

In patients aged ≥ 85 years, muscle quality but not quantity is linked to baseline pain-related disability after lumbar spine surgery

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Introduction

Rapid population aging has led to an increase in lumbar spine surgery among super-elderly patients. In very old adults, sarcopenia is common and linked to postoperative complications and mortality; however, associations with patient-reported outcomes are inconsistent, and data in patients aged ≥ 85 years are scarce. Because muscle status includes both quantity and quality, their relative importance for PROMs in this population remains unclear. We therefore examined whether preoperative paraspinal muscle quantity or quality is more closely associated with PROMs at baseline, at 1 year, and with changes from baseline.

Materials and Methods

This retrospective observational study included 43 patients aged ≥ 85 years who underwent surgery for degenerative lumbar disorders. Preoperative L3 muscle quantity (paraspinal muscle index [PMI]) and quality (CT attenuation [Hounsfield units, HU]; MRI-based Goutallier grading) were assessed. Patient-reported outcome measures (PROMs) were collected preoperatively and at 1 year. Associations at baseline, at 1 year, and change from baseline (Δ) were examined using Spearman correlations; analyses of Δ used partial Spearman correlations adjusting for baseline scores. An exploratory receiver operating characteristic (ROC) analysis evaluated the ability of HU to identify low preoperative Japanese Orthopaedic Association Back Pain Evaluation Questionnaire (JOABPEQ) low back pain scores (≤ 29).

Results

PMI was not significantly associated with any PROM. HU correlated positively with preoperative JOABPEQ low back pain ($p = 0.379$, $P = 0.016$), whereas Goutallier grade correlated inversely with the same PROM ($p = -0.374$, $P = 0.018$) and with preoperative SF-8 PCS ($p = -0.307$, $P = 0.048$). Unadjusted correlations between muscle quality and Δ JOABPEQ low back pain were attenuated after baseline adjustment (HU partial $p = -0.236$, $P = 0.155$; Goutallier partial $p = 0.191$, $P = 0.251$); the baseline-adjusted association between Goutallier grade and Δ SF-8 PCS was not statistically significant (partial $p = 0.305$, $P = 0.059$). In exploratory ROC analysis, HU demonstrated fair discrimination for low JOABPEQ low back pain scores (AUC = 0.740, 95% CI 0.586–0.893), and the Youden index suggested a cutoff value of 33.7 HU.

Conclusion

In super-elderly patients undergoing lumbar spine surgery, paraspinal muscle quantity (PMI) was not associated with PROMs, whereas muscle quality measures (HU and Goutallier grade) were associated with preoperative pain-related disability. Associations with postoperative change were largely explained by baseline status. These findings underscore the clinical relevance of assessing muscle quality during preoperative counseling while reinforcing that poor muscle status alone should not be interpreted as a contraindication to surgery in this super-elderly population.