

Bronchopleural Fistula

James Liang, DO*
Adam Field, MD*
Kimberly Liang, PharmD†

* Naval Medical Center San Diego, Department of Emergency Medicine, San Diego, California

† Naval Medical Center San Diego, Department of Pharmacy, San Diego, California

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A 58-year-old man presented to the emergency department with diffuse swelling and crepitus of his face, chest, and extremities due to subcutaneous air (Figure). The patient had a history of lung cancer and had undergone a video-assisted transthoracic surgery (VATS) with decortications. His airway was maintained, and the patient reported only minimal shortness of breath with change in his phonation. Computed tomography of the chest showed a tumor at the left lung and an associated pneumothorax, along with extensive subcutaneous emphysema and pneumomediastinum throughout the thorax. An air source was found from the left chest due to a bronchopleural fistula (BPF).

A BPF is often a fatal complication of lung surgery postoperatively. It is defined as an abnormal communication between the bronchial tree and the pleural space.¹⁻² Air dissects along the bronchi and pulmonary vessels into the mediastinum, and may move into the subcutaneous space of the face and neck.³ The fistula is usually very small (about the size of a pinhole). The incidence is around 1-4% in patients undergoing lung surgery. The mortality rate ranges from 16-72%.⁴⁻⁶ Risk factors associated with the development of a BPF include diabetes, malignancy, and immunosuppressive therapy.⁷ A BPF that occurs in the early postoperative period is thought to be due to incomplete stapling or suturing of the bronchial stump. A BPF that occurs after 7 days postoperatively is usually secondary to ischemia or necrosis due to a tumor or extension of an empyema.² Treatment includes suturing, omentopexy, and muscle plumbage. For small BPFs, minimally invasive techniques have also been used, such as a stent insertion, fibrin sealants, and one-way valve insertion.¹

Subcutaneous emphysema usually resolves spontaneously, with minimal intervention. There are case reports of severe airway obstruction. If stridor develops, then upper airway obstruction is a possibility and endotracheal intubation should be done without delay.⁸ In a patient requiring intubation, consideration should be given to placement of a prophylactic chest tube, as the positive intrathoracic pressure can worsen the subcutaneous emphysema.⁹



Figure. Soft tissue swelling due to subcutaneous air.

Address for Correspondence: James Liang, DO. Department of Emergency Medicine, Naval Medical Center San Diego, 34800 Bob Wilson Drive, San Diego, CA 92134. Email: jmcl73@yahoo.com.

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