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Complications of peroneus longus tendon harvesting: a retrospective review of 82 cases

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Abstract

Objective Peroneus longus tendon (PLT) has become a reliable autologous graft option for various ligament reconstructions. But there are potential risks and complications associated with its use as a graft. This retrospective study aimed to examine the complications and donor site morbidity following PLT harvesting.

Patients and methods A retrospective review was performed on an institutional digital patient database, and all patients who underwent ligament reconstruction using PLT autograft were identified. Intraoperative, early, and late complications were reviewed using digital patient notes and patients underwent a complete physical examination during their final follow-up. Ankle function was assessed using the AOFAS score, and manual ankle muscle testing was performed on both sides. Sural nerve iatrogenic injury was evaluated with a dermatomal light touch examination. Cosmetic satisfaction due to incision scar and footwear complaints were also assessed.

Results 82 patients (74 male, eight female) with a mean age of 31.9 ± 10.4 years (range, 16–66) were included in the final analysis. The mean follow-up time was 46.6 ± 30.3 months (range, 6–109). The mean AOFAS score for the donor side was 98.7 ± 3.3 (range, 87–100), and the contralateral side score was 100, with manual muscle testing graded as 5 in all movements and similar to the contralateral side. Fifteen patients (18.3%) had hypoesthesia over the dorsolateral aspect of the foot distal to the incision scar, two patients (2.4%) had hyperalgesia over the distal incision scar, and one patient (1.2%) had mild ankle instability. There were two cases (2.4%) of compartment syndrome, both of which were treated with fasciotomy and had complete regression of symptoms after 5 days. One patient (1.2%) had a transient peroneal nerve injury and foot drop that resolved in the sixth month.

Conclusions The results of this retrospective study suggest that harvesting the PLT is associated with a high rate of complications and donor site morbidity. The most common complication was hypoesthesia around the lateral side of the foot, although the ankle functions were not affected significantly. Two cases of compartment syndrome and one transient peroneal nerve injury were observed. Care should be taken while harvesting PLT autograft, and it should be kept in mind that peroneal nerve injury might occur.

Level of evidence Level IV, retrospective case series.

Keywords Anterior cruciate ligament · Peroneus longus tendon · Autograft · Complications · Donor site morbidity

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Abbreviations

ACL	Anterior cruciate ligament
ACLR	Anterior cruciate ligament reconstruction
AOFAS	American Orthopedic Foot and Ankle Society
CPN	Common peroneal nerve
FADI	Foot and Ankle Disability Index
PB	Peroneus Brevis
PCL	Posterior cruciate ligament
PLT	Peroneus longus tendon

Introduction

Although anterior cruciate ligament reconstruction is a well-established surgical procedure, many technical details, such as optimal graft selection, continue to be discussed. ACLR might be performed using a variety of autograft options. Currently, the most commonly preferred grafts are hamstring tendons, bone-patellar tendon bone, and quadriceps tendon with or without a bone block [1–3]. Although each graft option has its own advantages, there are also disadvantages and complications related to donor site morbidity [3]. To overcome these shortcomings, research on new graft options and graft harvesting techniques continue to evolve. In the search for the ideal graft for ACLR, the peroneus longus tendon (PLT) has been suggested as a favorable graft option since first described by Kerimoglu et al. in 2008 [4]. Recent evidence supports that PLT is a viable graft option that results in excellent outcomes comparable with HT in ACLR [5]. However, as with all autograft options, harvesting PLT also creates an inevitable donor site morbidity. Considering the contribution of PLT to ankle functions, the removal of this tendon might result in a functional deficit of the donor's ankle. Furthermore, the risk of iatrogenic injury to the nearby neurovascular structures during graft removal might cause significant morbidity, such as foot drop following peroneal nerve damage [4–6].

Because the PLT is a relatively new graft option, the number of studies that report the results of reconstructions performed using PLT is few, and most of these studies focused on clinical outcomes [4, 7–27] (Table 1). In many articles, donor site problems have not been presented in detail and have not been evaluated objectively. We hypothesized that complications during peroneal tendon graft harvesting are more common than already known. The purpose of this study was to determine the complications observed during and after PLT harvesting. This study focused on the complications rather than the functional outcomes.

Materials and methods

Patients and study design

A retrospective assessment of digital medical data was conducted to identify all patients whose PLT was harvested for the reconstruction of ligamentous knee injuries between January 2013 and January 2022 in the authors' institution. The institutional patient database was searched for patient charts, surgery notes, medical records, and notes taken during follow-up visits. Patients with less than six months of follow-up, patients with inadequate medical records, and those who did not finish the final follow-up were all excluded from the research. This study was carried out in accordance with the ethical standards outlined in the Helsinki Declaration of 1964 and its subsequent amendments. The institutional review board accepted the study protocol (Approval date and issue: 2023/26.01-2/4).

PLT autograft harvesting technique

Four different surgeons performed surgical procedures, and three different incision techniques were used, either single incision, two incisions, or three incisions. All surgeries were performed under general or spinal anesthesia with a thigh tourniquet and the patient in the supine position. The two-incision technique was performed according to the description reported by Kerimoglu et al. [4]. First, a 2–3 cm distal incision was made starting at the tip of the lateral malleolus, following the tendon course in an oblique fashion. After the skin incision, a meticulous blunt dissection was performed to identify the tendon sheaths while preserving the sural nerve. The tendon sheaths of both PLT and PBT were opened to expose both tendons. PLT and PBT were sutured to each other side by side with No.1 non-absorbable suture while the ankle was in a neutral position to adjust the tension of the distal part of the PLT. Then, 1 cm proximal to the tenodesis sutures, PLT was sutured with No.2 non-absorbable suture in a whip-stitch style and released. Then, a second 1–2 cm longitudinal incision was made on the tendon course, 10 cm proximal to the tip of the lateral malleolus. The PLT was exposed by opening the fascia, and the tendon was pulled up through the second incision. Finally, the tendon was harvested with a 6 or 8-mm tendon stripper, depending on the thickness of the tendon. While advancing the tendon stripper, the first assistant placed his hand approximately 10 cm distal to the head of the fibula and tried to feel the tendon stripper. As soon as the stripper was felt by the first assistant, it was not advanced beyond this level. The tendon was pulled strongly to separate it from the

Table 1 List of previous studies that used PLT autograft for various ligament reconstructions

#	Author	Year	*n*	Indication	Harvesting technique	Ankle functions	Complications
1	Kerimoglu et al	2008	29	ACLR	Two-incision Full-thickness PLT	No patient experienced ankle joint dysfunction or difficulty in sports activities	Two patients (6.9%) complained of mild to moderate pressure pain, paresthesia, and dysesthesia at the donor site
2	Zhao and Huangfu	2012	92	ACLR, PCLR, multi-ligament injuries, MPFL	One-incision AHPLT	Similar preop and postop AOFAS and FADI scores	One ankle sprain One persistent snapping sensation and weakness One crepitus in the anterior ankle 13 patients (14.1%) had hypoesthesia 9 Pressure pain over the incision 11 patients had adherence over the incision scar
3	Nazem et al	2014	15	ACLR	HT augmentation with full-thickness PLT	Similar ankle ROM Decreased ankle muscle force Similar spatiotemporal gait parameters between both sides	Not reported
4	Angthong et al	2015	24	ACLR	One-incision Full-thickness PLT	Similar preop & postop AOFAS and VAS-FA scores. Lower peak torques of eversion and inversion compared to contralateral ankle Two ankle laxity Four grade IV ankle eversion muscle strength	Two temporary ankle stiffness Five temporary bulging of proximal stumps Two temporary sural nerve injury One ankle inversion sprain
5	Chung-Ting Liu	2015	8	Half PLT augmented HT ACLR	One-incision Full-thickness PLT	Similar preop & postop FADI score Normal ankle ROM Normal ankle muscle power	None
6	Khajotia et al	2018	25	ACLR	One-incision Full-thickness PLT	Normal ankle ROM Normal ankle muscle power	2 patients had pressure pain over the incision
7	Shi et al	2018	18	ACLR	Two-incisions Full-thickness PLT	Similar muscle strength measurements between sides	Not reported
8	Mingguang Bi	2018	62	Half PLT ACLR	One-incision	Similar preop & postop AOFAS	None
9	Trung et al	2019	30	Half PLT ACLR	One-incision AHPLT	Similar preop & postop AOFAS	None
10	Kumar et al	2020	25	ACLR	One-incision Full-thickness PLT	Similar ankle ROM and manual muscle testing between sides	NR
11	Rhatomy et al	2019	24	ACLR	One-incision Full-thickness PLT	Excellent postop AOFAS and FADI score	NR
12	Ayas et al	2019	2	Patellar Tendon rupture	Two-incision Full-thickness PLT	Not reported	None
13	Setyawan et al	2019	15	PCLR	One-incision Full-thickness PLT	Excellent postop AOFAS and FADI scores	Not reported
14	Rhatomy et al	2020	75	ACLR	One-incision Full-thickness PLT	Excellent postop AOFAS and FADI scores	None

Table 1 (continued)

#	Author	Year	*n*	Indication	Harvesting technique	Ankle functions	Complications
15	Shao et al	2020	21	ACLR MPFL Scapular winging	One-incision Full-thickness PLT	Similar preop & postop AOFAS and Karlsson-Peterson score Lower ankle eversion peak force compared to the contralateral side	Two temporary ankle instability One temporary painful active ankle inversion Two slight paresthesia around the incision
16	Goyal et al	2021	37	Revision ACLR Multi-ligamentous injury		Similar ankle ROM, muscle strength, and AOFAS scores between sides	Not reported
17	Bi et al	2021	21	ACLR	One-incision AHPLT	Similar preop & postop AOFAS and FADI scores Muscle strength measurements, equal to the other side	None
18	Sahu et al	2021	63	ACLR	Not reported	Excellent AOFAS and FAAM scores	Not reported
19	Joshi et al	2021	48	ACLR	One-incision Full-thickness PLT	Excellent postop AOFAS score	One superficial infection at the graft donor site None of the patients had any neurovascular deficit
20	Rajani et al	2022	113	ACLR	One-incision Full-thickness PLT	Similar FADI between sides	Seven (6.19%) patients had pressure pain and paraesthesia
21	Singh et al	2022	30	ACLR	Single-incision AHPLT augmented HT	Similar FADI scores between sides	Not reported
22	Keyhani et al	2022	65	ACLR	One-incision Full-thickness PLT	Similar ankle ROM, AOFAS, and FADI between sides	Two pressure pain, paresthesia, and dysesthesia at the donor site There were two patients with superficial infection
23	Yadav et al	2022	1	ACLR	One-incision Full-thickness PLT	Not reported	Foot drop, recovery at 3rd month after surgical exploration
24	Lu et al	2022	25	PCLR	One-incision Full-thickness PLT	Similar preop and postop AOFAS and Maryland score	None
25	Current Study	2023	82	ACLR and Revision ACLR	One, two, or three incisions Full-thickness PLT	Similar AOFAS scores and manual muscle strength between sides	One temporary peroneal nerve injury Two compartment syndrome Fifteen hypoesthesias (Sural nerve injury) One hyperalgesia One mild ankle instability

ACLR Anterior cruciate ligament reconstruction, *PLT* peroneus longus tendon, *AHPLT* anterior half peroneus longus tendon, *AOFAS* American Orthopaedic Foot and Ankle Society, *FADI* Foot and ankle disability index, *ROM* range of motion, *PCLR* posterior cruciate ligament reconstruction, MPFL: Medial patellofemoral ligament, *VAS-FA* Visual Analogue Scale Foot and Ankle, *FAAM* The Foot and Ankle Ability Measure

muscle–tendon junction. In the single-incision technique, unlike the first incision technique, the graft was harvested by advancing the tendon stripper through the distal incision without making the proximal incision. A Tendon stripper was not used in the three-incision technique. The first and second incisions are the same as described above. The third 2-cm longitudinal incision was made on the muscle–tendon junction approximately 10 cm proximal to the second incision, the muscle–tendon junction was cut with a scalpel, and the tendon was harvested by pulling firmly, and/or dissection toward the distal direction through the third incision (Fig. 1).

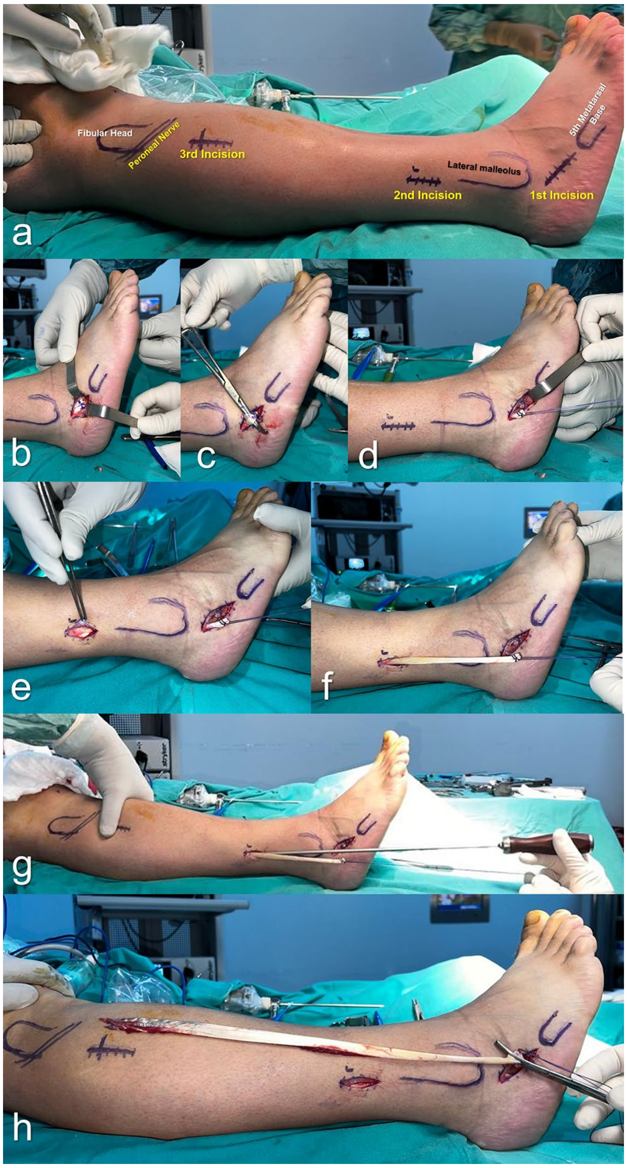

Fig. 1 PLT harvesting techniques used in this study. **a** The location of the incisions in relation to bony landmarks. **b** Both peroneal tendons are dissected, and the tendon sheaths are opened. The level of the side-to-side suture is marked with a surgical pen in ankle neutral position. **c** PLT and PBT were sutured to each other side by side with No.1 non-absorbable suture. **d** PLT was sutured with No.2 non-absorbable suture in a whipstitch style and released. **e** Then, a second 1–2 cm longitudinal incision was made on the tendon course, 10 cm proximal to the tip of the lateral malleolus. **f** The tendon was pulled up through the second incision. **g** Finally, the tendon was harvested with a 6- or 8-mm tendon stripper, depending on the thickness of the tendon. While advancing the tendon stripper, the first assistant placed his hand approximately 10 cm distal to the head of the fibula and tried to feel the tendon stripper. As soon as the stripper was felt by the first assistant, it was not advanced beyond this level. **h** The final harvested tendon and its relation to the incisions and the bony landmarks

Outcome measures

Ankle functions were evaluated using AOFAS ankle-hindfoot scale on both sides [28]. Manual muscle testing was performed with the patient lying supine position with hip and knee extended. Ankle plantar flexion, dorsal flexion, and eversion strength were tested on both sides comparatively. Muscular strength was graded following the Medical Research Council muscle strength score methodology [29]. Sural nerve dermatomal examination (light touch) was performed using a cotton pad. Patients with hypoesthesia were asked how it affected their daily life, using a 5-point Likert scale as (1) none, (2) very mild, (3) mild, (4) moderate, and (5) severe. Subjective cosmetic outcomes about incision scars were asked of the patients. Satisfaction was rated using a 5-point Likert scale as (1) not at all satisfied, (2) slightly satisfied, (3) moderately satisfied, (4) very satisfied, and (5) completely satisfied. Patients were questioned regarding footwear comfort and alterations of footwear selections following the operation. Furthermore, all postoperative complications were reviewed and recorded.

Statistical analysis

The frequency distribution, percentage, mean, standard deviation, and range were used to present descriptive data. The Kolmogorov–Smirnov test was used to determine normality. The paired sample *t* test was used to compare the AOFAS ankle-hindfoot scale and the manual muscle testing grade between the sides. A 0.05 *p* value was regarded as statistically significant.

Results

During the study period, a total of 94 patients were identified who underwent ACLR with PLT autograft. However, eight patients were lost in the follow-up, and four patients refused to participate; thus, 82 patients who completed the final follow-up were included in the study. There were eight female and 74 male patients with a mean age of 31.9 ± 10.4 years (range, 16–66). The mean follow-up time was 46.6 ± 30.3 months (range, 6–109). 61 (74.4%) patients underwent primary ACLR, and the remaining 21 (25.6%) patients underwent revision ACLR. The single-incision technique was used in 11 (13.4%) patients, the two-incision technique in 45 (54.9%) patients, and the three-incision technique in 26 (31.7%) patients. The mean graft thickness was 8.16 ± 0.7 (range, 7–10), and there was no significant difference between incision techniques (*p*: 0.780).

The mean AOFAS score on the donor side was 98.7 ± 3.3 (range, 87–100). The contralateral side AOFAS score was 100 points in all patients. Manual muscle testing on the donor side was graded as 5 in all tested movements (maximal resistance), similar to the contralateral side. However, one of our patients had occasional mild ankle instability complaints, despite having an AOFAS score of 100, full muscle strength, and full ankle range of motion.

A total of 21 complications were observed, 18 of which were minor and three major (Table 2). Fifteen patients had hypoesthesia over the dorsolateral aspect of the foot distal to the incision scar. Three of them reported complete recovery of the hypoesthesia within the first month. Only one of the remaining 12 patients reported hypoesthesia mildly affecting their daily lives. Two patients had hyperalgesia over the incision scar without hypoesthesia. One of the patients with hyperalgesia complained of occasional discomfort with shoe-wearing, particularly with certain hard-molded shoes. 76 patients (92.7%) were completely satisfied with the incision scar, 3 (3.7%) patients were very satisfied, one (1.2%) patient was moderately satisfied, and 2 (2.4%) patients were slightly satisfied. One of the slightly satisfied patients had a fasciotomy, and he was compliant with the large longitudinal fasciotomy scar rather than the incision used for the PLT harvesting.

In two patients, compartment syndrome developed on the first postoperative day and in the other on the second postoperative day. Both patients were treated with fasciotomy. In both patients, the fasciotomy was closed primarily on the 5th day with complete regression of symptoms. In one patient, the drop foot and hypoesthesia over the dorsum of the foot were observed immediately after the resolution of spinal anesthesia. To rule out complete transection of the peroneal nerve while utilizing the tendon stripper, the nerve was surgically explored. Although the nerve was anatomically intact, a decompression was performed. The symptoms completely recovered at the end of the sixth-month follow-up. None of the patients had superficial or deep wound infections at the harvesting site.

Both compartment syndrome cases and transient peroneal nerve injury occurred with the two-incision technique. However, overall complications were equally distributed among incision techniques (Table 3).

Table 2 Frequency of complications

Complications	Frequency	Percent (%)
Minor	18	21.9
Hyperalgesia	2	2.4
Hypoesthesia	15	18.3
Mild instability	1	1.2
Major	3	3.6
Peroneal nerve injury	1	1.2
Compartment syndrome	2	2.4
Total	21	25.6

Discussion

The current study investigated complications arising from PLT harvesting and donor site morbidity. Three major (3.6%) and 18 minor (21.9%) complications were seen. The most common complication was an iatrogenic injury to the sural nerve distal fibers. Approximately one out of five patients (18.3%) had symptoms of sural nerve injury. Since the sural nerve is a pure sensory nerve that provides cutaneous innervation to the skin on the lateral side of the foot, hypoesthesia distal to the incision was observed. However, it was well tolerated, and only one patient complained of interference with daily life. Most of the patients were satisfied from the cosmetic point of view as the incision scars were probably covered with shoes and socks. The findings of our study showed that PLT harvesting does not affect ankle functions. Limitations of ankle range of motion (ROM), reduced muscle strength, and deformity were not seen in any patients. The functional scores were almost similar to the contralateral side, with a negligible decline. Besides these minor complications, three significant undesired complications were seen.

Table 3 Distribution of complications among incision techniques

Complications	Single-incision (*n*: 11)	Two-incision (*n*: 45)	Three-incision (*n*: 26)	*p* value
None	9	31	21	0.929*
Hyperalgesia	0	1	1	
Hypoesthesia	2	9	4	
PN Injury	0	1	0	
Compartment syndrome	0	2	0	
Mild ankle instability	0	1	0	
Total complications within the group (%)	2/11 (18.2%)	14/45 (28.9%)	5/26 (19.2%)	0.577*

PN peroneal nerve

*Chi-square test

Iatrogenic peroneal nerve injury is a debilitating complication that can result in permanent disability and may require secondary interventions. The tendon stripper is a sharp surgical instrument, and tendon removal is a blinded procedure. Nerve injury with a tendon stripper is a well-known complication of saphenous nerve injury during hamstring tendon harvesting [30]. However, peroneal nerve injury following PLT has only been reported once in the current literature. Yadav et al. presented a case of foot drop in a 25-year-old patient after ACLR using PLT autograft [6]. Similar to our case, a complete transection was not observed during the surgical exploration, but an intraneural hematoma was formed. Two cadaver studies examined the risk of peroneal nerve injury during PLT tendon harvesting. He et al. harvested PLT in 10 fresh-frozen cadavers using a single-incision technique with a tendon stripper [31]. The tip of the tendon stripper was 52.9 ± 11.4 mm away from the deep peroneal nerve, 29.3 ± 4.2 mm away from the PLT branch of the peroneal nerve and 5.2 ± 0.7 mm away from the superficial peroneal nerve. They reported that this technique has a low to moderate risk of peroneal injury since no transection injury was observed in any of the 10 legs. Another cadaver study conducted by the same research group investigated whether these distances change with knee position [32]. It has been reported that the distance between the tip of the tendon stripper and the peroneal nerve did not change in knee flexion and extension. Although safe distances have been reported in these cadaver studies, it should be kept in mind that anatomical variations of the peroneal nerve and its terminal branches may exist. Three different compartment locations of the superficial peroneal nerve were described in a meta-analysis study conducted by Correia et al. [33]. For this reason, care should be taken while advancing the tendon stripper proximally close to the fibular head. As a safety precaution, an assistant can feel the tip of the tendon stripper approximately 10 cm (four fingers) distal from the fibular head. In addition, the three-incision technique described here might be a safer option as tendon strippers were not used. In the literature, PLT harvesting techniques vary considerably in terms of incision locations among studies. Further cadaver and clinical studies are needed to establish the standards harvesting technique.

The sural nerve is in close proximity to the peroneal tendons around the ankle. Iatrogenic sural nerve injuries have been reported between 0 and 14.1% in the current literature. On the other hand, sural nerve injuries were observed more frequently (20.7%) in this series. The reason behind the higher complication rate might be related to the location of the distal incision. As the sural nerve travels through the calf, it divides into numerous terminal branches at the ankle joint level [34]. Distal to the lateral malleolus, the likelihood of injury to these thin terminal branches increases. In the original two-incision technique described by Kerimoglu et al., the first incision was made below the lateral malleolus [4]. Conversely, in the single-incision technique used by Zhoa et al., the incision was made 2 cm above the lateral malleolus, where the sural nerve still exists as a single thick bundle [7]. Moreover, He et al. reported that the mean distance between the PLT and the sural nerve was 4.9 mm at the tip of the lateral malleolus, 8.3 mm at 1 cm proximal, 10.8 mm at 2 cm proximal and 11.5 mm at 3 cm proximal in their cadaver study [31]. Thus, moving the incision distally, sural nerve injury might increase as the distance between the nerve and the tendons shortens. Since we applied the original technique, a higher frequency of sural nerve injury might be explained in light of this knowledge. On the other hand, it is possible to obtain a thicker graft when the PLT tendon is released more distally. Since there is an inverse relationship between graft thickness and re-rupture, harvesting PLT from a distal incision seems more reasonable [35]. Five previous studies investigated the relationship between graft thickness and anthropometric parameters [36–40]. In four of these studies, graft harvesting was performed with a single incision 2 cm above the tip of the lateral malleolus; the minimum graft thickness was 7 mm, which is accepted as the lower limit of an appropriate graft that prevents re-rupture. However, Khan et al. reported a minimum graft thickness of 8.5 mm with a two-incision technique where the distal incision was located 4 cm proximal to the fifth metatarsal base [40]. Regardless of which incisional location is preferred, blunt dissection and preservation of sural nerve branches within the incision line will reduce the possibility of transection of the nerve and consequent hypoesthesia. Two patients in our series had complaints of hyperalgesia. This indicates that there is also the possibility of sural nerve neuroma. Similarly, several authors reported pressure pain over the incision scars.

The development of compartment syndrome in two of our cases is the second major complication of PLT tendon harvesting. This complication has not been reported in the literature before. Although small incisions are made through the fascia, this complication may occur in patients who develop excessive bleeding into the anterolateral compartment of the cruris. Probably the terminal branches of the fibular artery that supply the peroneal muscles were damaged with the tendon stripper resulting in increased intra-compartmental pressure due to bleeding. Symptoms appeared on the first postoperative day in one patient and on the second postoperative day in another. Thus, we recommend close follow-up of patients in the postoperative period. Using intravenous tranexamic acid (TXA) might be a helpful strategy to reduce bleeding. In the metanalysis study conducted by Goldstein et al., it was reported that TXA use reduces hemarthrosis, bleeding into the drain, and overall complications in ACLR [41].

The PLT is the most powerful evertor muscle of the ankle, working as an antagonist of the anterior tibialis muscle. It also acts as the dynamic stabilizer of the ankle [42]. The development of ankle instability in peroneal tendon ruptures has been reported in previous studies [43, 44]. Theoretically, it can be assumed that PLT tendon removal will give rise to the loss of these functions and cause loss of ankle eversion strength or lateral instability. However, the side-by-side tenodesis of the peroneus longus and brevis tendons ensures that the PB tendon compensates for these functions. No loss of muscle strength was observed in any patient in our series. However, the manual muscle strength testing overshadows the objectivity of the assessments. Some studies objectively measure ankle muscle strength, but conflicting findings have been reported in these studies [8, 11, 17, 21]. In two studies, eversion and inversion peak torques during isokinetic testing were substantially lower on the donor ankle than on the contralateral ankle [8, 17], whereas other studies reported comparable eversion strengths on both sides, despite a slight decline [11, 21]. Furthermore, Nazem et al. reported no difference between spatiotemporal gait parameters between the two sides [27]. When functional ankle scores were examined, an insignificant decrease in functional ankle scores was reported by several authors, including AOFAS or FADI [7, 9, 12, 14, 15, 17, 21, 22, 24–26]. It appears that subtle muscle strength losses do not effectively alter the overall functional outcomes. In their meta-analysis, He et al. reported a statistically significant but clinically insignificant decrease in preoperative and postoperative AOFAS scores. The authors emphasized that it is more important to prevent the Quadriceps-Hamstring disparity that occurs with hamstring tendon harvesting [5]. In addition, Kerimoğlu et al. have shown the regeneration capacity of PLT through magnetic resonance imaging late after removal [45]. Therefore, the timing of assessments might be important. The difference between the two ankles may gradually decrease due to the regeneration of the tendon and the development of compensatory mechanisms. In light of the above-mentioned information, it can be concluded that taking PLT does not cause a significant change in ankle functions.

This study has some strengths and weaknesses. First, data were collected retrospectively, but all patients completed their final follow-up examinations. The number of patients is relatively high compared to similar articles in the literature. Manual muscle strength examinations can be considered as another limitation. Finally, the surgeries were performed by different surgeons, and that different incision techniques were used.

Conclusions

As a result, harvesting PLT is not a completely safe procedure, and minor or major complications may occur. The most common minor complication is a sural nerve injury that leads to hypoesthesia over the dorsolateral aspect of the foot. A meticulous dissection should be performed to protect the sural nerve branches during the distal incision. In order to avoid peroneal nerve damage, care should be taken while advancing the tendon stripper proximally, particularly approaching the level of the fibular neck. Surgeons should also be alert for possible compartment syndrome, and close postoperative follow-up should be done. In general, it can be concluded that harvesting PLT does not impair the overall functions of the ankle. However, due to the high rate of minor and major complications, meticulous care should be taken when harvesting PLT autograft, and it should be used in the absence of other graft options.

Author contributions Study conception and design: AC, OK, HS. Acquisition of data: HS, OFE, ET, FD. Analysis and interpretation of data: OK, ET, AC. Drafting of the manuscript: OK, AC, ET, OFE, HS, FD. Critical revision: OK, AC, ET, HS, OFE, FD (Initials of authors' names).

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Data availability The data used in this study is available on reasonable request from the authors.

Declarations

Conflict of interest Authors have no conflict of interest to declare.

Ethical approval Institutional Review Board approved the study protocol (Date/Issue: 2023/26.01-2/4).

Informed consent Written informed consent was provided by the participants.

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