

# Multidisciplinary team approach for complicated pneumothorax

Atsushi Sano

Department of Thoracic Surgery, Chigasaki Municipal Hospital, Chigasaki, Japan

Correspondence to: Atsushi Sano, MD, PhD. Department of Thoracic Surgery, Chigasaki Municipal Hospital, Honson 5-15-1, Chigasaki, Kanagawa 253-0042, Japan. Email: sanoa-tky@umin.ac.jp.

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For healthy patients, the treatment strategy for primary spontaneous pneumothorax is easy to determine (1). First, either aspiration, chest drainage, or observation is chosen based on severity. In some institutions, outpatient drainage therapy is another option (2,3). Next, surgery is performed for patients with prolonged air leakage or to prevent relapse.

On the other hand, secondary spontaneous pneumothorax is sometimes difficult to treat. Secondary spontaneous pneumothorax is associated with underlying lung diseases such as chronic obstructive pulmonary disease and interstitial pneumonia, which sometimes cause respiratory failure via pneumothorax. Due to the underlying lung disease, treatment failure and in-hospital mortality occur more frequently in patients with secondary versus primary spontaneous pneumothorax (4). Similarly, primary spontaneous pneumothorax in patients with underlying diseases or conditions, such as pregnancy, is also sometimes difficult to treat (5). For such patients, a multidisciplinary team approach is essential (6).

## Decision to perform surgery

In patients with secondary pneumothorax, surgery is mainly performed due to prolonged air leakage. Prolonged air leakage occurs more frequently in patients with secondary spontaneous pneumothorax than in patients with primary spontaneous pneumothorax (7,8). The healing rate is low after 48 hours. Therefore, invasive interventions such as surgery should be considered for patients with secondary pneumothorax who have air leakage for 48 hours or more. If air leakage persists for more than 2 days, we should start to check whether the patient can tolerate an operation under general anesthesia and consult with the thoracic surgeon

and anesthesiologist. When the patient cannot endure an operation, other treatments such as pleurodesis, endoscopic bronchial occlusion, and intravenous coagulation factor XIII concentrate therapy should be considered (9,10).

## Nutrition

Malnutrition can complicate the treatment of pneumothorax. It has been reported that air leakage persists despite standard therapy and re-expansion pulmonary edema occurs due to malnutrition in patients with pneumothorax and anorexia nervosa (11,12). Malnutrition causes delayed wound healing, which means prolonged air leakage in patients with pneumothorax. Malnutrition also causes re-expansion pulmonary edema after drainage due to mechanical and functional changes in the lung (12). Therefore, it is important to improve nutritional status during therapy for pneumothorax. Consultation with a nutritional support team should be considered in the course of therapy for pneumothorax in malnourished patients.

## Single-stage bilateral lung resection

Simultaneous bilateral spontaneous pneumothorax is a rare condition that is sometimes difficult to treat. While simultaneous thoracoscopic surgery is usually performed for simultaneous bilateral primary spontaneous pneumothorax, simultaneous bilateral secondary pneumothorax is difficult to treat. It is an indicator of advanced lung pathology with a poor prognosis (13).

Recently, single-stage thoracoscopic bilateral lung resection for lung cancer has been reported (14,15). Although many patients who undergo single-stage thoracoscopic

bilateral lung resection have been discharged without complications, postoperative complications such as pneumonia, acute exacerbation of interstitial pneumonia, and death have been reported (14). Due to the prolonged duration of surgery and one-lung ventilation for both lungs during surgery, more complications might occur in single-stage bilateral lung resection than in unilateral lung resection.

Unilateral pneumothorax surgery is not considered a major invasive procedure. However, single-stage bilateral lung surgery is more invasive and more complications might occur. Patients with simultaneous bilateral secondary spontaneous pneumothorax often have poor clinical status. When we plan bilateral surgery for bilateral secondary spontaneous pneumothorax, we should carefully select either one-stage or two-stage surgery based on the patient's status. During the decision-making process, consultation with a pulmonologist, intensivist, or anesthesiologist is useful.

### Conclusions

Unlike primary spontaneous pneumothorax, secondary spontaneous pneumothorax is sometimes difficult to treat due to underlying disease. In complicated cases, a multidisciplinary team approach should be considered early in the course of treatment.

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### Footnote

*Conflicts of Interest:* The author has no conflicts of interest to declare.

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