Management of Extensive Subcutaneous Emphysema with Vacuum Drainage, without Closed Thoracostomy

Seok Joo, Yang Bin Jeon
Department of Trauma Surgery, Gachon University Gil Medical Center, Incheon, Korea

A 77-year-old man presented with extensive subcutaneous emphysema and severe dyspnea. We were not able to perform closed thoracostomy because of severe pleural adhesions. Therefore, we treated the subcutaneous emphysema successfully with closed vacuum drainage.

Key Words: Subcutaneous Emphysema; Tissue Adhesions; Pleura

CASE

A 77-year-old man presented with extensive subcutaneous emphysema and severe dyspnea. He had multiple traumatic rib fractures, extensive subcutaneous emphysema, pneumomediastinum, and pneumothorax in the left hemithorax (Fig. 1). He had a past medical history of coronary artery bypass, chemotherapy for lung cancer, stent insertion for thoracoabdominal aortic aneurysm, balloon dilatation for peripheral vascular disease, heart failure, and diabetic nephropathy. We were not able to perform closed thoracostomy because of severe pleural adhesions (Fig. 1). However, we had to remove the subcutaneous emphysema because of the patient’s severe dyspnea and poor general condition. Therefore, we choose closed vacuum drainage. The upper part of the previous sternotomy wound was incised and vacuum drainage was applied (Fig. 2). The vacuum drainage system was removed from the patient because the subcutaneous emphysema had almost resolved (Fig. 3). There was no recurrence of the subcutaneous emphysema and pneumothorax 1 day later.

DISCUSSION

Though self-limiting, subcutaneous emphysema should be treated when it causes palpebral closure, dyspnea, dysphagia, or undue disfigurement (1). Massive accumulated air can compress the trachea and great vessels, which can severely compromise the airway, venous return, and blood flow to the head and neck (2). After alveolar rupture, air preferentially moves from the pulmonary interstitium along the bronchovascular sheaths to the lung hilum from where it can pass superficial to the endobronchial fascia towards the thoracic inlet. Therefore, the best site for decompressing subcutaneous emphysema is at the level of the thoracic inlet (1). The key to successful vacuum therapy is sufficient dissection.
Fig. 1. Axial view of a CT scan of the chest shows multiple rib fractures, extensive subcutaneous emphysema, pneumomediastinum, and pneumothorax in the left hemithorax.

Fig. 2. (A) Applied vacuum drainage. (B) Sterile polyurethane foam and adhesive drape. (C) Electronic vacuum pump.

Fig. 3. (A) Chest anteroposterior view radiograph shows extensive subcutaneous emphysema. (B) After 2 days, chest anteroposterior view radiograph shows decreased subcutaneous emphysema.
of the prepectoral fascial plane for aspiration of trapped subcutaneous air (2). The initial treatment for extensive subcutaneous emphysema is closed thoracostomy (1,2). However, in our case, we could not perform closed thoracostomy, so we applied vacuum drainage to successfully manage the subcutaneous emphysema.

Conflict of Interest Statement
No potential conflict of interest relevant to this article was reported.

REFERENCES