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RELATIONSHIP BETWEEN RESECTION EXTENT AND RESPIRATORY FUNCTION CHANGES IN LUNG SEGMENTECTOMY

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Objectives

This study aimed to elucidate the effects of planned resection volume on postoperative pulmonary function and changes in residual lung volume during segmentectomy.

Methods

We included patients who underwent thoracoscopic segmentectomy between January 2017 and December 2022 and met the eligibility criteria. Pre- and post-resection spirometry and computed tomography (CT) were performed. Volumes of the resected, remaining, and nonoperative lung regions were calculated using three-dimensional CT reconstructions. Patients were categorized into higher and lower volume segmentectomy groups based on resected region volume. Comparative analysis of changes in lung volume and pulmonary function before and after surgery was conducted.

Results

The median percentage of resected lung volume was 10.9%. Postoperative forced expiratory volume in 1 s (FEV1) and forced vital capacity (FVC) ratios to preoperative measurements did not differ significantly between the groups (FEV1, $p=0.254$; FVC, $p=0.777$). However, postoperative FEV1 and FVC ratios to their predicted postoperative values were significantly higher in the higher volume segmentectomy group (FEV1, $p=0.003$; FVC, $p<0.001$). Additionally, the higher volume segmentectomy group showed significantly greater post-to-preoperative lung volume ratio in overall, contralateral, ipsilateral, residual lobe, and residual segment than the lower volume segmentectomy group.

Conclusions

Postoperative respiratory function did not differ significantly between higher- and lower volume segmentectomy groups, suggesting improved respiratory function due to substantial postoperative residual lung expansion. Key findings were consistent across upper and lower lobe, and smoker and never-smoker subgroups, though reduced sample size in subgroups led to some attenuation of statistical significance.