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Letter to Editor

Influence of peroneus longus tendon autograft for ACL reconstruction on donor-side ankle function in obese patients: A retrospective study of 87 patients

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Anterior cruciate ligament reconstruction

To the Editor,

In recent years, an increasing number of surgeons have focused on the peroneus longus tendon (PLT) for anterior cruciate ligament (ACL) reconstruction, due to its advantages of easy harvesting, satisfactory biomechanics, and avoiding secondary injury to the involved site.[1,2] As the largest weight-bearing joint in the human body, the weight-bearing load of the ankle joint increases with increasing body weight. However, the influence of body mass index (BMI) on ankle joint function after PLT autotransplantation was rarely discussed. Therefore, the effects of BMI on ankle function after ACL reconstruction with autologous PLT were investigated in this retrospective study, which would provide a reference for clinicians to formulate treatment plans, and give accurate answers to patients—especially obese ones—after consultation.

Data were collected from 87 cases of unilateral ACL reconstruction under knee arthroscopy between January 2018 and January 2022 (the surgical procedure is provided in Fig. 1). Patient sex, age, perioperative height, weight, laterality, operation duration, intraoperative apparent blood loss, postoperative complications were collected. Height, weight, ankle function score (Numeric Rating Scale [NRS] score, American Orthopedic Foot and Ankle Society [AOFAS] score, Maryland foot score), and knee joint score (Lysholm knee score) were collected during outpatient visits, rehospitalizations, and telephone at 12 months postoperatively.

Body height and weight were measured, and BMI was calculated (BMI = weight [kg]/height^2 [m^2]). Patients were divided into normal weight (group A, BMI = 18.5–23.9 kg/m^2), overweight (group B, BMI = 24–27.9 kg/m^2), and obese (group C, BMI $\geq$28 kg/m^2) groups. There was no significant difference in BMI change during the perioperative period and follow-up among the three groups ($P > 0.05$).

There were no significant differences in general characteristics, operation duration, intraoperative apparent blood loss, NRS, Maryland foot and Lysholm knee scores, but the AOFAS score of obese patients was significantly lower than those with normal BMI and overweight ($P < 0.001$) (Table 1).

The AOFAS is a scale to assess the functional recovery of the ankle after surgery, with higher scores indicating better ankle function. This study is the first to demonstrate that PLT autograft has no significant effect on the AOFAS score of the donor's ankle after ACL reconstruction in patients with normal BMI and overweight, while the AOFAS score of obese patients decreases significantly. We propose that decreased ankle stability,[3] joint range of motion hindered by fat accumulation,[4] and decreased training motivation[5] contribute to the decreased AOFAS scores in patients with high BMI. Therefore, autologous PLT should be carefully selected when selecting grafts for ACL reconstruction in obese patients.

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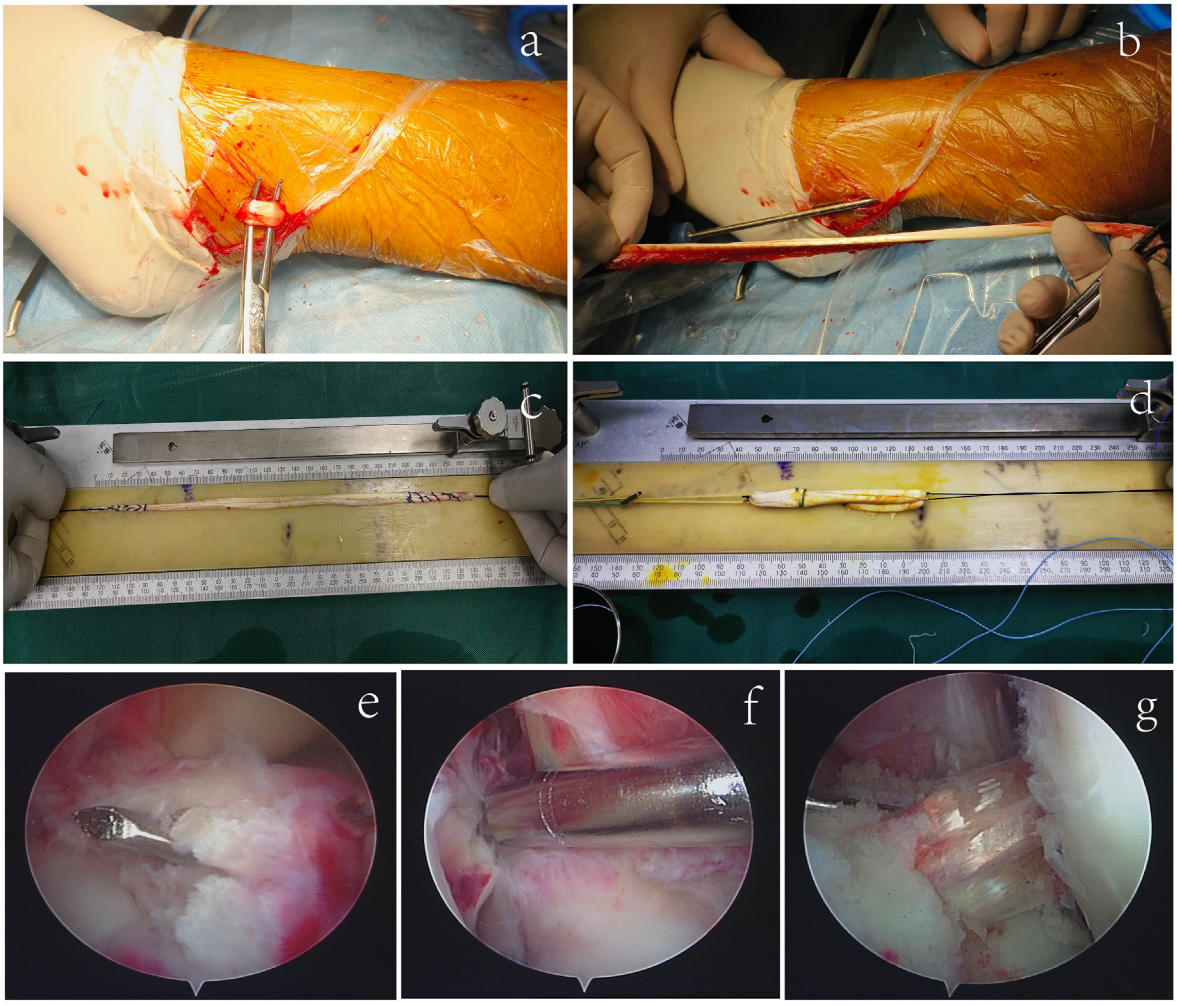

Fig. 1. a–d: procedure for removal of the peroneus longus tendon, e–g: procedure for implanting graft. a: dissection of the peroneus longus tendon; b: the removed peroneus longus tendon; c: the peroneus longus tendon was cleared of fat and muscle tissue; d: the braided peroneus longus tendon; e: establishment of a bony tunnel on the tibia side; f: establishment of a bony tunnel on the femoral side; g: reconstructed anterior cruciate ligament visualized under arthroscopy.

Table 1
General perioperative characteristics of the three groups of patients.

	group A	group B	group C	F/α value	P value
Age (years)	32.61 ± 12.41	36.48 ± 13.25	32.53 ± 9.46	0.964	0.386
Sex				2.916	0.240
men	23 (26.44%)	17 (19.54%)	15 (17.24%)		
women	18 (20.69%)	10 (11.49%)	4 (4.60%)		
Laterality				0.556	0.753
left	25 (28.74%)	14 (16.09%)	11 (12.64%)		
right	16 (18.39%)	13 (14.94%)	8 (9.20%)		
Causes of injury				0.506	0.989
sports	31 (35.63%)	22 (25.29%)	15 (17.24%)		
traffic accidents	7 (8.05%)	4 (4.60%)	3 (3.45%)		
others	3 (3.45%)	1 (1.45%)	1 (1.45%)		
Mean diameter of grafts (mm)	0.77 ± 0.07	0.83 ± 0.08	0.86 ± 0.08	9.119	<0.001[a]
Operation duration (min)	135.85 ± 43.75	144.81 ± 55.25	144.21 ± 45.13	0.36	0.699
Intraoperative apparent blood loss (ml)	13.54 ± 15.22	13.15 ± 9.11	20.26 ± 16.37	1.82	0.168
NRS scores	0.44 ± 0.67	0.56 ± 0.70	0.74 ± 0.81	1.15	0.322
Maryland Foot scores	93.63 ± 2.71	93.70 ± 3.67	92.21 ± 2.95	1.65	0.199
AOFAS scores	94.61 ± 3.48	94.00 ± 3.92	89.47 ± 3.37	13.39	<0.001[b]
Lysholm scores	96.56 ± 1.91	95.48 ± 3.11	95.53 ± 2.37	2.06	0.134

Notes: group A: normal weight group, group B: overweight group, group C: obese group.
NRS: Numeric Rating Scale; AOFAS: American Orthopedic Foot and Ankle Society.
[a] The mean diameter of grafts in groups B and C was significantly larger than that in group A.
[b] The AOFAS scores of group C was significantly lower than those of groups A and B.

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Declaration of competing interest

The authors declare no conflict of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.asjsur.2023.07.041.

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