

## Clinical outcomes of pneumothorax ex vacuo following catheter drainage of malignant pleural effusion

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**Background:** Pneumothorax ex vacuo occurs due to the failure of normal lung expansion and strongly negative pleural pressure created during pleural fluid drainage in patients with pleural effusions. However, data regarding the prognostic impact of pneumothorax ex vacuo on patients with malignant pleural effusion (MPE) are limited. Thus, this study aimed to investigate the clinical course and outcomes of the development of pneumothorax ex vacuo following image-guided percutaneous catheter drainage (PCD) in patients with MPE.

**Methods:** We retrospectively reviewed consecutive patients who were diagnosed with MPE and underwent ultrasonography-guided PCD from January 2011 to November 2020. Clinical, pleural fluid, and radiologic data and survival outcomes of MPE patients were analyzed and compared between those with and without pneumothorax ex vacuo following PCD.

**Results:** Among 167 MPE patients undergoing PCD, pneumothorax ex vacuo occurred in 31 (19%). Patients with pneumothorax ex vacuo had higher pleural fluid lactate dehydrogenase levels and frequency of endobronchial lesions compared to those without. Secondary pleural infection rates were comparable between the two groups (3%), but the median time to catheter removal was significantly extended in those with pneumothorax ex vacuo compared to those without (17 days vs. 8 days,  $P < 0.001$ ). The development of pneumothorax ex vacuo did not affect the survival outcomes of patients with MPE, regardless of chemotherapy (Figure 1).

**Conclusions:** Pneumothorax ex vacuo developed in one-fifth of MPE patients undergoing image-guided PCD. The poor survival outcome of patients with MPE was not further affected by the development of pneumothorax ex vacuo.

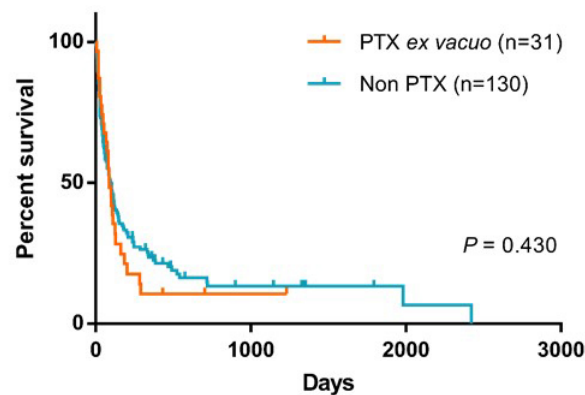


Figure 1. Kaplan–Meier survival analysis by pneumothorax *ex vacuo* in patients with malignant pleural effusion

PTX = pneumothorax.