

## Abstract

**Background:** This study aims to compare demographic, risk and complication profiles of pediatric and adult patients who underwent supercharged pedicled jejunal interposition for esophageal reconstruction.

**Methods:** A systematic review and meta-analysis were performed, which included patients who underwent esophageal reconstruction with supercharged jejunum from 23 published studies. Patients were divided into two groups: pediatric/young adults ( $\leq 18$  years), and adults ( $> 18$  years). The primary outcome was postoperative complications. Python 3.11 with pandas was used for data management, scikit-learn for Ridge regression and imputation of missing values, and SciPy for statistical analysis. Ridge regression analysis was utilized with regularization ( $\alpha=0.1$ ), while examining the relationship between demographic factors and overall complication rates in adult patients to account for limited sample sizes.

**Results:** A total of 254 manuscripts were reviewed, and 23 studies met inclusion criteria. Of 477 included patients, 415 were adults (87%) and 62 were pediatric patients (13%). Adult patients had significantly higher odds of developing an anastomotic leak (OR 8.63,  $p < 0.01$ ), and dysphagia (5.99,  $p < 0.02$ ) following surgery. Preoperative radiation was positively associated with postoperative dumping symptoms ( $\beta = .56$ ), stricture formation ( $\beta = .27$ ), poor wound healing ( $\beta = .27$ ), and need for reoperation ( $\beta = .27$ ). A history of cancer was most positively associated with anastomotic leak ( $\beta = .22$ ) following surgery. Preoperative radiation was positively association with anastomotic leak ( $\beta = .12$ ). Smoking demonstrated a strong inverse association with the need for reoperation ( $\beta = -0.66$ ), and a weaker inverse association with leakage ( $\beta = -.25$ ).

**Conclusions:** Adult patients have a significantly greater likelihood of experiencing postoperative anastomotic leakage and dysphagia compared to pediatric patients. Preoperative radiation was associated with dumping symptoms, stricture, need for reoperation, poor wound healing, and pulmonary complications. Smoking was associated with decreased need for reoperation and anastomotic leakage.