

Lung Plug for Prevention of Pneumothorax After Biopsy

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Authors:

F. Hao¹, J. Moseley², J. Weintraub³, D. Mobley⁴

Institutions:

¹Columbia University Medical Center, New York, NY, ²Maimonides Medical Center, Brooklyn, NY, ³N/A, Scarsdale, NY, ⁴N/A, Brooklyn, NY

Abstract Presenter:

Frank Hao, MD

Columbia University Medical Center
New York, NY

Co-Author(s):

Jessica Moseley, M.D.

Maimonides Medical Center
Brooklyn, NY

Joshua Lorin Weintraub, MD, FSIR

N/A

Scarsdale, NY

David Mobley, MD

N/A

Brooklyn, NY

Purpose:

Computed tomography (CT)-guided percutaneous core biopsy of intrathoracic lesions is a well-established, minimally invasive procedure. However, clinically significant resultant pneumothoraces do occur. We investigated whether the use of a desiccated polyethylene

glycol hydrogel lung plug prevents clinically significant pneumothoraces requiring chest tube placement and admission.

Materials:

A HIPPA compliant IRB approved retrospective study was performed. From 6/2013 to 5/2014, 168 consecutive patients were identified to have undergone CT-guided percutaneous core lung biopsy. 82 patients were treated with the plug device after biopsy, and the other 85 patients received standard post lung biopsy care. Chi square statistical analysis was performed. Additional stratification was evaluated, including lesion size, pleural to lesion distance, skin to lesion distance, presence of emphysema, and number of needle passes utilizing two-tailed t-test statistical analysis.

Results:

The pneumothorax rate for the standard post lung biopsy care was 39/85 (45.9%), compared to 30/82 (36.6%) for the sealant group, $p=0.091$. 19/85 (22.4%) patients had clinically significant pneumothoraces with standard post biopsy care requiring chest tube placement and subsequent admission, and 9/82 (11%) patients developed clinically significant pneumothoraces with the plug device, $p=0.01$. No significant differences were found in the rate of pneumothorax between the two groups isolating for lesion size ($p=0.14$), pleura to lesion distance ($p=0.024$), skin to lesion distance ($p=0.64$), and number of needle passes ($p=0.08$).

14/30 (47%) patients with emphysema developed pneumothorax after biopsy with the device compared to 13/23 (56.5%) without it, $p=0.05$. 7/30 (23%) patients with emphysema who received the plug device after lung biopsy required chest tube placement and admission, compared to 11/23 (47.8%) without it, $p=0.0006$.

Conclusions:

Patients who received the plug after CT-guided lung biopsy developed less clinically significant pneumothoraces requiring chest tube placement and admission accounting for lesion size, position, and emphysema, resulting in significant cost savings.

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