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EVAULUATION OF AVERAGE THICKNESS OF DOUBLED PERONEUS LONGUS TENDON GRAFT IN ACL RECONSTRUCTION

Orthopaedics

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ABSTRACT

Background: The peroneus longus tendon has emerged as a promising graft for anterior cruciate ligament (ACL) reconstruction due to its strength and availability. **Objective:** To evaluate the average diameter of doubled peroneus longus grafts used in ACL reconstruction in 40 patients. **Methods:** Grafts were harvested from 40 patients undergoing primary ACL reconstruction and measured intraoperatively. **Results:** The mean diameter of the doubled peroneus longus graft was 8.425 mm. **Conclusion:** The doubled peroneus longus tendon provides an adequate graft diameter suitable for ACL reconstruction in most cases.

KEYWORDS

Peroneus longus tendon, ACL reconstruction, graft diameter, autograft, tendon thickness.

INTRODUCTION

Anterior cruciate ligament reconstruction post ligament injury improves knee stability and function[1]. The procedure commonly utilizes autografts such as hamstring or patellar tendons; the advantages and disadvantages of which have been extensively studied[2].

The peroneus longus tendon is gaining popularity due to its favorable biomechanical properties and synergistic function of peroneus longus and peroneus brevis[3]. Some studies suggest peroneus brevis as the more effective everter of ankle justifying peroneus longus graft harvest[3].

Graft diameter plays a crucial role in surgical success and long-term outcome. This study aims to assess the average thickness of doubled peroneus longus graft used in ACL reconstruction among 40 patients.

MATERIALS AND METHODS:

This prospective observational study had been conducted in Tertiary Health Care centre in Bharuch. The diagnosis of Anterior Cruciate Ligament(ACL) rupture was established and the patients gave their informed consent to be included in this study. Fourty patients underwent single-bundle ACL reconstruction from January 2022 to June 2024. The peroneus longus tendon was used as an autograft in the Arthroscopic ACL reconstruction in these patients. The inclusion criteria were patients with an rupture of the ACL, age 18–45 years and use of ipsilateral peroneus longus graft for reconstruction. The exclusion criteria were as follows: multiligament injury, fracture around the knee, previous lower limb surgeries, peroneal tendon pathology and the presence of a pathological condition in the lower extremity.

Surgical Technique:

For the peroneus tendon graft harvest, the location of the skin incision was marked, 2–3 cm above and 1 cm behind the lateral malleolus. The incision was made through the skin, subcutaneous tissue and superficial fascia. The peroneus longus and peroneus brevis tendons were identified. The location of the tendon division was marked, 2–3 cm above the level of the lateral malleolus. The distal part of the peroneus longus tendon was sutured to the peroneus brevis tendon with end-to-side sutures. The peroneus longus tendon was stripped proximally with a tendon stripper to about 4–5 cm from the fibular head to prevent peroneal nerve injury. Harvested tendon was doubled and whip-stitched. Diameter measured using a graft-sizing block at midpoint.

Statistical Analysis: Mean, standard deviation (SD), and range calculated.

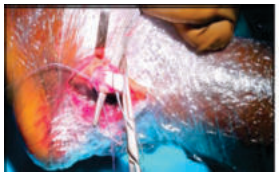


Figure 1: showing peroneus longus graft harvesting and Graft preparation

RESULTS:

Patient Demographics:

- **Mean Age:** 25.625 years (range: 18–40 years)
- **Male: Female Ratio** = 3:1

Graft Diameter:

- **Mean:** 8.425 mm
- **Range:** 7– 10 mm
- **SD:** 0.87 mm

Graft Diameter Distribution:

- **7 mm:** 5 cases
- **8 mm:** 18 cases
- **9 mm:** 12 cases
- **10mm:** 5 casesNo intraoperative graft inadequacy noted.

Table 1: Demographic And Graft Data

Parameter	Value
Number of Patients	40
Mean Age (years)	25.625 years
Male:Female	3:1
Mean Graft Diameter	8.425 mm
Range	7-10 mm

DISCUSSION:

This study confirms the peroneus longus tendon as a consistent autograft source for ACL reconstruction. Compared to traditional grafts, it offers similar or better diameter, with added ease of harvest and less morbidity. We found that diameter of peroneus longus tendon graft was greater when comparing to average graft diameter of hamstring tendons from other studies[1]. The effect of the autograft diameter on the re-rupture and revision rate of the reconstructed ACL of the knee has been studied widely. Some authors have suggested that reduction in autograft diameter is related to a higher revision rate in patients[4]. The doubled tendon met the size requirement (>7 mm) in most patients, reducing risk of graft failure. Limitations include single-center data, lack of long-term follow-up, and no biomechanical testing. Future studies should correlate graft size with functional outcomes and rerupture rates.

CONCLUSION:

The doubled peroneus longus graft consistently provides adequate thickness for ACL reconstruction. It can be considered a reliable alternative to hamstring and patellar tendon grafts, especially when these are unsuitable.

Compliance With Ethical Standards:

Conflict Of Interest: None declared

Ethical Approval: The study was approved by the institutional ethics committee.

All patients gave an informed consent for participating in this study

Funding: No funding sources

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