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Bone-Patellar Tendon- Bone (BPTB) Allografts Are Safe And Effective Grafts For ACL One-Stage Revision: A Consecutive Series Of 38 Patients With At Least 2 Years Follow-Up

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Faculty Disclosure Information

- Nothing to disclosure

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Introduction

- ACL rupture is one of the most common sports knee injury with rising incidence in young athletes[1]
- Reconstruction with autografts is first choice in active patients
- Failure rate of primary ACLR reported up to 13%[2]
- In young patients and in those complaining instability revision is strongly recommended
- The big issue is the graft choice in revision

Materials and methods

- Single center retrospective study in a University Hospital (IRCCS Fondazione S. Gerardo dei Tintori, Monza, Italy)
- ACL one-stage revisions with BPTB allografts
- Questionnaire via email and clinical assessment
- Patient's history and injury characteristics, Tegner activity scale, time to RTS, post-op complications, PROMs (IKDC, Lysholm, SKV)

Materials and methods

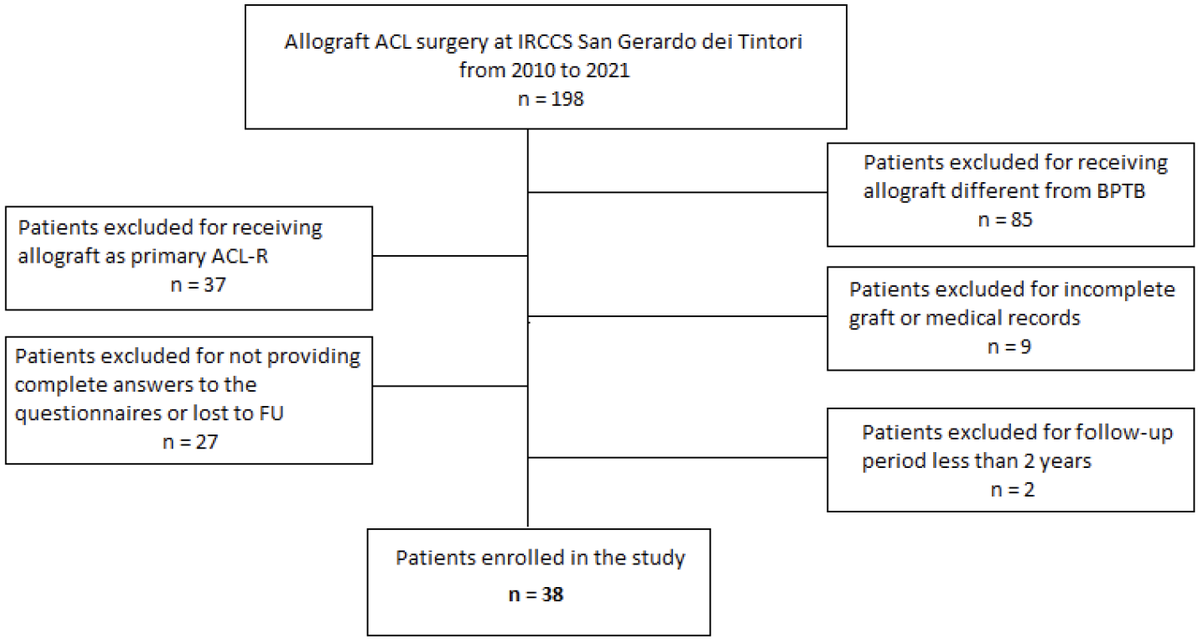
Inclusion criteria:

- ACL one stage revision with allograft
- BPTB allograft
- Age 18-50
- Minimum 2 years followup
- Complete medical and graft records

Exclusion criteria:

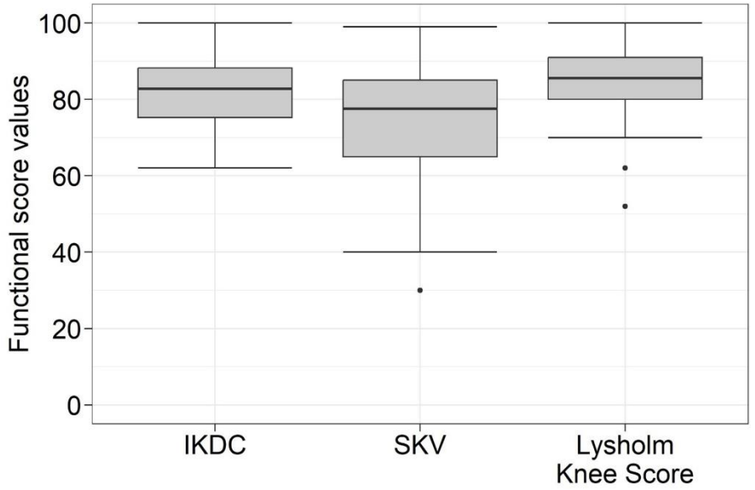
- Multiligament (PCL, PLC, PMC, MCL)
- Allograft other than BPTB
- Skeletally immature
- F.U. shorter than 2 years
- Incomplete records

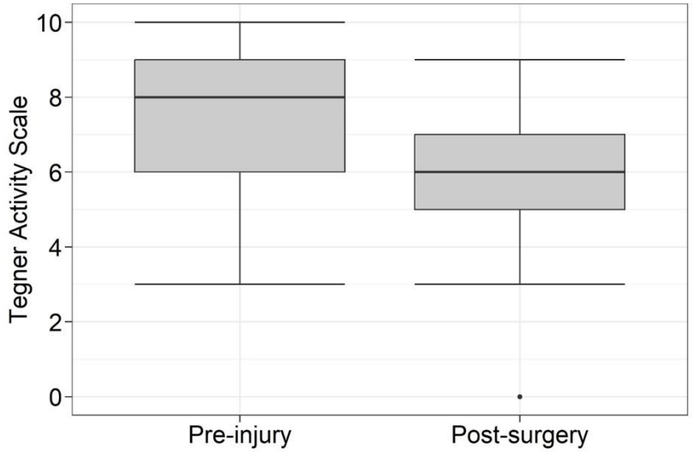
Results



	Total (N=38)
Patients characteristics	
Gender, N (%)	
Male	33 (86.8)
Female	5 (13.2)
Age at surgery (years), median (Q1-Q3)	26.1 (23.1-34.7)
Follow-up time (years), median (Q1-Q3)	5.0 (4.1-6.8)
Weight (kg), median (Q1-Q3)	74.0 (70.0-81.8)
Height (cm), median (Q1-Q3)	179.5 (172.8-183.8)
BMI (kg/m^2), median (Q1-Q3)	23.5 (21.8-24.7)
Firs Implant Graft, N (%)	
BPTB	28 (73.7)
semitendinosus + gracilis	3 (7.9)
semitendinosus alone	6 (15.8)
LARS	1 (2.6)
First surgery, N (%)	
Isolated ACLR	29 (76.3)
ACLR combined with meniscectomy	7 (18.5)
ACLR combined with chondral shaving	1 (2.6)
ACLR combined with medial meniscus suture	1 (2.6)

Results





	Re-rupture (N=4)	No re-rupture (N=34)	p-value
Patients characteristics			
Gender, N (%)			0.446
Male	3 (75.0)	30 (88.2)	
Female	1 (25.0)	4 (11.8)	
Age at surgery (years), median (Q1-Q3)	23.1 (22.4-24.3)	26.8 (23.3-35.5)	0.013
Weight (kg), median (Q1-Q3)	71.0 (66.8-76.0)	75.5 (70.0-81.8)	0.493
Height (cm), median (Q1-Q3)	174.0 (166.5-179.3)	180.0 (175.0-184.8)	0.301
BMI (kg/m^2), median (Q1-Q3)	23.8 (22.9-25.1)	23.5 (21.8-24.7)	0.781
Time from injury to surgery (months), median (Q1-Q3)	12.0 (7.4-19.4)	12.8 (6.6-21.8)	0.876
Donors characteristics			
Gender, N (%)			0.651
Male	3 (75.0)	28 (82.4)	
Female	1 (25.0)	6 (17.6)	
Age (years), median (Q1-Q3)	41.0 (32.8-49.8)	49.0 (41.0-52.8)	0.530

Discussion

Why an allograft?

- To avoid further harming the knee (or contralateral) with new harvesting
- Reducing morbidity not having a donor site
- Using a new autograft is an additional disruption to a knee already undegone harvest and surgery[3,4]

Discussion

Why BPTB allograft?

- Revisions ACL often place the surgeon in front of enlarged tunnels and bone defects
- Being stored as entire extensor apparatus, BPTB allows to tailor bone plugs
- Big bone blocks are crucial to fullfil bony gaps from previous tunnels, making it easier to perform a one-stage revision, preventing from the need of an intermediate stage of bone filling (further surgery, further time to RTS)
- Soft-tissue allografts are unlikely to be predictable as a size and do not allow for large diameters

Discussion

Is it safe?

- From our datas 6 cases out of 38 reported surgical/post surgical complications
- All cases were trivial complications, intended not to modify the outcome
- No donor site morbidity risk and no case of infection
- 4 cases out of 38 of rerupture…statistically younger. Consider LET/ALL reconstruction

Discussion

Is it effective?

- From our datas PROMs at median 5 years are reported to be good
- IKDC 82.8/100, SKV 77.5/100, Lysholm 85.5/100
- RTS within 9 months for 54%, within 12 months 74%
- Tegner after revision 6/10 (from 8/10)

Conclusions

- BPTB allografts in ACL revision surgery appears to be safe and effective option, yielding to good mid-term results in RTS and function
- Great advantage in not-harming the knee with a new harvest
- Bone-blocks allow bone-to-bone healing and gaining higher diameters, avoiding 2-stage surgery
- ALL procedures should be considered in the setting of a revision, above all in younger patients

References

1. Maheshwer B, et al. Anterior Cruciate Ligament Tears in the Adolescent Population: Injury Demographics and Risk of Reinjury Among High School Athletes. J Pediatr Orthop 2023;43:591–7.

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