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Peroneus Longus vs Hamstring Tendon Autografts in ACL Reconstruction: A Comparative Study of 106 Patients' Outcomes

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Abstract

BACKGROUND: Anterior cruciate ligament (ACL) reconstruction commonly uses a hamstring tendon autograft, but the peroneus longus tendon can also be used. This study aimed to compare 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 donor ankle AOFAS score was 93.46±3.8, and the FADI score was 93.48±4.6. No morbidity associated with the peroneus longus graft was observed.

CONCLUSIONS: Patients who underwent ACL reconstruction using the peroneus longus tendon experienced faster knee rehabilitation and less donor-site morbidity, such as thigh hypotrophy and knee pain. The peroneus longus tendon, with its larger diameter, fewer graft-related complications, and similar knee scores compared to the hamstring group, is considered a suitable alternative graft source.

KEYWORDS: anterior cruciate ligament reconstruction, Hamstring Tendons, Knee, Humans, Male, Female, adult, autografts, Treatment Outcome, Tendons, Transplantation, Autologous, Anterior Cruciate Ligament Injuries, Anterior Cruciate Ligament, young adult, Knee Joint, Adolescent

Introduction

Nearly half of all knee injuries occur to the anterior cruciate ligament (ACL), making it the most frequently torn ligament in the knee. In the United States alone, the yearly reported incidence is roughly 1 in 3500 persons. In the United States, there are about 400 000 ACL repairs performed annually [1]. The majority of ACL rips in athletes are caused by non-contact pivoting injuries, in which the knee is slightly flexed and in valgus and the tibia translates anteriorly. An other mechanism of injury that has been observed is a direct blow to the lateral knee [2]. ACLs can be evaluated using a variety of provocative techniques, including as the anterior drawer, pivot shift, and Lachman tests. While MRI imaging can be used to confirm the diagnosis of ACL injury, clinical diagnosis is still possible. The most common method for diagnosing ACL pathology is MRI, which has 86% sensitivity and 95% specificity. Knee arthroscopy can also be used for diagnosis to distinguish between total, partial, and chronic tears [3]. The handling of ACLs should be customized. Treatments that do not involve surgery are also appropriate. When there is decreased ACL laxity in patients with modest demand or in athletes who play sports that do not require cutting or pivoting motions, non-operative treatment is recommended. Physiotherapy and lifestyle changes are typically used to treat these people [4]. The 2 primary surgical therapy options for an ACL rupture are reconstruction or repair. In younger (>40 years old), active, high-demand individuals with a complete ACL rupture, repair of the injured ligament is recommended. Restoring anterior and rotational stability by anatomical ACL repair is the main goal, since it reduces the likelihood of secondary meniscal or chondral injuries. The most popular methods for reconstructions are single and double bundles done by arthroscopically [5]. The goal of ACL reconstruction (ACLR) is to create a stable knee so that the patient can resume normal daily activities or sports following surgery [6]. The use of different grafts in ACLR has changed significantly during the past few decades. With differing degrees of effectiveness, autografts, allografts, and synthetic grafts have all been attempted [7]. The 2 most popular grafts utilized for ACLR are four-strand hamstring autografts and bone-patellar tendon-bone (BPTB) autografts. Each has advantages and limitations. The most effective graft option, according to the most recent studies, is bone-to-bone healing. This allows for the efficient integration of the graft and tunnel, resulting in a quicker return to function and athletic activity [8]. In professional athletes with ACL problems, this trait is crucial. It is not appropriate for double-bundle reconstruction and anterior kneeling discomfort because of the risk of patellar fracture, invasiveness of the procedure, large incision, fixed length, and being weaker than the original ACL [9]. In countries where people regularly kneel while praying, it is thought to be particularly important to be pain-free when doing so. These factors are contributing to the growing popularity of hamstring autografts [10]. The semitendinosus and/or gracilis tendon can be used to harvest hamstring tendon (HT) autografts. Graft configurations for HT autografts can vary greatly, with the most popular being quadrupled hamstring [11]. Patients' hamstring tendons are connected with their anthropometrics and level of sports activity, making them patient-dependent, even though BPTB and quadriceps tendons autograft are generally consistent in terms of length and thickness [12]. The size of the ACL footprint is not correlated with the graft size. In comparison to patellar tendon autografts, microscopic examination of HT autografts shows a 20–40% increase in collagen fibrils and fibroblasts [13].

Because the peroneus longus and brevis work together, the longus can be saved for an autograft. This tendon is being used more and more as a graft in reconstructive orthopedics, such as reconstructing the medial patellofemoral ligament in the knee and the spring or deltoid ligament in the foot [14]. In some earlier research, the peroneus longus tendon was used as the first choice for ACL autograft, with good clinical outcomes and low donor-site morbidity [10,15]. However the mortality rate of the donor-site differed from that in another study [16]. Lukman et al found no difference between the shear strengths of the hamstring tendon and the peroneus longus in their biomechanical study [17]. Keyhani et al found that ACLR with the peroneus longus tendon worked better than ACLR with the hamstring tendon [18]. In their study comparing the peroneus longus and hamstring tendons, Agarwal et al indicated that the peroneus longus can be a safe autograft [19]. Similar results were found by Saeed et al, who found that ACLR with peroneus longus allowed people to return to sports earlier [20].

We postulated that an appropriate graft for arthroscopic ACL reconstruction would be the peroneus longus tendon. Therefore, it would be especially helpful for athletes who depend on their hamstring muscles or for patients who spend a lot of their time kneeling when engaging in social or religious activities. We believed that similar knee scores could be achieved with fewer complications using the peroneus longus tendon. Therefore, this study aimed to compare outcomes of anterior cruciate ligament reconstruction in 106 patients using peroneus longus tendon and hamstring tendon autografts.

Material and Methods

GENERAL INFORMATION:

The Ethics Committee of our institution approved this study protocol (Reference 2024/E-84844131), and informed consent was obtained from all patients before participation. In this cross-sectional comparative study, 54 patients underwent anterior cruciate ligament (ACL) reconstruction with quadruple hamstring tendon autograft between 2018 and 2019, while a group of 52 patients underwent ACL reconstruction with peroneus longus tendon autograft between 2020 and 2021 (Figure 1). The same senior knee surgeon conducted all operations. The diagnosis of ACL rupture was established by the patient's medical history, physical examinations (including the Lachman test and anterior drawer test), and magnetic resonance imaging findings. The inclusion criteria were individuals ages 18–45 years who had experienced an ACL rupture. The exclusion criteria were cartilage lesions grade III or higher, prior knee surgery, revision cases, joint hypermobility syndrome, and ankle joint issues. This study was planned in accordance with the STROBE guidelines and conducted following the principles of the Helsinki Declaration.

OUTCOME MEASURES:

The functional scores assessed in the study included the International Knee Documentation Committee (IKDC) score, the Lysholm score, and knee range of motion, measured before surgery and 18 months postoperatively. Postoperative graft harvesting results were evaluated by measuring thigh circumference 15 cm proximal to the upper pole of the patella and comparing it to the contralateral healthy side in both groups. For the peroneus longus tendon group, the condition of the ankle donor-site was assessed using the American Orthopedic Foot and Ankle Score (AOFAS) and the Foot and Ankle Disability Index (FADI) score. The results were compared with the contralateral healthy ankle. All measurements and evaluations were performed by another surgeon following the same standards.

SURGICAL PROCEDURE:

All surgeries were performed by a single experienced knee surgeon. Patients were positioned supine under regional anesthesia. A tourniquet was applied to the thigh and inflated without prior elevation or exsanguination. Standard anterolateral and anteromedial portals were created. Diagnostic arthroscopy was conducted to confirm the ACL rupture, followed by harvesting of either the peroneus longus or hamstring tendon.

PERONEUS LONGUS TENDON HARVESTING:

The procedure of extracting the peroneus tendon was performed on the same-side leg. The incision site was designated at a distance of 2–3 cm above and 1 cm posterior to the lateral malleolus. The incision was made through the skin, subcutaneous tissue, and superficial fascia. The tendons of peroneus brevis and peroneus longus were recognized. The tendon division was identified 2–3 cm above the level of the lateral malleolus. The peroneus longus tendon's distal segment was sutured using an end-to-side technique. To protect the peroneal nerve, the tendon of the peroneus longus was stripped proximally with a tendon stripper to approximately 4–5 cm below the fibular head. To create a 2-strand autograft, the tendon was folded over longitudinally through the middle, and its ends were whip-stitched using a No. 2 polyester suture. Figure 2 illustrates how we harvested grafts.

HAMSTRING TENDON HARVESTING:

A 3-cm oblique skin incision was performed over the pes anserinus and anteromedial side of the proximal tibia in the hamstring group. An open tendon stripper was used to remove the gracilis and semitendinosus tendons. After that, the tendons were folded into a 4-strand hamstring graft, and a No. 2 polyester whip-stitch suture was used to secure both ends. The intra-articular surgical method remained the same: fibrous tissue was removed from the intercondylar notch to improve visibility while the tunnels were being prepared. To act as a guide for the graft insertion, ACL fibers were retained. Separate drilling was done for the tibial and femoral tunnels. To prevent graft loosening in the future, a graft tendon was implanted and tensioned by hand. The process of graft tendon fixation involves the use of bioabsorbable screws for graft fixation on the tibial side and endobutton for graft fixation on the femoral side. In Figure 3, our method for harvesting the hamstring tendon is demonstrated.

POSTOPERATIVE REHABILITATION AND FOLLOW-UP:

All patients underwent cold treatment with their knees fully extended right after surgery. On the first postoperative day, the drain was taken out, the patients were mobilized using crutches, and weight bearing was encouraged as long as it was comfortable. Patients were evaluated in the postoperative period with routine anterioposterior and lateral knee radiographs. Additional imaging was not required unless complications were present. Exercises to strengthen the quadriceps and extend the range of motion in the knee were started. Weight bearing was postponed for 4 weeks in the event of meniscus repair or microfracture, however,the range of motion was gradually increased. There was no immobilization of the ankle. Patients who were permitted to walk were permitted to bear weight. For every patient, active ankle range of movement (ROM) exercises were initiated. Follow-up sessions were scheduled for the second and sixth weeks, as well as 3, 6, 12, and 18 months after surgery. During these visits, the anterior drawer test and Lachman test were used to evaluate the graft strength of the patients. After 6 months, jogging and non-contact sports were permitted; contact activities could resume after 9–12 months if the Lachman test result was negative.

STATISTICAL ANALYSIS:

IBM SPSS Statistics 28 (IBM Corporation, Armonk, NY, USA) was utilized for data entry and analysis. Categorical data were expressed as numbers and percentages, while continuous data were presented as mean±standard deviation or median. The normality of the data distribution was assessed using the Kolmogorov-Smirnov test. For numerical data comparisons between the 2 independent groups, either the t test or the Mann-Whitney U test was employed, depending on the data distribution. Frequency data comparisons were conducted using the chi-square test or Fisher's exact test, as appropriate. All statistical tests were 2-tailed, and a P value of less than 0.05 was considered statistically significant. This threshold was applied to determine the significance of differences observed between the groups for various outcome measures, including graft characteristics, clinical outcomes, and donor-site morbidity.

Results

GRAFT CHARACTERISTICS:

The diameters and harvesting times of the grafts obtained from the patients were compared. The average diameter of the peroneus longus tendon was 8.56±0.93 mm, while the average diameter of the hamstring tendon was 7.44±0.6 mm. The peroneus longus tendon was significantly larger in diameter compared to the hamstring tendon (P<0.001). Additionally, the graft harvesting time was significantly shorter in the peroneus longus tendon group, averaging 8±2.2 minutes, compared to 12.39±2.3 minutes in the hamstring tendon group (P<0.001) (Table 2).

CLINICAL OUTCOMES:

Preoperative and last follow-up scores, as well as score changes, were analyzed for the peroneus longus and hamstring tendon groups. For the International Knee Documentation Committee (IKDC) scores, the peroneus longus group had a preoperative mean score of 55.8±3.6, which improved to 91.8±5.2 at the last follow-up, showing a score change of 35.9 (P<0.001). The hamstring group had a preoperative mean score of 56.1±4.5, which increased to 91±6.2 at the last follow-up, with a score change of 34.83 (P<0.001). The P values for the differences in IKDC scores between the 2 groups were 0.28 preoperatively and 0.49 at the last follow-up.

For the Lysholm scores, the peroneus longus group had a preoperative mean score of 62.85±3.7, which improved to 91.42±4.7 at the last follow-up, with a score change of 28.9 (P<0.001). The hamstring group had a preoperative mean score of 62.07±3.6, which increased to 91.02±5.4 at the last follow-up, resulting in a score change of 28.6 (P<0.001). The P values for the differences in Lysholm scores between the 2 groups were 0.69 preoperatively and 0.68 at the last follow-up (Table 3).

The Lachman test was used to assess the stability and flexibility of the knee. Failure was defined as any positive pivot shift test or grade III Lachman test. There were no discernible differences between the 2 groups (P=0.71); 98 individuals reported normal results on the Lachman test assessment, while 8 patients (5 in the hamstring group and 3 in the peroneus longus group) had modest laxity with a firm endpoint (Table 4).

MORBIDITY AT THE DONOR SITE AND ANKLE JOINT PERFORMANCE:

Any symptoms at the knee and ankle (pain and weakness), paresthesia at the site of the incision, and discomfort at the site of the incision that lasted for 18 months after surgery were considered donor-site morbidity. In the HT group, the rate of donor-site morbidity was significantly greater (P=0.006), with patients presenting with ongoing thigh pain or weakness despite normal knee function. During at least 18 months of follow-up, thigh hypotrophy was significantly greater in the hamstring tendon group (12.2±4.5 mm mean thigh hypotrophy in the hamstring group and 4.9±2.4 mm mean thigh hypotrophy in the peroneus longus group; P<0.001) (Table 5).

The donor ankle morbidity was assessed using the objective assessments of the ankle American Orthopedic Foot and Ankle Score (AOFAS) score and the Foot and Ankle Disability Index (FADI) score following peroneus longus harvesting. At the last follow-up, the donor's ankle had an average AOFAS score of 93.46±3.8 (Excellent=90–100 points, Good=75–89 points, Fair=60–74 points, and Poor <60 points). The score for the contralateral ankle was 97±1.8. At the donor site, the mean FADI score was 93.48±4.6, while on the contralateral healthy side it was 98.19±2.1 (Table 6). No clinical or complication-related differences were discovered, despite a statistically significant difference in the patients' scores. There were no concerns or pain related to the ankle joint's weakness, vascular or neurological issues, or any other discomforts over the ankle's donor-site. Following peroneus longus autograft transfer, none of the patients developed ankle joint dysfunction or problems participating in sports.

At the peroneus longus group donor-site, 2 patients reported mild to moderate pressure pain, paresthesia, and dysesthesia. During the first 2 weeks of treatment, 2 patients experienced mild wound discharge from an ankle incision; they were treated with daily dressing changes and oral antibiotics. One patient in the PLT group had common peroneal nerve damage, which healed after 4 months of follow-up and ongoing physiotherapy.

Discussion

The following were the study's most significant findings. Less thigh hypotrophy was observed in the peroneus longus graft group; some patients in the hamstring group experienced anterior kneeling pain, which interfered with their daily sports or religious activities; an evaluation of the functional ankle score in the peroneus longus group revealed excellent results, even after harvesting the graft from the ankle. At the 18-month follow-up, the peroneus longus autograft demonstrated a comparable functional score compared with the hamstring tendon. The graft harvesting time was significantly shorter in the peroneus longus tendon group. Additionally, we believe that the graft harvesting method was easier [21]. In the hamstring group, complications such as pain and paresthesia at the graft site were significantly more common compared to patients who underwent peroneus longus harvesting. The incisions made to harvest the graft appeared more cosmetically pleasing in the peroneus longus group.

The surgeon's preferences frequently determine the kind of harvested graft used. Preoperative autograft selection should take into account factors such as autograft size, strength, morbidity at the donor-site, availability, activity level of the patient, and lifestyle [22,23]. A suitable substitute autograft source can minimize postoperative pain and morbidity on the harvest side, as well as reduce surgical time [20]. Kerimoğlu et al observed that the peroneus longus tendon is a suitable choice for grafting in anterior cruciate ligament reconstruction (ACLR) due to the absence of any substantial postoperative complications or biomechanical disadvantages at the donor-site [24]. Quinn et al, in their systematic review, stated that the peroneus longus had appropriate graft characteristics for ACL reconstruction [25].

Keyhani et al, in a comparative study evaluating 130 patients, found that the functional scores of knees with a peroneus longus tendon graft were similar to those using the hamstring tendon [18]. They noted faster knee rehabilitation, less anteromedial knee pain, and knee hypotrophy with the peroneus longus tendon. Additionally, they found that the diameter of the peroneus longus graft was larger and there were fewer complications related to graft harvesting. Our clinical results resemble those of this study. However, in their study, there was no significant difference between patients with peroneus longus tendon grafts and those with intact ankles. In our study, patients with peroneus longus grafts had significantly lower AOFAS and FADI scores compared to the normal ankle, but this difference did not affect clinical outcomes. Using the clinical improvement scale, we found that patients' ankle functions were rated as excellent. Saeed et al found that, compared to the hamstring tendon, the peroneus longus tendon had superior graft characteristics, and patients' knee scores at 6 months of follow-up were better in the peroneus longus group. Additionally, patients who underwent ACL reconstruction with the peroneus longus tendon returned to sports 34 days earlier than those who underwent reconstruction with the hamstring tendon [20].

The literature indicates that the autograft diameter is a critical factor influencing the rate of revision and re-rupture [26]. According to recent research, graft diameters smaller than 8 mm are unacceptable [11,27]. Younger patients have a higher rate of graft failure [28]. A patient who is shorter than 149 cm will require graft augmentation since their prospective graft size is less than 7 mm [14]. A study discovered a strong positive association between a 1-mm increase in graft diameter and greater revision rates when the graft size was less than 8 mm, as well as higher KOOS and IKDC scores [27]. In their comparative investigation, Saeed et al reported that the peroneus longus tendon had an average diameter of more than 8 mm and was thicker than the hamstring tendon [20]. The peroneus longus tendon's mean diameter in the present investigation was greater than 8 mm (Table 2). Other studies have also shown comparable findings [18,21]. When the diameter of the hamstring tendon is insufficient, procedures such as quadrupling the tendon or obtaining an additional tendon from the quadriceps may be performed. This can sometimes complicate the surgical procedure. Using larger-diameter tendons can prevent the need for these procedures [18,29]. PLT fared well in our comparison of graft harvesting times. The average duration for PLT to harvest grafts was 8 minutes, a significant difference of 4.3 minutes compared to HT ($P<0.001$), which is consistent with findings from previous research [20,30]. Peroneus longus tendon (PLT) harvesting takes less time than with the hamstring tendon (HT) because of its superficial location and the relative lack of muscle tissue linked to it. Surgeons should consider this discovery because PLT may result in shorter operating times and less tiredness for the surgeon.

When selecting a graft, one of the main outcomes is donor-site morbidity. A significantly increased incidence of thigh weakness and possible thigh muscular hypotrophy was linked to use of the hamstring tendon [31]. Additionally, the hamstring muscles and the ACL tendon cooperate to prevent anterior laxity of the leg [32]. Studies by Rhatomy et al and Saeed et al found that patients who had their hamstring tendon harvested had a higher rate of donor-site morbidity than those who had their peroneus tendon harvested [15,20]. Additionally, they observed that, in contrast to the peroneus longus group, individuals who had hamstring tendon harvesting had higher incidences of thigh hypotrophy. In their study comparing hamstring and peroneus longus tendons, Agarwal et al reported that patients in the PLT group had better recovery from thigh muscle hypotrophy compared to their preoperative condition [19]. In our investigation, the group that had hamstring tendon harvesting also had greater levels of thigh hypotrophy. The peroneus longus is a recommended graft used in ACL restoration, which explains why the thigh circumferences of the injured and uninjured sites in our study were identical.

Assessments of the functional score for the ankle using American Orthopedic Foot and Ankle Score (AOFAS) and the Foot and Ankle Disability Index (FADI) scores were carried out to evaluate donor-site morbidity for peroneus longus tendon autografts. The results are displayed in Table 6. The mean AOFAS score for the donor ankle was 93.46±3.8 while the FADI score was 93.48±4.6. A statistically significant drop was detected in the scores when compared to the healthy ankle. Nevertheless, none of the patients' clinical evaluations showed this; every ankle received a clinical evaluation score of excellent. Ankles with peroneus longus tendon grafts were examined for preoperative and postoperative AOFAS and hindfoot scores in another investigation. Significantly lower postoperative values were discovered, but these patients did not exhibit clinically subpar results [20]. Research with 439 patients found that the donor's ankle had a mean AOFAS score of 97.63±3.20 and a FADI score of 98.46±2.31 [33]. A postoperative AOFAS score of 93.42 was reported by Keyhani et al [18] and did not differ substantially from the contralateral side's score. Similar clinical ankle function and an AOFAS score of 98.93 at the most recent follow-up were similarly reported by Rhatomy et al [14]. Agarwal et al also reported that there was no difference in ankle scores between the 2 groups [19]. Even though our study's scores were lower, this could be explained by the patient population's degree of participation in sports and the follow-up duration. The subjective and clinical results, however, were comparable to those of the aforementioned investigations. The aforementioned outcome demonstrates that once the peroneus longus tendon was harvested, the donor's ankle functioned flawlessly. This is most likely due to the donor ankle's peroneus brevis still being present. According to earlier research, the peroneus brevis is a more capable ankle evertor that will keep the ankle's eversion function intact once the peroneus longus tendon has been harvested [34]. Although earlier research [16,35] reported a decrease in ankle peak torque eversion and inversion, we discovered that the functional result was still quite good.

Our study's retrospective design is the main source of its limitations. Clinical results were determined bBased on patient records and responses. The results might not be transferable to broader populations because of the relatively limited sample size and follow-up duration. The study excluded patients with certain conditions (eg, cartilage lesions grade III or higher, prior knee surgery), which might affect the applicability of the results to all ACL rupture patients. All surgeries were performed by a single experienced knee surgeon, which may limit the reproducibility of the results by surgeons with different levels of expertise or using different techniques. Subjective function scores could have been associated with objective evaluations such as knee flexion and extension strength, ankle eversion, and inversion strength. Nonetheless, bias was reduced by using the same graft harvesting method, postoperative rehabilitation regimen, and a single surgeon.

Conclusions

The current study has shown that using the peroneus longus tendon as an autograft source for arthroscopic anterior cruciate ligament reconstruction is a safe and practical option. This is due to its strength, larger graft diameter, ability to maintain satisfactory ankle function, and avoidance of potential complications associated with using a hamstring autograft obtained from the knee region. Additional research with a larger sample size and a longer duration of observation is required to validate these findings and determine their practicality.

Figures

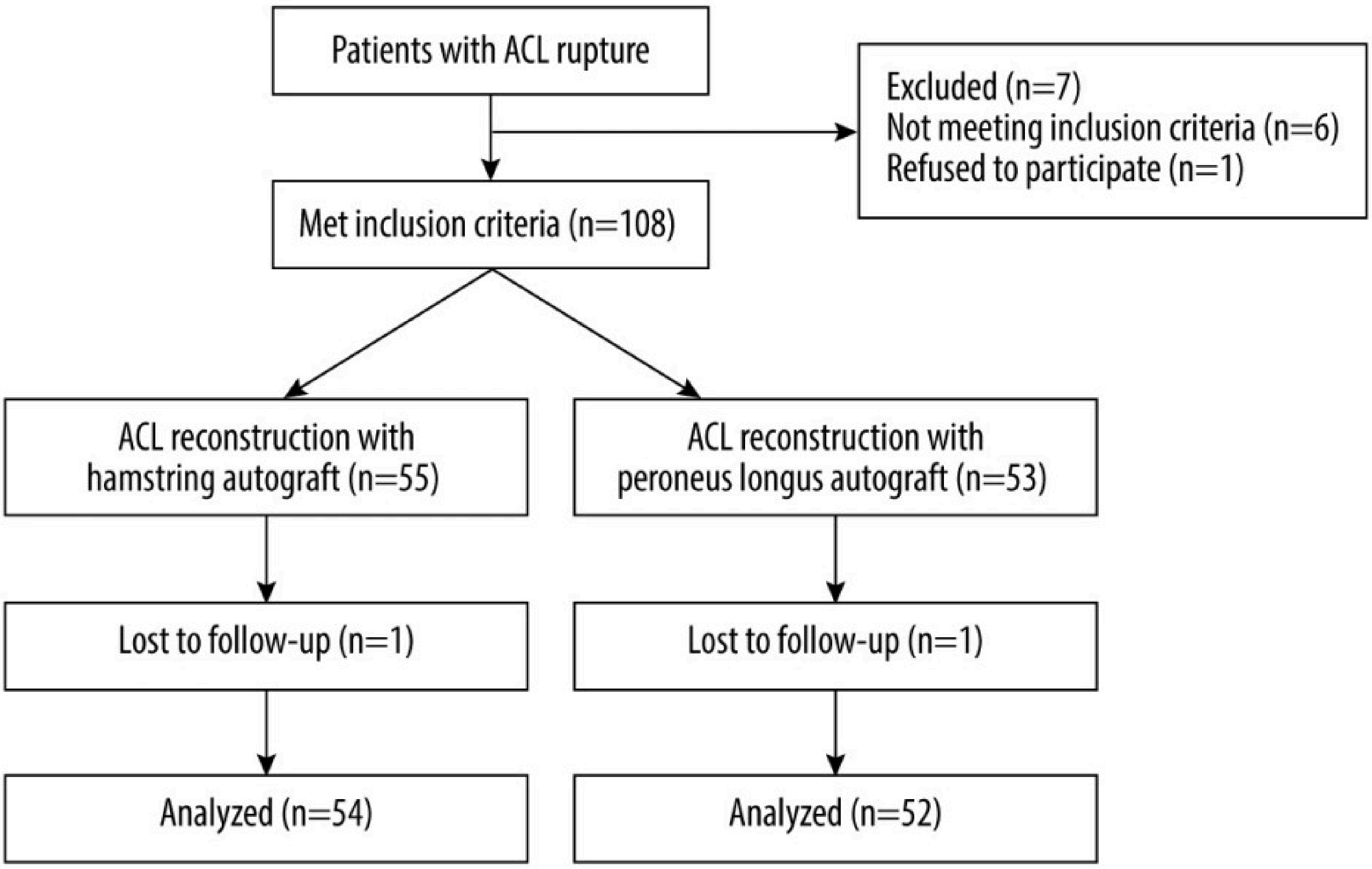

Figure 1. *Flowchart of the study. Figure 1 was created using the Microsoft Office Word program.*

Figure 2. *Our method for harvesting the peroneus longus tendon involves a very small and superficial incision, which stands out as an advantage. The photographs in Figure 2 were combined using the Paintprogram (Microsoft Office). No other software was used.*

Figure 3. *The method we used for harvesting the hamstring tendon autograft is shown. The photographs in Figure 3 were combined using the Paintprogram (Microsoft Office). No other software was used.*

Tables

Table 1. *Demographic data of the 2 groups.*

	Hamstring group	Peroneus longus group	
Age, years*	28.9±6.1	28±6.2	p=0.7
Gender			
Male/Female	46/8	47/5	p=0.4
Body mass index*	26.4±1.6	26.8±1.3	p=0.1
Side			
Right/left	38/16	35/17	p=0.7
Injury mechanism			
Sports/MVA/other	32/13/9	33/10/9	p=0.8
Injury to surgery, months*	7.1±3	7.6±3	p=0.37
Follow-up, months*	20.6 ±1.5	20.4±1.7	p=0.59
Medial meniscus tear			
Repair/partial meniscectomy	15/4	13/5	p=0.9
Lateral meniscus tear repair	3	2	

* Mean±standard deviation;
MVA – motor vehicle accident.

Table 2. *Comparison of graft diameter and harvesting time.*

	Hamstring group	PL group	Mean diffrence	P value
Graft harvesting time (min)*	12.39±2.3	8±2.2	4.3 (95% CI 3.4–5.2)	p
Graft diameter (mm)*	7.44± 0.6	8.56±0.93	1.1 (95% CI 1.4–0.8)	p

* Mean±standard deviation;
PL – peroneus longus.

Table 3. *The preoperative and postoperative IKDC and Lysholm scores of the patients.*

		Preoperative	Last follow-up	Score change	P-value
IKDC*	Peroneus longus*	55.8±3.6	91.8±5.2	35.9	
	Hamstring*	56.1±4.5	91±6.2	34.83	
	P-value	0.28	0.49		
Lysholm*	Peroneus longus	62.85±3.7	91.42±4.7	28.9	
	Hamstring	62.07±3.6	91.02±5.4	28.6	
	P-value	0.69	0.68		

* Mean±standard deviation;
IKDC – International Knee Documentation Committee.

Table 4. *Comparison of knee stability.*

Comparison of knee stability.

Table 5. *Donor-site morbidity of groups.*

	Hamstring group	Peroneus longus group	
Donor site morbidity			
No	37	47	p=0.006
Yes	17	5	
Thigh hypotrophy, mm*	12.3±2	3.7±1.1	p

* Mean±standard deviation.

Table 6. *Comparison of scores between patients' grafted and healthy ankles.*

	Contralateral ankle	Grafted ankle	P value
AOFAS score*	97.12±1.8	93.46±3.8	p
FADI score*	98.19±2.1	93.48±4.6	p

* Mean±standard deviation;
AOFAS – The American Orthopedic Foot and Ankle Score; FADI – The Foot & Ankle Disability Index.

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