

Hamstring Tendon Autograft Vs. Tibialis Tendon Allograft for ACL Reconstruction: A Critically Appraised Topic



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SCIENCES

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INTRODUCTION

ACL injuries are extremely common especially in the young and active population. ACL tears require reconstruction surgery with the use of either an autograft or allograft. The purpose of this research is to find whether a hamstring autograft or tibialis allograft provides these patients with longer survivorship.

CLINICAL QUESTION

Does a hamstring tendon autograft or tibialis tendon allograft provide superior outcomes in regards to re-injury rates and subjective functional outcome scores following an ACL tear in patients under the age of 35?

METHODS

Four relevant studies were chosen based on inclusion and exclusion criteria, three prospective randomized studies and one retrospective clinical study.

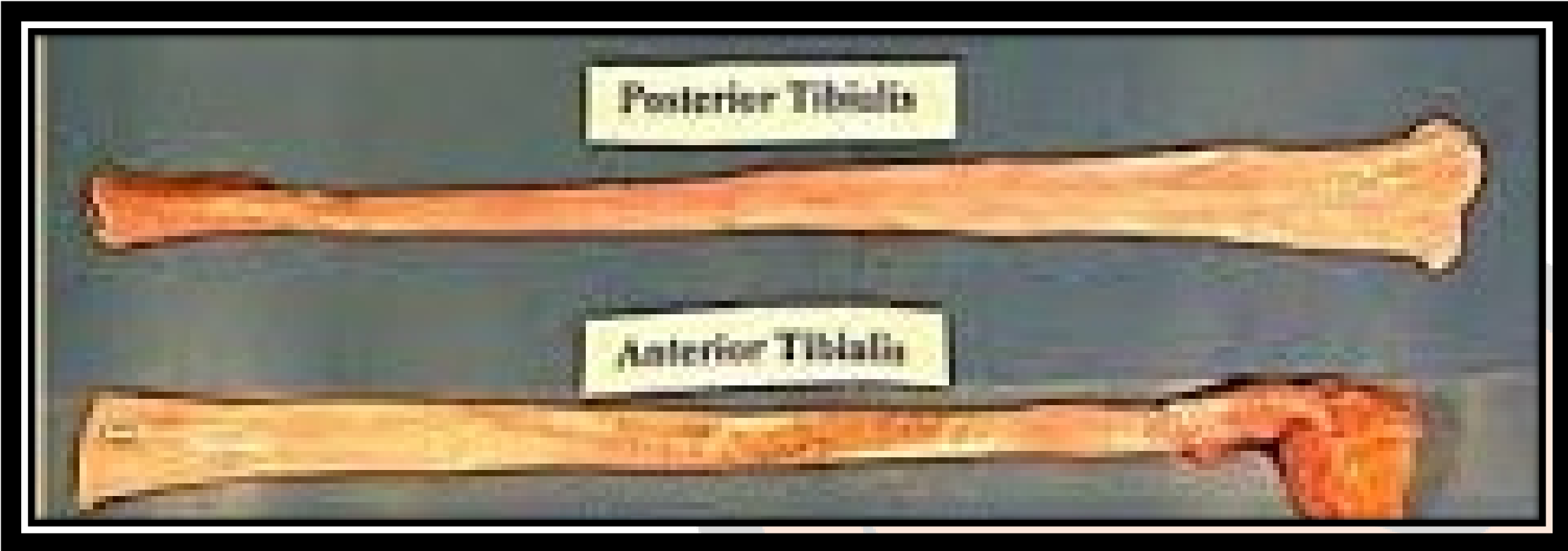
STUDY DESIGN

Critically Appraised Topic

Table 1

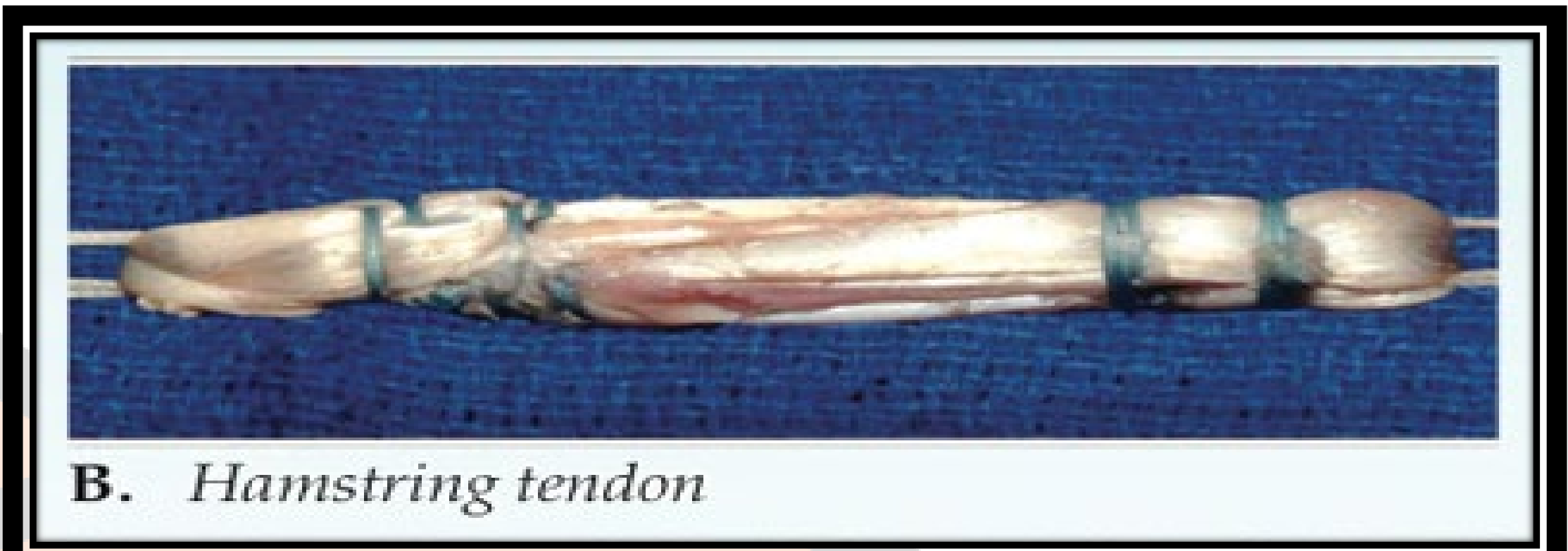
	Lawhorn, K. et al	Kaeding, C. et al	Issin, A. et al	Bottoni, C. et al
Patient Population Demographics	102 Patients: 54 Hamstring autograft 48 Anterior Tibialis allograft Mean age: 33.5 (16-53)	281 Patients: 123 Hamstring autograft 158 Tibialis tendon allograft Mean age: 27.8 (10-40)	63 Patients: 27 Hamstring autograft 36 Anterior Tibialis allograft Mean age: 27 (16-49)	97 Patients: 48 Hamstring autograft 49 Posterior Tibialis allograft Mean age: 29 (20-42)
Study Design	Prospective randomized study	Prospective cohort study	Retrospective clinical study	Prospective randomized clinical study
Level of evidence	Level II	Level II	Level III	Level I
Intervention	Hamstring autograft Anterior Tibialis Allograft Minimum 2 year follow-up	Hamstring autograft Tibialis tendon allograft Minimum 2 year follow-up	Hamstring autograft Anterior Tibialis allograft Minimum 2 year follow-up	Hamstring autograft Posterior Tibialis allograft Minimum 10 year follow-up
Outcome Measures	Radiographs IKDC subjective and functional scores KT testing Pivot shift Subjective questioning ROM Presence of effusion Thigh circumference Harvest-site symptoms Functional outcome determined by hop test	Graft failure and Marx activity score	Tegner activity scale Lysholm knee score KT-2000 arthrometer for anterior laxity	Graft failure Single assessment numeric evaluation Tegner or IKDC score
Results Key Findings	The use of fresh frozen anterior tibialis allograft for ACLR produced similar subjective and functional outcomes at 24 months minimal follow-up compared with patients undergoing ACLR with hamstring tendon autografts. No statistical differences were noted between the 2 groups for any of the measured dependent variables at the latest follow-up.	There is an increased risk of ACL graft rupture in patients who have undergone allograft reconstruction. Younger patients also have an increased risk of ACL graft failure. The odds of tearing an ACL graft was significantly higher for the allograft group compared to the autograft group regardless of age (P=0.04). Increasing a patients age by 10 years confers a 43% reduction in the odds of ACL rupture (P<0.01).	Primary ACLR with a single loop freeze-dried irradiated tibialis anterior allograft revealed comparable results with four-strand hamstring autograft in non-athlete patients There was a significant difference in the improvement of Tegner activity scores for the hamstring group compared to the tibialis group. (P < 0.05)	At a minimum of 10 years after ACLR in a young athletic population over 80% of all grafts were intact and had maintained stability. However those patients who had an allograft failed at a significantly higher rate than those with an autograft (P = 0.03). No difference in in the subjective outcome scores Of the 17 graft failures 13 were allografts (26.5%) and 4 (8.3%) were autografts

Tibialis Tendons



Allograft Tendons.
https://cdn.ymaws.com/www.aoasm.org/resource/resmgr/2015_Clinical_Conference/April_22/Marchetto_Allograft.pdf. Accessed January 17, 2019.

Hamstring Tendons



Common Allografts.
https://cdn.ymaws.com/www.aoasm.org/resource/resmgr/2015_Clinical_Conference/April_22/Marchetto_Allograft.pdf. Accessed January 17, 2019

RESULTS

Hamstring tendon autografts and tibialis tendon allografts provide similar subjective and functional outcomes. The odds of tearing an ACL graft was significantly higher for the allograft group compared to the autograft group regardless of age.

CONCLUSION

There is reasonable evidence to support that the hamstrings autograft has superior survivorship compared to tibialis allografts and should therefore be the first choice for a young and athletic population.

STRENGTH OF RECOMMENDATION

Level B

REFERENCES

1. Bottoni C, Smith E, Shaha J, et al. Autograft versus allograft anterior cruciate ligament reconstruction: A prospective, randomized clinical study with a minimum 10-year follow-up. *Am J Sports Med.* 2015;43(10): 2501-2509.
2. Issin A, Oner A, Sofu H, & Yurten H. Comparison of freeze-dried tibialis anterior allograft and four-strand hamstring autograft in anterior cruciate ligament reconstruction. *Acta Orthop Traumatol Turc.* 2018; <https://doi.org/10.1016/j.aott.2018.08.001>
3. Kaeding C, Aros B, Pedroza A, et al. Allograft versus autograft anterior cruciate ligament reconstruction: predictors of failure from a MOON prospective longitudinal cohort. *Sports Health.* 2011;3(1):73-81.
4. Lawhorn K, Howell S, Traina S, Gottlieb J, Meade T, & Freedberg H. The effect of graft tissue on anterior cruciate ligament outcomes: A multicenter, prospective, randomized controlled trial comparing autograft hamstrings with fresh-frozen anterior tibialis allograft. *Arthroscopy.* 2012;28(8):1079-1086.