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Postoperative drainage time for air leaks after lung resection for non-small cell lung cancer (NSCLC): a retrospective cohort analysis

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Introduction: With the advance of minimally invasive thoracic surgical techniques, postoperative hospitalization is shorter, and recovery is faster. However, chest drainage may be a limiting factor for hospital discharge, extending the hospital stay. Therefore, it is vital to understand the elements that could affect it so we can develop ways to prevent it. **Objective:** This study aims to assess the parameters that influence chest drainage for air leaks following anatomical lung resection for lung cancer.

Methods: We queried our institutional database of lung cancer resection for all patients between June 2009 to December 2022 who underwent lobectomy or anatomical segmentectomy. The primary outcome was chest tube drainage time due to an air leak. We excluded patients who underwent wedge resection and pneumonectomy and those who developed chylothorax or postoperative bleeding. Univariable comparisons were performed with χ^2 , Mann-Whitney, and Kruskal-Wallis tests, and multivariable with logistic regression modeling.

Results: We analyzed 743 patients, 56.5% women, with a median age of 66.2 years. Most patients (83.7%) had the treatment in the public healthcare system. 72.8% had a positive smoking history. The median overall chest drainage time was 3 days (interquartile range IQR 2-4). Baseline characteristics associated with lower chest drainage time were female and younger patients, private healthcare, negative smoking history, absence of emphysema, and lower body mass index.

Open surgery had a higher median drainage time vs. video-assisted thoracic surgery (VATS) and robotic-assisted thoracic surgery (RATS) ($p < 0.001$). VATS and RATS had the same median time, but the robotic approach had a smaller IQR (Figure 1). Lobectomy had a median drainage time of 3 days (IQR 2-5) *versus* segmentectomy 2 days (IQR 1-3) ($p < 0.001$). The right upper lobectomy had a higher drainage time than every other lobectomy ($p < 0.001$). On multivariable analysis, the following features were statistically significant for lower drainage time: emphysema, lobectomy, surgical approach, and postoperative in the intensive care unit.

Conclusion: The chest drainage time after anatomical resection was longer in patients with pulmonary emphysema, lobectomy, open approach, and postoperative admission in the intensive care unit. Although VATS and RATS had the same median

drainage time, in general the robotic approach had the tendency for a shorter period of chest drainage.

Keywords: Lung lobectomy; Ais leaks; Postoperative complication

RECOMMENDED BIBLIOGRAPHY

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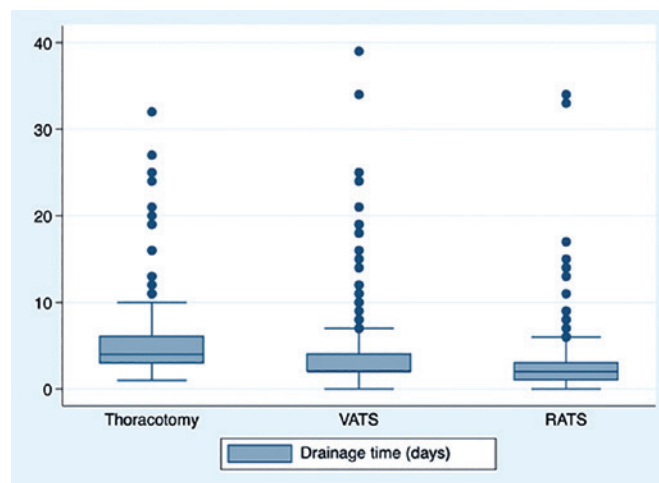


Figure 1. Box plot graph comparing the drainage time on open surgery, VATS, and RATS