Utility of a Physical Therapy Clearance Test in Pediatric ACL Reconstruction

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Figure 1: Study subject performing the T-shuffle

OBJECTIVES

Anterior Cruciate Ligament (ACL) reconstruction rates in pediatric and adolescent population have risen dramatically, and despite advances in technology and techniques, they continue to demonstrate higher failure rates when compared to adult cohorts in the first two years after surgery. When to release patients to full activity remains controversial, as do the indications for that release. We implemented a "Physical Therapy Clearance" test (PTC) at our institution as a means to help determine when a patient no longer required supervision by a physical therapist, signifying a potential readiness to initiate more athletic activity and then sought whether this intervention improved early graft failure rates or even prevented contralateral ACL injuries.

METHODS

All ACL reconstructions performed at our institution from 2012 to 2016 were retrospectively reviewed. Revision, multi-ligament, congenital absence, use of allograft, or any child lost to follow up before two years were excluded. Age, sex, laterality, graft choice, surgical technique and concomitant meniscal or chondral injury were documented. Two intervention cohorts (PTC completed and PTC not completed) were created along with a historical cohort of patients prior to PTC testing implementation. We compared the outcomes of all three cohorts, but did not include failures beyond 2 years as these are unlikely to change secondary to a PTC test given 6 months post-surgery. The duration of time from the reconstruction to PTC testing or release to athletic activity (if in the PTC not completed cohort) was assessed.

Figure 2: Study subject performing the crossover hop

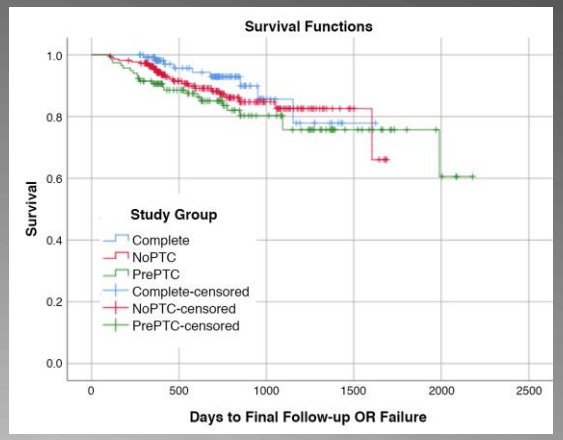
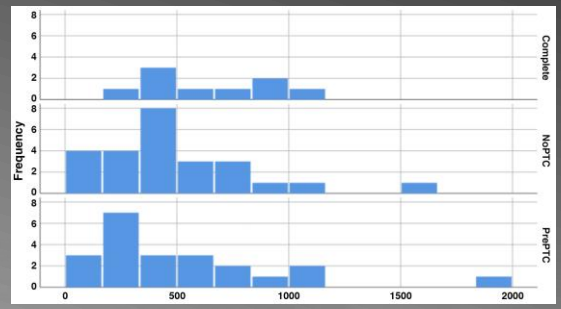


Figure 3: Survival analysis of the three cohorts with trending but non-significant differences (p=0.077)

RESULTS

Of 765 children identified there were 306 that met criteria for inclusion into the study. There were 16 early failures (17.4%) recognized in our historical control cohort as opposed to only 27 (12.6%) in the PTC cohort. We observed a graft failure rate of 6.8% in the cohort who completed PTC testing prior to release from physical therapy versus 14.5% of those who had not completed the PTC testing prior to release. There was no differences in subsequent contralateral ACL injuries between any of the 3 cohorts. Mean time to failure was shorter in the cohort not completing testing (392 days versus 491 days). Use of four-strand hamstring tendon (as compared to either Patella Bone-Tendon-Bone or Quadriceps tendon) was a confounding independent variable associated with higher failure rate.

Figure 4: The No PTC group had significantly longer days till activity (324) than the Complete PTC (275) and the Pre PTC(255).



CONCLUSIONS

Failure rates at our institution remain consistent with the existing literature and have generally improved over the past decade. While PTC test completion was associated with fewer graft failures in the short-term, it is unclear if this is due to passing the test itself or the delayed release to activity for those who took longer to achieve that milestone in recovery. This delay could allow for further graft incorporation time which is an understood benefit to delayed return to activity. Clear guidelines for completion of physical therapy is likely a single factor in what is an otherwise multifactorial process to the success of adolescent ACL surgery outcomes.

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