

Pigtail and Chest Tube (PACT) Study for Post-Operative Robotic Lobectomies: A Propensity Score Matched Analysis

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Introduction

Historically, pulmonary resection has necessitated the use of two chest tubes to control re-expansion by mitigating air leak and fluid accumulation. Some centers, however, have transitioned to single chest tube drainage with success^{1,2}. However, we postulate that this may increase length of stay, has higher rates of readmission, and chest tube reinsertion. The aim of our study is to investigate whether a pigtail catheter and conventional chest tube is adequate for management of robotic lobectomies compared to a single chest tube.

Methods

A retrospective analysis was performed using data collected from 500 lobectomies performed at our institution from 2010 to 2018 after IRB approval. Inclusion criteria included adults who underwent robotic lobectomies between 2010 and 2018 for non-small cell lung cancer. Lobectomies performed for other disease processes, segmentectomies, and non-anatomic resections were excluded. Additionally, open and/or thorascopic resections were also excluded. Variables included patient demographics, readmission rates, length of stay, and chest tube complications. Subjects were categorized into a single 24-French chest tube or one 24-French chest tube and one 14-French pigtail catheter. Propensity score matching was utilizing for matching. Statistical analysis was performed using Mann-Whitney U and chi squared tests with significance determined by a p-value of <0.05.

Sex

- 173 M
- 227 F

FEV 1 DLCO

- FEV1 84%
- DLCO 77%

Smoker

- Current-69
- Former-267
- Never-64

Results

<i>Unadjusted Variables</i>	<i>24 Fr</i> n=96 (st.dev.) [%]	<i>24/14 Fr</i> n=333 (st.dev.) [%]	<i>p-value</i>
Air Leak > 5 days	7 [7%]	22 [7%]	p = 0.814
Post-Op LOS days	4.16 (2.2)	3.2 (1.8)	p < 0.0001
Discharge with CT	5 [5%]	36 [11%]	p = 0.100
30 Day Readmit	11 [11%]	20 [6%]	p = 0.069
Pigtail Rescue	6 [6%]	50 [15%]	p = 0.025

Table 2. Table of unadjusted variables demonstrating number of patients with air leaks after 5 days, average post-operative length of stay, number of patients discharged with chest tubes, number of patients readmitted after 30 days, and number of patients requiring pigtail catheter for rescue after removal of large bore chest tube. **Of those, only post-operative length of stay (LOS) and pigtail rescue were statistically significant.**

<i>Adjusted Variables</i>	<i>24 Fr</i> n=81 (st.dev.) [%]	<i>24/14 Fr</i> n=81 (st.dev.) [%]	<i>p-value</i>
Air Leak > 5 days	5 [6%]	6 [7%]	p = 0.76
Post-Op LOS	4.14 (2.0)	3.42 (2.1)	p = 0.001
Discharge with CT	3 [4%]	8 [10%]	p = 0.12
30 Day Readmit	10 [12%]	5 [6%]	p = 0.18
Pigtail Rescue	5 [6%]	13 [16%]	p = 0.046

Table 3. Table of adjusted variables with similar variables as noted in Table 2. **Of those, only post-operative length of stay (LOS) and pigtail rescue were statistically significant.**

Management Algorithm

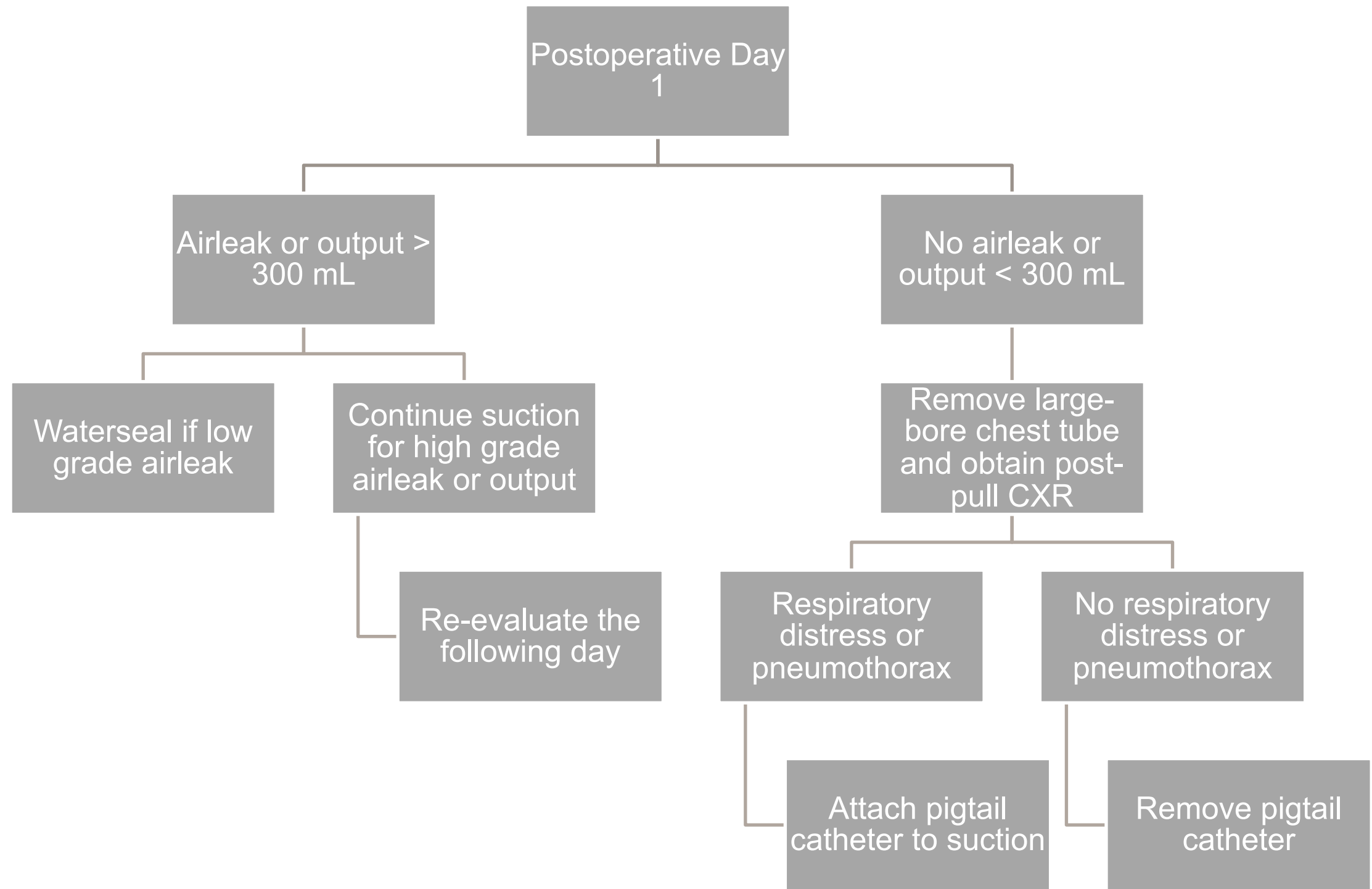


Figure 1. Proposed algorithm for post-operative management of pigtail and chest tube (PACT)

Conclusion

Post-operative pigtail catheter and chest tube placement is a viable alternative to single post-operative chest tube for pleural management after lobectomy. Patients experienced a statistically significant shorter length of stay on average with both a pigtail and conventional chest tube compared to a single chest tube. We attribute the significant difference noted in pigtail rescue to the availability of an existing small-bore tube for pleural rescue after removal of large bore chest tube. The addition of a pigtail catheter also does not increase the likelihood of being discharged with a chest tube. Our study demonstrates that the addition of a pigtail catheter to a large bore chest tube]can accelerate the post-operative recovery period and serves as a backup for management of post-pull pleural pathology in robotic lobectomies.

References

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