Functional Outcomes of Achilles Repair in the U.S. Military

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INTRODUCTION: Achilles tendon ruptures (ATR) are common injuries among adults and can cause significant pain and disability. To date, no studies have been performed to evaluate the functional outcomes of Achilles tendon repair (AR) using a standardized physical readiness test (PRT) in a military population. The intent of this study was to assess the outcomes of AR on physical readiness in U.S. Navy personnel.

METHODS:

This was a retrospective analysis of 2014-2020 data from the Military Health System Medical Data Repository (MDR) and Physical Readiness Information Management System. Achilles tendon rupture was identified using a procedure code from MDR (code 27650). The study cohort included military personnel who underwent only one Achilles tendon rupture procedure and who had cardiovascular Physical Readiness Test (PRT) assessments both before and after operative repair. The cardiovascular component was stratified into three subgroups: individuals who biked pre- and post-Achilles tendon rupture, those who ran, and those who ran pre-Achilles tendon rupture but transitioned to another cardiovascular test following operative repair. Specifically, participants who completed PRT cardiovascular assessments within 30 to 730 days pre-Achilles tendon rupture and 90 to 730 days post-Achilles tendon rupture were included in the analysis. Differences in pre- and post-Achilles tendon rupture PRT scores for the bike and run subgroups were compared using a paired t-test. Linear regression tested the differences in PRT scores between pre- and post-Achilles tendon rupture while adjusting for age, time since procedure, and sex. Changes in PRT categories pre- and post- Achilles tendon rupture were evaluated by converting the categories into discrete scores (i.e., Outstanding = 5, Excellent = 4, Good = 3, Satisfactory = 2, Probationary = 1, Failure = 0) and using a paired t-test for all cardiovascular subgroups. The proportions of individuals who improved, decreased, or maintained fitness categories were reported. The described analysis was repeated for a subgroup of individuals who completed two postoperative cardiovascular PRTs. The differences in the pre- and two post-scores for the running and biking subgroups were compared using paired t-tests.

RESULTS:

The composition of Navy personnel across the cardiovascular subgroup of the PRT ranged between 4% to 7% female and 93% to 96% male. Of the Navy personnel evaluated, 451 completed the cardiovascular section of the PRT pre- and post-Achilles tendon rupture as follows: 156 individuals biked, 127 ran, and 144 ran pre-Achilles tendon rupture but transitioned to another cardiovascular test following operative repair (run-to-another). On average, individuals performed worse on their PRTs post-Achilles tendon rupture compared with their pre-Achilles tendon rupture scores for the biking subgroup (+9.58 seconds, p=0.018) and the running subgroup (+40.79 seconds, p<0.001). When analyzing the changes in fitness category levels, there was no significant difference for the biking subgroup. On average, fitness category levels significantly declined for only the running subgroup (-0.252 categories, p<0.001) and run-to-another subgroup (-0.188 categories, p=0.011) between pre- and post-Achilles tendon rupture scores. Around 85% of individuals maintained or improved their PRT scores post-Achilles tendon rupture for the biking subgroup, in contrast to around 73% for the run-to-another subgroup and 69% for the running subgroup. There were between 0% and 1.5% new onset failures following Achilles tendon rupture. Lastly, when analyzing two postoperative PRT scores for the biking and running subgroup, participants significantly improved their running scores (-17.67 seconds, p=0.004), but not their biking scores.

DISCUSSION AND CONCLUSION: ATRs represent a significant musculoskeletal challenge impacting a substantial portion of individuals in the United States, including a notable prevalence among U.S. military personnel. Our findings reveal a notable decline in PRT scores following AR, which was particularly evident in running performance. However, most personnel returned to their pre-AR PRT score categories and there was a low failure rate, suggesting that AR may have a limited impact on military readiness.