and with Butt et al, who reported similar 5-year outcomes between PLT and hamstring autografts in a randomized controlled trial.[7,8] Our study further reinforces the clinical effectiveness of PLT in both single and staged procedures, making it an efficient and accessible graft option, especially when hamstring tendons are unsuitable or previously harvested.

Regarding the timing of meniscal repair, delayed intervention has been shown to compromise meniscal healing and long-term knee function. Sadoghi et al observed that postponing meniscal repair lowers the functional outcome following primary ACL reconstruction.[4] This supports the rationale for performing both procedures in a single sitting, which minimizes the

risk of meniscal extrusion, enhances vascularity, and allows for early mechanical stability that promotes meniscal healing. In the present study, meniscal healing failure occurred in only one patient in the single-sitting group compared to two in the staged group, consistent with this concept.

Peroneus longus graft use also offers advantages during revision or complex reconstructions. Gofer et al highlighted its role in one-stage revision ACL reconstruction with stable mid-term outcomes and minimal complications.[7] Furthermore, the systematic review in 2025 concluded that PLT harvest is associated with good ankle outcomes and low complication rates, reinforcing its safety in both primary and revision settings.[1]

The outcomes of our study are in agreement with previous Indian and international reports on ACL reconstruction and meniscal repair. Sudhakar et al demonstrated excellent functional outcomes following arthroscopic ACL reconstruction with autologous grafts, while Ashish et al reported favorable meniscal repair success rates using arthroscopic techniques.[5,6] Together, these studies underline that the success of ACL reconstruction is not only dependent on graft choice but also on the timing and quality of concomitant meniscal repair.

The principal advantage of a single-sitting procedure lies in reduced overall rehabilitation time, cost effectiveness, and avoidance of repeated anesthesia exposure. Our data reflect these benefits, as patients in the single-sitting group resumed sport nearly two months earlier on average than those in the staged group. Although the difference in functional scores between the two groups was not statistically significant, the earlier functional recovery has clear clinical and socioeconomic relevance.

Limitations

Limitations of this study include a relatively small sample size, short follow-up duration, and absence of radiological assessment of graft and meniscal healing. Future research with larger cohorts, longer follow-up, and inclusion of MRI-based healing evaluation is warranted to validate the long-term durability of these outcomes.

CONCLUSION

Single sitting arthroscopic ACL reconstruction with meniscal repair using peroneus longus tendon autograft yields functional outcomes comparable to staged procedures, with faster rehabilitation and earlier return to sports. It is a safe, effective, and economically favorable technique in appropriately selected patients.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Soleymanha M, Soleymani Nejad A, Keyhani S, Vosoughi F, LaPrade RF, Tollefson LV. Peroneus longus tendon harvest for ACL reconstruction yields good functional outcome of the ankle: A systematic review and meta-Analysis. Knee Surg Sports Traumatol Arthrosc. 2025;30.
2. Chen C, Jing Z, Li Z, Hu M, Bei C, Xin L. Comparative efficacy of different lengths of anterior cruciate ligament stump during reconstruction with peroneus longus tendon. BMC Surg. 2025;25(1):175.
3. Zhao Z, Tang L, Chen J, Bai X, Chen Y, Ng L, et al. The effect of harvesting the anterior half of the peroneus longus tendon on foot morphology and gait. J Orthop Surg Res. 2024;19(1):69.
4. Sadoghi P, Widhalm HK, Fischmeister MF, Leitner L, Leithner A, Fischerauer SF. Delayed Meniscus Repair Lowers the Functional Outcome of Primary ACL Reconstruction. J Clin Med. 2024;13(5):1325.
5. Sudhakar T, Raja CR, Jambukeswaran PST, Ugeneshwaran M, Jeyaraman M. Functional outcome of arthroscopic anterior cruciate ligament reconstruction with autologous graft. Indian J Orthop Surg. 2021;7(2):113-7.
6. Ashish S, Ravindra C, Aditya D, Ashish P. Outcome after arthroscopic meniscal repair. D Y Patil J Health Sci. 2024;12(3):91-7.
7. Gofer AS, Alekperov AA, Gurazhev MB, Avdeev AK, Lukinov VL, Rubtsov DV, et al. Peroneus longus tendon autograft for one-stage revision ACL reconstruction: midterm results. Trauma Orthopaed Russia. 2024;30(2):82-96.
8. Butt U, Vuletic F, Shaikh MAA, Amanullah, Rehman GU, Shah IA, et al. 5-years outcomes following arthroscopic anterior cruciate ligament reconstruction comparing quadruple hamstring and peroneus longus tendon autografts: a randomized control trial. Arch Orthop Trauma Surg. 2024;145(1):85.
9. Khalid MN, Janjua SN, Sheraz M, Kanwal S, Ghouri QM, Shaheen UU. Quantifying donor-site morbidity in anterior cruciate ligament reconstruction using peroneus longus tendon autograft. J Musculoskelet Surg Res. 2024;8:349-53.
10. Zhao Z, Tang L, Chen J, Bai X, Chen Y, Ng L, et al. The effect of harvesting the anterior half of the peroneus longus tendon on foot morphology and gait. J Orthop Surg Res. 2024;19(1):69.

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