EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 12
Issue: 9
Year: 2025

A COMPARATIVE STUDY OF PERONEUS LONGUS TENDON AUTO GRAFT VERSUS HAMSTRING TENDON AUTO GRAFT IN ANTERIOR CRUCIATE LIGAMENT RECONSTRCTION

Dr. Varadraj Deshmukh*

P.G. Student of Orthopaedics Department, Krishna Vishwa Vidyapeeth Karad.

***Corresponding Author: Dr. Varadraj Deshmukh**

P.G. Student of Orthopaedics Department, Krishna Vishwa Vidyapeeth Karad.

Article Received on 30/07/2025 **Article Revised on 21/08/2025** **Article Accepted on 10/09/2025**

ABSTRACT

Anterior cruciate ligament (ACL) reconstruction commonly uses a hamstring tendon autograft, but the peroneus longus tendon can also be used. This study aimed to eompare outcomes of anterior cruciate ligament reconstruction in 106 patients using peroneus longus tendon and hamstring tendon autografts. MATERIAL AND METHODS ACL repair was performed on 54 patients using a hamstring tendon autograft and 52 patients with a peroneus longus tendon autograft. Knee function was assessed using the International Knee Documentation Committee (IKDC) and Lysholm scores, while the ankle was evaluated using the American Orthopedic Foot and Ankle Score (AOFAS) and the Foot & Ankle Disability Index (FADI) scores. Donor-site morbidity and graft characteristics were compared. RESULTS There was no difference between the 2 groups in terms of knee IKDC and Lysholm scores ($p = 0.49$ $p = 0.68$ respectively). The diameter of the peroneus longus tendon graft (8.56±0.93) was significantly larger than the hamstring tendon (7.44±0.6) ($p < 0.001$) The peroneus graft harvesting time was significantly shorter ($p < 0.001$) Thigh hypotrophy and donor-site morbidity were significantly higher in the hamstring group ($p < 0.001$ and $p = 0.006$) The.

INTRODUCTION

Antenor cruciate ligament (ACL) reconstruction is the frequent athroscopic surgery with more than 100,000 cases per year in The United States and about 12.000 cases annually in Thulan.

Although surgeons widely agreed that the most important abictors affecting successful ACT reconstruction are position of both fernonil and that tunnels, strength and size of graft d not be ignored. There are many graft options for antenor crucrate Iigament reconstruction with the common choiees being bone patelle tendon bone graft and hamstring tendon graft Hamstring tendon is easy harvest, less mortality, but may reduce hamstring power and may cause thigh hypotrophy Bone patellar tendon bout graft may allow foster return to sport, while may mse knodane pan and knee stiffness In some situations which need several grafts for reconstruction as in multip kigament injury, there are options like quadriceps tend graft, peroneus longas tendon graft, allograft, or contralater grafts can be used. The ideal graft should have enous strength, casy and safe to harvest, and dispensaht Peroncus kagus tendon can be easily harvested therefore can be used as an altemate graft choice. Several studi demonstrated acceptable biomechanics of peroneus tendon.

Peroneus longus plays an important role in foot and ankle biomechanics, entire removal of the graft may posiably affect function in some way. Recently, anterior half peroneus longus tendon (AHPLT) was suggested as an ultimate choice to whole peroneus tendon with acceptable length, sizes, and quality Size of tendon is another concem regarding graft choice. It is widely accepted that graft of minimum diameter of 7mm is recommended. ln general, Asian population have smaller stature compared Caucasians, we hypothesize that this may contribute to snaller AHPLT graft diameter which affect as longevity and functional results.

This study aimed to compare physical examination and functional outcome using. The Intemational Knee Docomentation committee (IKDC) subjective score between AHPLT graft and conventional hamstring graft for ACT reconstruction.

Through distal incision. The sheath around the peroneus tendon was closed, subcutaneous and skin closure was done afterwards.

Hamstring graft was harvested in standard fashion, the semitendinosus tendon was used as single graft if applic able. The gracilis tendon was harvested as an additional

graft if quadruple semitendinosus tendon graft size was less than 7 mm in diameter. Standard anterolateral and ante-romedial arthroscopic portals were created. Meniscus and cartilage surgery were done as necessary. All patients were operated with standard anatomic single bundle ACL reconstruction. The femoral tunnel was created based on the identified anatomic footprint, with the center placed at the lateral bifurcate ridge and below the lateral intercondy lar ridge. The tibial tunnel was based on the anterior hom of lateral meniscus and ACL stump insertion site. The femoral fixation of the graft was done with suspension device (XO button.

All patients received the same rehabilitation protocol, an adjustable frame with four-point fixation knee brace was applied for a month, 0-60 degree flexion for two weeks.

PATIENTS AND METHODS

Patients,

This is a prospective comparative study conducted on 75 patients with deficient ACL. Patients were admitted to El Hadra University Hospital between June 2019 and September 2020. All cases were followed up for a maximum of 1 year postoperatively. Only cases with isolated ACL injury with no other knee ligamentous injuries who were planned for single bundle ACL reconstruction were included in the study.

The exclusion criteria were as follows

- Other knee ligamentous injuries.
- Skeletally immature patients less than 16 years.
- Patients more than 45 years.
- Knee arthritis more than GII Kellgren-Lawrence grading.[13]
- Obvious knee varus deformity more than 6°.
- Bilateral ACL injury.
- Previous knee surgery in the ipsilateral knee.
- Ipsilateral ankle instability.

Methods

This retrospective cohort study was approved by the hos pital ethic Committee and meluded patients age 15-55 years and body mas indes (BMI) between 18-35 kg/m² who underwent antenor curiate ligament reconstruction with anterior half peronens longus tendon and hamstring tendon from January 2015 to December 2016 in the provin-aal hospital. The exclusion critena were patients with col-Lateral ligament instability grade Il or above, previous by amend reconstruction, previous knee osteoarthritis Kellgren-Lawrence: KL-ll or above and patient loss to follow-up before 3 years. Preoperative physical examine tons including Lachman test, anterior drawer test, and pivot sitt test were performed. Self-administration of the IKDC subjective score Than version) was collected."

All patients were operated with standard anatomic single bundle ACL reconstruction by single expeneneed orthopedie surgeon, Antenor half peroneus longos tendon was harvested using 3 cm long skin incision starting 2 cm proximal from distal tip of lateral malleolus extending in proximal direction. The peroneus tenulon can be identified under the skin, the sheath was opened along its libers, and the peroneus longus was separated from the peroneus brevis A stab incision was performed in the middle of the peroncus long us tendon, separated anterior and poster for portion along its fiber, then a suture loop was used to sing around antenor half of the peroncus longus tendon. The ankle was placed to plantat flexion and eversion, anter nor half of the peroneus longus tendon was released about I am proximal from the distal tip of lateral mallcolus. The free end of the tendon was sutured, the tendon harvester was moved proximally and the free graft was retrieved through drtal incision. The sheath ansund the petoneus tendon was closed, subcutaneous and skin closure was done atlerwants (Hamstring graft was harvested in standard fashion, the semitendinosus tendon was used as single grat if applic able. The gracilis tendon was harvested as an additional graft if quadruple semitendimosus tendon graft sure was less than 7 mm in diameter. Standard anterolateral and ante romedial arthroscopic portals were created. Meniscus and cartilage surgery were done as necessary. All patients were opented with standard anatomic single bundle ACL reconstruction. The femoral tunnel was created based on the identifial anatomic footprint, with the center placed as the lateral bifurcate ridge and below the lateral intercondy lar nidge The tibial tunnel was based on the antenor born of Lateral meniscus and ACL stump insertion site. The femoral fixation of the graft was done with suspension device (XO Extton, Come Limane while the tibial fixtion was done with interference screw (ys, Comed-Lmv FEUSAL.

All patients received the same rehabilitation protocol, an aljustable kane with four-point fixation knee brace was applied for a month, 0-60 degree flexion for two weeks and unlocked afterwand Partial werght beanng was dlowed after two weeks and full weight bearing was allowed after a month. All patients were scheduled for follow-up at 2 weeks, 2, 4, 6, 12 months, 2, 3 years post operatively and IKDC at 3 years were collected to deter mane the functional outcome. Complications such as pares-thesia, ankle instability were collected at immediate postoperative time and along with the follow-up periods.

Data were analyzed using mean and standard deviation for continuous vanables, and using frequency with percent-age for categorical data. The unpaired t-test, and Fisher's exact test were used to compare cach factor between groups. For non-nonnally distributed continuous vanables, median (cange), and Mana Whitney U test was applied Regression analysis was done to identify factors related with IKDC, and binary regression (relative risk and 95% confidence interval; CI) for those associated with pod-operative antenor drawer test. Factors that had p-value < 0.1 were considered as potential confounding factors and were brought inte multivariate analysis. The parsimonious final model was selected. All statistical

analysis was per-formed using STATA 16.0, StataCorp, College Station, Texas, USA. Significant p-value was 0.05.

Surgical technique

All patients were operated supine under general anesthesia with a high thigh tourniquet. A side support was used, and patients were positioned to allow free knee motion between 0° and 120°. First, knee arthroscopy was done to deal with any intra-articular pathologies and to assess ACL rupture. Standard anterolateral and anteromedial portals were used. Graft harvesting of either the ipsilateral peroneus longus or the HT was then performed.

CONCLUSION

The use of peroneus longus autograft in primary ACL reconstruction is a safe procedure with an excellent outcome. PLT autograft can be recommended as an alternative graft in single-bundle ACL reconstruction. Moreover, PLT can successfully and safely reinforce unqualified HT grafts for ACL reconstructions. No significant complications of the ankle-donor site were noted. Stronger evidence is recommended with multicentric, network meta-analysis of randomized trials to support the peroneus longus autograft use for ACL reconstruction.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Lohmander LS, Englund PM, Dahl LL, Roos EM The long-term consequence of anterior cruciate ligament and meniscus injuries: osteoarthritis Am J Sports Med.

REFERENCS

1. Bi M. Zhao C. Zhang S. et al. All-inside single-bundle recon-struction of the anterior cruciate ligament with the anterior half of the peroneus longus tendon compared to the semiten-dinosus tendon: a two-year follow-up study. J Knee Surg., 2018; 31: 1022-1030.
2. Angthong C. Chernchujit B. Apivatgaroon A, et al. The anter-tot cruciate ligament reconstruction with the peroneus longus tendon: a biomechanical and clinical evaluation of the donor ankle morbidity. J Med Assoc Thai., 2015; 98: 555-560.
3. Zhao J and Huangfu X. The biomechanical and clinical appli-cation of using the anterior half of the peroneus longus tendon as an autograft source. Am J Sports Med., 2012; 40: 662-671.
4. Rhatomy S. Asikin AIZ, Wardani AE, et al. Peroneus longus autograft can be recommended as a superior graft to hamstring tendon in single-bundle ACL reconstruction. Knee Surg Sports Traumatol Arthrosc, 2019; 27: 3552-3559.
5. Karlsson J, Irrgang JJ. van Eck CF, et al. Anatomic single-and double-bundle anterior cruciate ligament reconstruction, part 2: clinical application of surgical technique. Am J Sports Med., 2011; 39: 2016-2026.
6. Park CH and Lee WC. Donor site morbidity after lateral ankle ligament reconstruction using the anterior half of the peroneus longus tendon autograft. Am J Sports Med., 2017; 45: 922-928.
7. Papastergiou SG. Konstantinidis GA, Natsis K, et al. Adequacy of semitendinosus tendon alone for anterior cruci-ate ligament reconstruction graft and prediction of hamstring graft size by evaluating simple anthropometric parameters. Anat Res Int., 2012; 2012: 424158.
8. Collaboration NCDRF. Height and body-mass index trajec-tories of school-aged children and adolescents from 1985 to 2019 in 200 countries and territories: a pooled analysis of 2181 population-based studies with 65 million participants. Lancet, 2020; 396: 1511-1524.
9. Lertwanich P. Praphruetkit T. Keyurapan E, et al. Validity and reliability of Thai version of the international knee.