

Title: Twice as Nice or Double the Trouble: A Single Institution Experience with Sequential Chest Tubes for Persistent Pneumothorax

Authors: tefan Brancel, Claire Sorek, Ivan Rakic, Nick Reeser, P. Joe Massa

Henry Ford Hospital

Purpose:

Chest tube placement is a relatively common procedure and remains standard of care for pneumothorax treatment. Normally a single chest tube is placed which successfully treats the pneumothorax. However, persistent pneumothorax can occur after chest tube placement due to persistent air leak or trapped lung. Current literature suggests surgical or endobronchial interventions for these cases {1}. There is a paucity of literature surrounding the effectiveness of multiple chest tubes for pneumothorax. This study aims to evaluate the safety and efficacy of placing an additional chest tube in the setting of a persistent pneumothorax when one or more chest tubes is already in place.

Materials and methods:

All image guided chest tubes placed for pneumothorax at a quaternary urban hospital in the last 5 years were retrospectively reviewed. Cases were included if there was an existing chest tube prior to additional image-guided chest tube placement and if both tubes remained in place at a 12-48 hour follow-up chest radiograph. Measurement of pneumothorax on pre-procedural imaging and at 12-48 hour follow-up imaging was compared. Respiratory support with supplemental oxygen or intubation was recorded before and 24 hours after the procedure. The study group was 67 % (n=12) male with an age range of 30 – 80 years.

Results:

17 of 131 image guided chest tubes for pneumothorax met criteria for review. Etiologies include post-surgical (12), secondary spontaneous (2), and post-traumatic (3). Pneumothorax size decreased significantly on post-procedural imaging ($P < 0.01$) after sequential chest tube placement. There was a trend towards decreased supplemental oxygen ($p=0.17$). No complications of additional image guided chest tubes were reported.

Conclusion:

Additional image-guided chest tubes for pneumothorax are a safe procedure with no complications being reported in this small study. In patients with diverse etiologies of pneumothorax, imaging findings can be improved with placement of additional chest tubes, but supplemental oxygen requirements did not significantly change.

References:

1. Sakata KK, Reisenauer JS, Kern RM, Mullon JJ. Persistent air leak - review. *Respir Med.* 2018;137:213-218. doi:10.1016/j.rmed.2018.03.017