


Evaluation of knee stability and functional outcome following ACL reconstruction with peroneus longus tendon autograft

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ABSTRACT

Background: Anterior cruciate ligament (ACL) injury is a common cause of knee instability leading to functional impairment. ACL reconstruction using peroneus longus tendon autograft has emerged as a promising option with satisfactory clinical outcomes. This study aimed to evaluate knee stability and functional outcome following ACL reconstruction using peroneus longus tendon autograft. **Methods & Materials:** This prospective observational study was conducted in the Department of Orthopaedics & Traumatology at Khwaja Yunus Ali Medical College & Hospital from December 2023 to May 2026 over 2.5 years. A total of 40 patients with ACL injury who underwent reconstruction using peroneus longus tendon autograft were included. Knee stability was assessed using Lachman, anterior drawer and pivot shift tests, while functional outcome was evaluated using the Lysholm Knee Scoring Scale. Data were analyzed using SPSS version 25. **Results:** The mean age of patients was 31.8 ± 8.6 years, with a male predominance (77.5%). Sports injury was the most common cause (40%). Postoperatively, significant improvement in knee stability was observed, with Lachman test positivity reduced from 97.5% to 10%, anterior drawer test from 92.5% to 12.5% and pivot shift test from 85% to 15%. Functional outcome improved markedly, with mean Lysholm score increasing from 58.6 ± 9.4 preoperatively to 91.3 ± 6.8 postoperatively. At six months, 82.5% of patients achieved good to excellent outcomes. **Conclusion:** ACL reconstruction using peroneus longus tendon autograft provides excellent improvement in knee stability and functional outcomes and may be a reliable graft option for ACL-

deficient patients.

Keywords: ACL reconstruction, peroneus longus tendon, knee stability, functional outcome, Lysholm score.

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INTRODUCTION

Anterior cruciate ligament (ACL) injury is one of the most common ligamentous injuries of the knee joint and is frequently encountered among young, active and sports-related populations [1]. It usually results from sudden twisting movements, rapid deceleration, pivoting, or trauma to the knee joint. ACL injury leads to knee instability, pain, recurrent giving way, reduced functional capacity and limitation of daily and athletic activities [2]. If left untreated, chronic instability may predispose patients to meniscal injury, cartilage degeneration and early osteoarthritis, significantly affecting quality of life [3].

ACL reconstruction has become the standard treatment for symptomatic ACL-deficient knees, especially in physically active individuals [4]. The primary goals of reconstruction are restoration of knee stability, improvement of functional outcome and prevention of secondary joint damage [5]. Various autografts have been used for ACL reconstruction, including bone-patellar tendon-bone graft, hamstring tendon graft and quadriceps tendon graft [6]. Although these grafts have shown satisfactory results, donor site morbidity, anterior knee pain, muscle weakness and graft-related complications remain important concerns [7].

In recent years, the peroneus longus tendon

autograft has emerged as a promising alternative graft option for ACL reconstruction. The peroneus longus tendon possesses adequate length, diameter and tensile strength comparable to other commonly used grafts [8]. Harvesting of the tendon is technically simple and associated with minimal donor site morbidity and satisfactory ankle function preservation. Several studies have demonstrated favorable clinical and functional outcomes following ACL reconstruction using peroneus longus tendon autograft, with significant improvement in knee stability and patient satisfaction [9,10].

Assessment of postoperative knee stability and functional recovery is essential for determining the success of ACL reconstruction [11]. Clinical stability tests such as Lachman test, anterior drawer test and pivot shift test are commonly used to evaluate ligament integrity, while functional scoring systems such as the Lysholm Knee Score help assess patient-reported functional outcomes [12]. Despite increasing interest in the use of peroneus longus tendon autograft, limited data are available regarding its effectiveness in our clinical setting.

Therefore, this study was undertaken to evaluate knee stability and functional outcome following ACL reconstruction with peroneus longus tendon autograft among patients treated at Khwaja Yunus

Ali Medical College & Hospital, Bangladesh. The findings of this study may contribute to assessing the effectiveness and feasibility of this graft option in routine orthopedic practice.

METHODS & MATERIALS

This prospective observational study was conducted in the Department of Orthopaedics & Traumatology at Khwaja Yunus Ali Medical College & Hospital from December 2023 to May 2026 over a period of 2.5 years. A total of 40 patients diagnosed with anterior cruciate ligament (ACL) injury who underwent ACL reconstruction using peroneus longus tendon autograft were included in the study. Patients aged between 18 and 50 years with symptomatic ACL tear confirmed clinically and by magnetic resonance imaging (MRI), who were willing to participate and provide informed written consent, were included in the study. Patients with multi-ligament knee injuries, previous knee surgery, advanced osteoarthritis, active infection, fracture around the knee joint, neuromuscular disorders, or severe systemic illness were excluded from the study.

All patients underwent detailed history taking, physical examination and radiological assessment before surgery. Arthroscopic ACL reconstruction was performed using ipsilateral peroneus

longus tendon autograft following standard operative procedures. Postoperative rehabilitation protocol was followed uniformly for all patients. Knee stability was assessed by Lachman test, anterior drawer test and pivot shift test, while functional outcome was evaluated using the Lysholm Knee Scoring Scale during follow-up visits.

Collected data were compiled, edited and analyzed using IBM SPSS Statistics. Quantitative variables were expressed as mean \pm standard deviation, whereas qualitative variables were presented as frequency and percentage.

RESULTS

Table I presents the demographic characteristics of the 40 study patients who

underwent ACL reconstruction with peroneus longus tendon autograft. The mean age of the patients was 31.8 ± 8.6 years, with the largest age group being 26–35 years (42.5%). The study population was predominantly male (77.5%) and service holders (32.5%) constituted the most common occupational category, followed by students (22.5%).

Table I
Demographic Characteristics of the Study Patients (n=40).

Variables	Frequency (n)	Percentage (%)
Age group (years)		
18–25	11	27.5
26–35	17	42.5
36–45	9	22.5
>45	3	7.5
Mean \pm SD	31.8 \pm 8.6 years	
Sex		
Male	31	77.5
Female	9	22.5
Occupation		
Service holder	13	32.5
Farmer	7	17.5
Student	9	22.5
Businessman	6	15
Others	5	12.5

Table II outlines the clinical profile and injury characteristics of the 40 patients. The right knee was more commonly involved, accounting for 57.5% of cases. Sports injury was the predominant mode of

injury (40%), followed by road traffic accidents (27.5%). Associated meniscal injury was present in 37.5% of patients. Regarding the timing of surgical intervention, most patients (47.5%)

underwent surgery between 6 to 12 months following injury, while 35% were operated within 6 months.

Table II
Clinical Profile and Injury Characteristics of the Patients (n=40).

Variables	Frequency (n)	Percentage (%)
Side involved		
Right knee	23	57.5
Left knee	17	42.5
Mode of injury		
Sports injury	16	40
Road traffic accident	11	27.5
Fall during daily activities	8	20
Occupational injury	5	12.5
Associated meniscal injury		
Present	15	37.5
Absent	25	62.5
Time from injury to surgery		
<6 months	14	35
6–12 months	19	47.5
>12 months	7	17.5

Table III demonstrates the significant improvement in knee stability following ACL reconstruction using peroneus longus tendon autograft. Preoperatively, the Lachman test was positive in 97.5% of

patients, which dramatically decreased to only 10.0% postoperatively. Similarly, the Anterior Drawer test improved from 92.5% positive preoperatively to 12.5% positive after surgery and the Pivot Shift test

showed positivity in 85.0% of patients preoperatively compared to just 15.0% postoperatively.

Table III
Evaluation of Knee Stability Following ACL Reconstruction (n=40).

Knee Stability Parameters	Preoperative n (%)	Postoperative n (%)
Anterior Drawer Test		
Positive	37 (92.5)	5 (12.5)
Negative	3 (7.5)	35 (87.5)
Lachman Test		
Positive	39 (97.5)	4 (10.0)
Negative	1 (2.5)	36 (90.0)
Pivot Shift Test		
Positive	34 (85.0)	6 (15.0)
Negative	6 (15.0)	34 (85.0)

Table IV presents the functional outcomes based on the Lysholm Knee Score before and at six months following ACL reconstruction. Preoperatively, the majority of patients (60.0%) had poor knee function,

with a mean score of 58.6 ± 9.4 . At six months postoperatively, there was a marked improvement, with 47.5% of patients achieving excellent function and 35.0% achieving good function. The mean

Lysholm score increased significantly to 91.3 ± 6.8 and only 5.0% of patients remained in the poor category.

Table IV
Functional Outcome According to Lysholm Knee Score After ACL Reconstruction (n=40).

Lysholm Knee Score	Preoperative	Postoperative (6 months)
Excellent (95–100)	0 (0.0%)	19 (47.5%)
Good (84–94)	4 (10.0%)	14 (35.0%)
Fair (65–83)	12 (30.0%)	5 (12.5%)
Poor (<65)	24 (60.0%)	2 (5.0%)
Mean \pm SD	58.6 ± 9.4	91.3 ± 6.8



Figure 1 Intraoperative Steps of Arthroscopic ACL Reconstruction Using Peroneus Longus Tendon Autograft.

Figure 1 illustrates the key intraoperative stages of arthroscopic anterior cruciate ligament (ACL) reconstruction using a peroneus longus tendon autograft. The left panel demonstrates tendon harvesting from the ipsilateral leg, the middle panel shows preparation of the harvested peroneus longus graft on the surgical table, and the right panel presents the arthroscopic view following graft placement and fixation within the knee joint. These images highlight the surgical technique and successful reconstruction of the ACL using a peroneus longus tendon autograft.

DISCUSSION

Anterior cruciate ligament (ACL) reconstruction is widely accepted as the standard treatment for restoring knee stability and function in ACL-deficient patients. In the present study, we evaluated

knee stability and functional outcomes following ACL reconstruction using peroneus longus tendon autograft in 40 patients over a period of 2.5 years. The study demonstrated significant improvement in both objective stability tests and subjective functional outcomes. In our study, the majority of patients (42.5%) were in the 26–35 years age group with a male predominance (77.5%), which reflects the higher involvement of young active males in trauma-related knee injuries. Similar demographic patterns were reported by Roy CR et al., who also found young adult males to be the most commonly affected group undergoing ACL reconstruction with peroneus longus grafts [13]. Hossain GJ et al., further supported that ACL injuries predominantly occur in active working-age males engaged in sports or occupational activities [14].

Regarding injury characteristics, sports-related trauma (40%) was the most common mechanism in our study, followed by road traffic accidents (27.5%). Islam N et al. also observed sports injury as the leading cause of ACL rupture in their cohort, reinforcing the association between pivoting sports and ACL damage [15]. The right knee involvement (57.5%) in our study is comparable to findings by Hasan MA et al., who reported a slight predominance of right-sided ACL injuries [16]. A key finding of our study was the marked improvement in knee stability following surgery. The Lachman test positivity decreased from 97.5% preoperatively to 10% postoperatively, while the anterior drawer test improved from 92.5% to 12.5%. Similarly, pivot shift positivity reduced from 85% to 15%. These findings

are consistent with Islam N et al. and Kumar R et al., who reported significant postoperative reduction in instability tests following peroneus longus tendon reconstruction [15,17]. Agrawal S et al., also demonstrated excellent restoration of mechanical stability with peroneus longus autograft, supporting its biomechanical adequacy [18].

Functional outcomes in our study showed a substantial improvement in Lysholm Knee Score, increasing from a preoperative mean of 58.6 ± 9.4 to 91.3 ± 6.8 at 6 months postoperatively. Postoperatively, 47.5% of patients achieved excellent and 35% achieved good outcomes, while only 5% remained in the poor category. Similar improvements were reported by Kapoor R et al., where peroneus longus graft showed comparable or superior functional outcomes compared to hamstring graft [19]. Vijay C et al., also demonstrated significantly improved functional scores with peroneus longus autograft in randomized controlled settings [20]. Comparative studies by Gök B et al. and Sari MK et al., have shown that peroneus longus graft provides outcomes comparable to hamstring grafts with no significant compromise in knee function [21,22]. Punnoose DJ et al. highlighted better graft diameter and lower donor site morbidity with peroneus longus tendon, which may contribute to improved stability outcomes observed in our study [23]. Additionally, Butt U et al. reported sustained long-term outcomes with peroneus longus graft over five years, supporting its durability [24]. Concerns regarding donor site morbidity, particularly ankle stability, have been evaluated by Karapinar SE et al., who found no significant long-term ankle instability following graft harvest [25]. Similarly, Goyal T et al. and Quinn M et al., concluded that peroneus longus tendon is a viable alternative graft with acceptable safety and functional outcomes [26,27].

LIMITATIONS

This study has some limitations that should be considered while interpreting the results. It was a single-center study with a relatively small sample size of 40 patients, which may limit the generalizability of the findings. The follow-up period was also limited to short-term outcomes and long-term graft performance, knee stability and functional durability could not be fully assessed. In addition, there was no control group using other graft types for direct comparison, which restricts comparative evaluation of the peroneus longus tendon autograft.

CONCLUSION

ACL reconstruction using peroneus longus tendon autograft demonstrated significant improvement in knee stability and

functional outcomes in this study. There was a marked reduction in clinical instability tests and a substantial increase in Lysholm Knee Scores after surgery, indicating good to excellent functional recovery in most patients. The peroneus longus tendon autograft appears to be a reliable and effective graft option for ACL reconstruction, offering satisfactory clinical results with promising outcomes in appropriately selected patients.

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CONFLICTS OF INTEREST

There are no conflicts of interest.

REFERENCES

- Zhang S, Cai G, Ge Z. The efficacy of anterior cruciate ligament reconstruction with peroneus longus tendon and its impact on ankle joint function. *Orthopaedic Surgery*. 2024 Jun;16(6):1317-26.
- Agarwal A, Singh S, Singh A, Tewari P. Comparison of functional outcomes of an anterior cruciate ligament (ACL) reconstruction using a peroneus longus graft as an alternative to the hamstring tendon graft. *Cureus*. 2023 Apr 7;15(4).
- Rajani AM, Shah UA, Mittal AR, Rajani A, Punamiya M, Singhal R. Functional and clinical outcome of anterior cruciate ligament reconstruction with peroneus longus autograft and correlation with MRI after 3 years. *Journal of Orthopaedics*. 2022 Nov 1;34:215-20.
- Teja KC, Kumar S, Kumar A, HariPriya H. Long-term outcomes of anterior cruciate ligament reconstruction: Peroneus longus versus hamstring tendons. *Journal of Arthroscopic Surgery and Sports Medicine*. 2025 Jul 5;6(2):174-8.
- Sadi SM, Chowdhury AZ, Hossen M, Mahmud CI, Ahmed AM, Mahub W. Evaluation of the functional outcome of arthroscopic isolated anterior cruciate ligament reconstruction by peroneus longus tendon autograft. *International Journal of Orthopaedics*. 2023;9(4):43-8.
- Hassan AZ, Zein A. Functional knee and ankle outcomes of a peroneus longus tendon autograft for primary reconstruction of the anterior cruciate ligament. *The Egyptian Orthopaedic Journal*. 2024 Jul 24;59(2):125-31.
- Reddy KS, Keerthi N, Sarvani KK. Functional Outcome Between Peroneus Longus Vs Hamstring Graft in an ACL Reconstruction. *European Journal of Cardiovascular Medicine*. 2023 Oct 30;13:2346-51.
- Acharya K, Mody A, Madi S. Functional outcomes of anatomic single bundle primary ACL reconstruction with peroneus longus tendon (without a peroneal tenodesis) versus hamstring autografts. *Archives of Bone and Joint Surgery*. 2024;12(2):116.
- Keyhani S, Qoreishi M, Mousavi M, Ronaghi H, Soleymanha M. Peroneus longus tendon autograft versus hamstring tendon autograft in anterior cruciate ligament reconstruction: a comparative study with a mean follow-up of two years.

- Archives of Bone and Joint Surgery. 2022 Aug;10(8):695.
- Agrawal V, Ravikiran HG, Santhosh MS, Vijay C, Prashasth BS, Chandra A. Assessment of functional outcome and donor site morbidity in anterior cruciate ligament reconstruction using peroneus longus autograft. *Journal of Medical Sciences and Health*. 2022 Jan;8(1):22-7.
- Opoku M, Abdramane AM, Abdirahman A, Fang M, Li Y, Xiao W. Can peroneus longus tendon autograft become an alternative to hamstring tendon autograft for anterior cruciate ligament reconstruction: a systematic review and meta-analysis of comparative studies. *Journal of Orthopaedic Surgery and Research*. 2025 Jul 29;20(1):719.
- 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 Surgery, Sports Traumatology, Arthroscopy*. 2025 Sep 30.
- Roy CR, Das PK, Hossain I, Islam F. Result of Anterior Cruciate Ligament Reconstruction by the Peroneus Longus Tendon. *The Insight*. 2025 Dec 22;8(03):618-22.
- Hossain GJ, Islam MS, Khan MM, Islam MR, Rahman SM, Jahan MS, Halder RC, Rahaman SK, Al Mamun MB, Harun ME. A prospective study of arthroscopic primary ACL reconstruction with ipsilateral peroneus longus tendon graft: Experience of 439 cases. *Medicine*. 2023 Mar 3;102(9):e32943.
- Islam N, Ferdous GS, Dey D, Rahman M, Diba AN, Rasul A. Peroneus Longus Tendon Autograft in ACL Reconstruction—Clinical and Biomechanical Outcomes. *The Insight*. 2025 Dec 12;8(03):514-8.
- Hasan MA, Morshed T, Alam MK, ul Matin MA, Roy LK, Rahman MM, Hasan MI, Ahmed MB. Evaluation of the Results of Arthroscopic Anterior Cruciate Ligament Reconstruction with Peroneus Longus Autograft. *Journal of Comilla Medical College Teachers' Association*. 2025 May 20;29(1):26-31.
- Kumar R, Sheoran A, Devgan A, Yadav U, Yadav N, Bishnoi S, Kumar S, Yadav N. Evaluation of functional outcome following arthroscopic anterior cruciate ligament reconstruction using peroneus longus graft. *Int J Life Sci Biotechnol Pharma Res*. 2023;12(3):399-406.
- Agrawal S, Hegde AS, Rao BS, Mane PP, Shetty CB, Khanna V, Thakkar S, Divakar PM, Nigam A. Peroneus Longus Tendon Autograft for Primary Arthroscopic Reconstruction of the Anterior Cruciate Ligament. *Muscles, Ligaments & Tendons Journal (MLTJ)*. 2023 Apr 1;13(2).
- Kapoor R, Sharma B, Dinkar KS, Sharma Y, Gautam VK, Agarwal A, Singh VK, KAPOOR R, kumar Gautam V. Functional Outcomes After Single-Bundle Anterior Cruciate Ligament Reconstruction: A Comparative Analysis of Hamstring and Peroneus Longus Autografts. *Cureus*. 2025 Oct 29;17(10).
- Vijay C, Santosh MS, Avinash C, Adarsh T. Is Peroneus longus autograft a better alternative to the Hamstring autograft for

- anterior cruciate ligament reconstruction?— A randomised control study. *Journal of Orthopaedics, Trauma and Rehabilitation*. 2022 Jun;29(1):22104917221088335.
21. Gök B, Kanar M, Tutak Y. Peroneus longus vs hamstring tendon autografts in ACL reconstruction: a comparative study of 106 patients' outcomes. *Medical Science Monitor: International Medical Journal of Experimental and Clinical Research*. 2024 Oct 26;30:e945626.
 22. Sari MK, Kose O. Peroneus Longus Versus Hamstring Tendon Graft for Anterior Cruciate Ligament Reconstruction: A Retrospective Matched Comparison. *Journal of Clinical Medicine*. 2025 Oct 16;14(20):7319.
 23. Punnoose DJ, Varghese J, Theruvil B, Thomas AB. Peroneus longus tendon autografts have better graft diameter, less morbidity and enhanced muscle recuperation than hamstring tendon in ACL reconstruction. *Indian Journal of Orthopaedics*. 2024 Jul;58(7):979-86.
 24. Butt U, Vuletic F, Shaikh MA, Amanullah, Rehman GU, Shah IA, Stålman A, Khan ZA. 5-years outcomes following arthroscopic anterior cruciate ligament reconstruction comparing quadruple hamstring and peroneus longus tendon autografts: a randomized control trial. *Archives of orthopaedic and trauma surgery*. 2024 Dec 23;145(1):85.
 25. Karapinar SE, Tas A, Dincer AP, Atay PT, Baydar PM, Kumbul H. An Evaluation of the Effect on Ankle Stability of the Peroneus Longus Tendon Graft Used in Anterior Cruciate Ligament Reconstruction. *Orthopaedic Journal of Sports Medicine*. 2025 Sep;13(9):23259671251371229.
 26. Goyal T, Paul S, Choudhury AK, Sethy SS. Full-thickness peroneus longus tendon autograft for anterior cruciate reconstruction in multi-ligament injury and revision cases: outcomes and donor site morbidity. *European Journal of Orthopaedic Surgery & Traumatology*. 2023 Jan;33(1):21-7.
 27. Quinn M, Byrne RA, Albright JA, Testa E, Ahn B, Lemme N, Petit L, Blankenhorn B, Owens BD. Peroneus longus tendon autograft may present a viable alternative for anterior cruciate ligament reconstruction: a systematic review. *Arthroscopy: The Journal of Arthroscopic & Related Surgery*. 2024 Apr 1;40(4):1366-76.