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Frailty as a Predictor of Postoperative Complications in Patients Undergoing Esophagectomy

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Keywords

Frailty, esophagectomy, complications, esophageal cancer

Abstract

Background

Esophagectomy mortality rates can be decreased by selecting patients for whom benefits outweigh perceived risk. Frailty may correlate to fitness for surgical intervention. At our institution, we currently use preoperative stair climb ability to identify patients as "unfit" for intervention. This, however, has not yet been standardized or compared to other nationally available measures.

Methods

We preoperatively assessed stair climb time, pulse change, grip strength, and Edmonton Frail Scale (EFS) score. Postoperative complications in the first 30 days were classified using Clavien-Dindo, with Grade III or above defined as a major complication. Our primary analysis was a t-test comparing EFS score between patients with and without major complications with secondary analyses of t-tests comparing stair climb time, grip strength, and pulse change to complication status. We also measured correlations among the different frailty measures.

Results

For subjects undergoing esophagectomy (n=34; mean age 64, SD 11; 79.4% male), prospective EFS score, grip strength, and stair climb time were statistically significantly correlated. Mean EFS score was significantly associated with complication status (p=0.04), where mean EFS for no major complications was 3.0 points and mean EFS for major complications was 4.7 (difference of 1.7 points, 95% CI: 0.09-3.2). Stair climb time (difference of 11.0s, 95% CI: -0.38-22.4) and grip strength (difference of 7.7kg, 95% CI: -0.94-16.3) trended toward but did not demonstrate statistically significant differences. Pulse change was clinically insignificant.

Discussion

Prospective EFS score is significantly higher for patients with major postoperative complications. This confirms this survey's validity in measuring baseline preoperative frailty. Patients with scores of 5 or higher should be cautioned on increased surgical risks. This finding is important as stair climb ability was not demonstrated to be the most effective measure. We have demonstrated that there is a simpler, stronger measure to predict frailty in this patient population.