SARCOPENIA AS A MAJOR PREDICTOR OF UNFAVORABLE REHABILITATION OUTCOMES FOLLOWING SURGICAL TREATMENT OF GASTRIC CANCER

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Background. Gastric cancer surgery frequently results in reduced oral intake, gastrointestinal symptoms, weight loss and prolonged functional impairment. Sarcopenia, defined by impaired muscle strength and low muscle quantity or quality, may be present before surgery and may worsen during the perioperative period. Low muscle mass alone on computed tomography should not automatically be equated with confirmed sarcopenia; muscle strength and relevant diagnostic criteria should also be considered. Because body mass index may conceal skeletal muscle depletion, structured preoperative assessment could improve rehabilitation planning.

Objective. To determine the association of preoperative sarcopenia with adverse postoperative rehabilitation outcomes and to evaluate its incremental predictive value beyond established clinical and surgical factors.

Materials and Methods. A prospective observational cohort of adults with histologically confirmed gastric adenocarcinoma undergoing curative-intent subtotal or total gastrectomy is proposed. Baseline variables will include age, sex, tumor stage, performance status, comorbidity burden, neoadjuvant treatment, body mass index, weight loss and nutritional risk. Skeletal muscle area will be measured on routinely acquired preoperative CT images at the third lumbar vertebral level and normalized for height to derive skeletal muscle index (SMI). Handgrip strength, chair-stand performance and gait speed will be recorded where feasible. Sarcopenia will be classified according to a prespecified consensus definition and sex-specific thresholds appropriate to the population. CT measurements will be performed by trained readers blinded to clinical outcomes, with interobserver agreement assessed in a subset.

Outcome Measures. The primary endpoint will be unfavorable functional recovery at 90 days, defined prospectively using a validated physical function scale or clinically meaningful deterioration from baseline. Secondary endpoints will include Clavien–Dindo grade III or higher complications within 30 days, length of stay, readmissions, postoperative nutritional status, return to independent activities and quality of life measured using EORTC QLQ-C30 and gastric cancer-specific QLQ-STO22 instruments. Assessments are planned preoperatively, at discharge, and at 30 and 90 days; a six-month assessment may be added.

Statistical Analysis. Descriptive statistics will characterize sarcopenic and nonsarcopenic groups. Between-group comparisons will use appropriate parametric or nonparametric methods. Multivariable logistic regression will estimate adjusted associations with the primary endpoint, accounting for age, stage, comorbidities, neoadjuvant therapy, surgical extent and baseline functional status. Continuous predictors will be retained where possible rather than arbitrarily dichotomized. Discrimination will be examined using ROC AUC, calibration plots and bootstrap internal validation. Missing data will be described and, when appropriate, handled through multiple imputation.

Expected Results and Scientific Significance. Patients with confirmed sarcopenia are hypothesized to experience poorer functional recovery and greater postoperative rehabilitation needs. The study will establish whether muscle assessment provides clinically meaningful prognostic

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information after adjustment for nutritional and operative risk. No effect sizes, p-values or observed differences are asserted before data analysis.

Conclusion. A standardized assessment of skeletal muscle strength and quantity may support preoperative identification of gastric cancer patients requiring intensified nutritional and physical rehabilitation. Prospective analysis is needed to establish independent prognostic utility and actionable risk thresholds.

Keywords. gastric cancer; sarcopenia; skeletal muscle index; gastrectomy; functional recovery; rehabilitation; risk prediction.

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