GRAFT CHOICE FOR ADOLESCENT ATHLETES RETURNING TO HIGH-RISK SPORTS: A MATCHED COHORT ANALYSIS OF PATELLAR TENDON AND HAMSTRING AUTOGRRAFTS

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Background: Graft selection for skeletally mature adolescents undergoing anterior cruciate ligament (ACL) reconstruction is guided by surgeon and patient preference. In young patients returning to high-risk cutting and pivoting sports, graft rupture is the most feared complication of ACL reconstruction. Some studies have demonstrated slightly lower rates of graft failure and decreased laxity in the short term associated with patellar tendon (BTB) autografts as compared to hamstring (HS) autografts, but these studies are limited by their heterogeneity of ages and activity level\textsuperscript{1-3}. The purpose of this study is to compare the rates of graft failure between BTB and HS ACL reconstruction cohorts matched by age, sex, and sport.

Methods: A single-institution retrospective review was performed of consecutive patients less than 19 years of age treated with ACL reconstructions using either patellar tendon (BTB) or hamstring (HS) autograft performed by a single surgeon. Skeletally mature or nearly mature patients in “high-risk” ACL injury sports (basketball, football, soccer, lacrosse, and gymnastics) were initially treated with hamstring autografts but the graft preference transitioned to BTB autografts as the preferred graft choice during the study period. This transition in graft preference for adolescents participating in “high risk” sports allows for a comparison of outcomes based on graft types. Inclusion criteria were ages 13 – 18 years, participation in a “high risk” sport, and minimum 6-month follow-up. The two cohorts of patients were matched by age, gender, and sport. The primary outcome measure was graft rupture.

Results: One hundred fifty-two patients with an average age of 16 years (range 13 – 18 years) underwent ACL reconstruction during the study period. There were 71 BTB reconstructions and 81 HS reconstructions. There were 64 females and 88 males. There was no difference in age, sex, BMI, or laterality between groups. There were more patients who played soccer in the BTB cohort (44%) vs HS cohort (20%) and fewer who played basketball in the BTB cohort (24%) vs HS cohort (41%), p = 0.005. There were no differences between the BTB and HS cohorts in terms of meniscus tears (61% vs 72%, p = 0.15), meniscus repair (21% vs 32%, p = 0.13), or partial meniscectomy (32% vs 33%, p = 0.90).

Mean duration of follow-up was 28 months (range 7-57 months). There was no difference in follow-up between cohorts (BTB 28 months and HS 29 months, p = 0.19). There were a total of 16 graft ruptures (10.5%). There was no difference in the rate of graft rupture between cohorts (BTB 8.5% vs HS 12.3%, p = 0.60). Mean time to graft rupture was 21 months (range 8 – 35 months) and Kaplan-Meier survival curves demonstrated no difference between cohorts.

Conclusions: ACL reconstruction in adolescents returning to high-risk sports can be performed utilizing BTB or HS autografts with similar rates of graft rupture. There is a trend toward lower rates of graft rupture associated with BTB autografts, but additional patients will be necessary to determine if this trend will become a statistically significant difference.

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