


Re-expansion pulmonary edema after thoracentesis for iatrogenic pneumothorax and severe subcutaneous emphysema

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Abstract

Subclavian central venous catheterization can cause severe complications, including tension pneumothorax, subcutaneous emphysema, and pneumomediastinum. Re-expansion pulmonary edema after thoracentesis is a life-threatening complication.

KEYWORDS

central venous catheter, pneumothorax, re-expansion pulmonary edema, subclavian vein, subcutaneous emphysema

Subclavian central venous catheter replacement caused iatrogenic pneumothorax, extensive subcutaneous emphysema, and pneumomediastinum; and thoracic drainage to relieve the pneumothorax was complicated by subsequent re-expansion pulmonary edema.

A 67-year-old Japanese woman with a history of schizophrenia underwent central venous catheter (CVC) replacement *via* the right subclavian vein for parenteral nutrition due to low body mass index (14.2 kg/m²) at another hospital. Eight days later, she was transferred to our hospital with progressive chest pain and shortness of breath. Subcutaneous emphysema was detected upon palpation of her neck and the right precordial area. Chest X-ray and computed tomography showed a severe right-sided pneumothorax, a large subcutaneous emphysema, and a pneumomediastinum (Figures 1,2). A temporary chest tube was inserted to relieve the pneumothorax, and improvement was seen within 1 hour (Figure 3A).

About 6 hours later and despite oxygen administration at 10 L/min using a reservoir mask, her percutaneous oxygen saturation dropped. Chest X-ray revealed re-expansion pulmonary edema with patchy diffuse consolidation on the right side (Figure 3B). Non-invasive ventilation at 10 cm H₂O-positive end-expiratory pressure was initiated to manage respiration and was followed by nasal high-flow therapy at the rate of 40-60 L/min.

Re-expansion pulmonary edema is a rare complication of thoracic drainage that occurs in 1%-30% of patients undergoing the procedure,^{1,2} and its causes include lung collapse for an extended duration and rapid re-expansion. Risk factors that increase the incidence of complications after subclavian CVC placement include marked malnutrition, mental disorders, and prior central venous access,¹ and our patient displayed most of these factors. Thus, careful observation after subclavian CVC insertion is essential to prevent these life-threatening complications.

FIGURE 1 Chest X-ray before subclavian catheter replacement (A) and right-sided pneumothorax (B) after removal

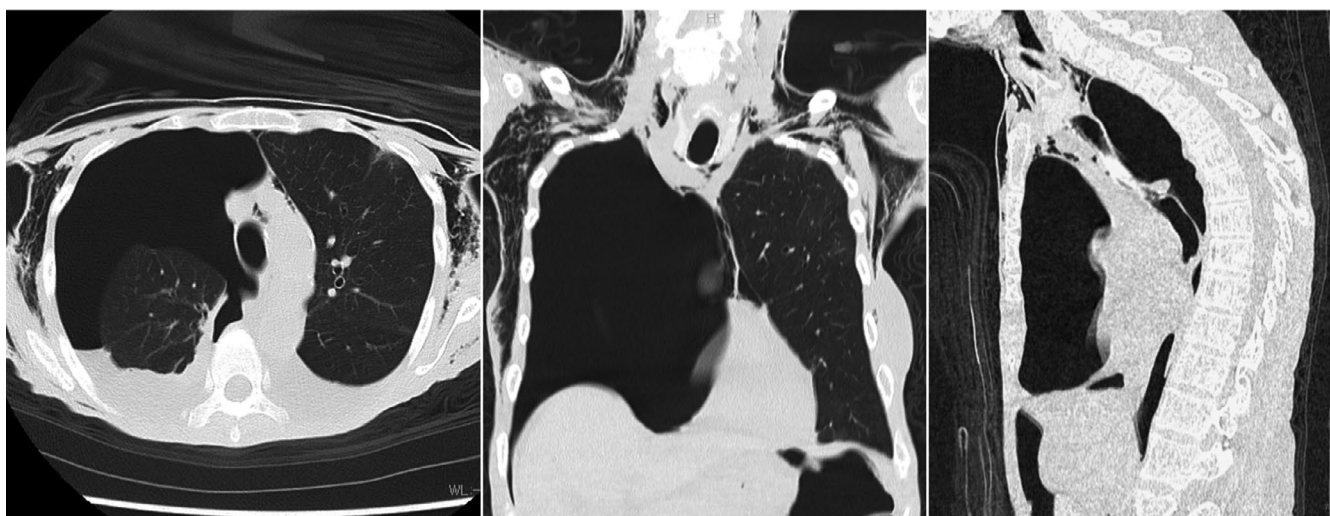
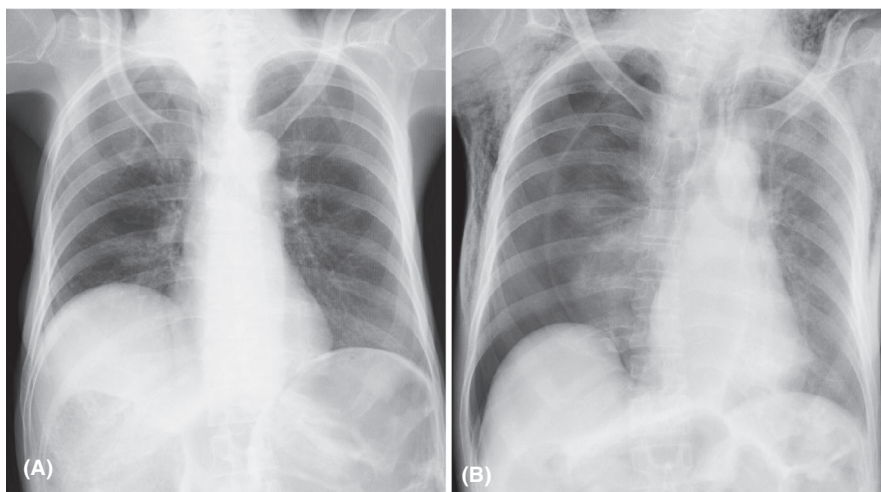
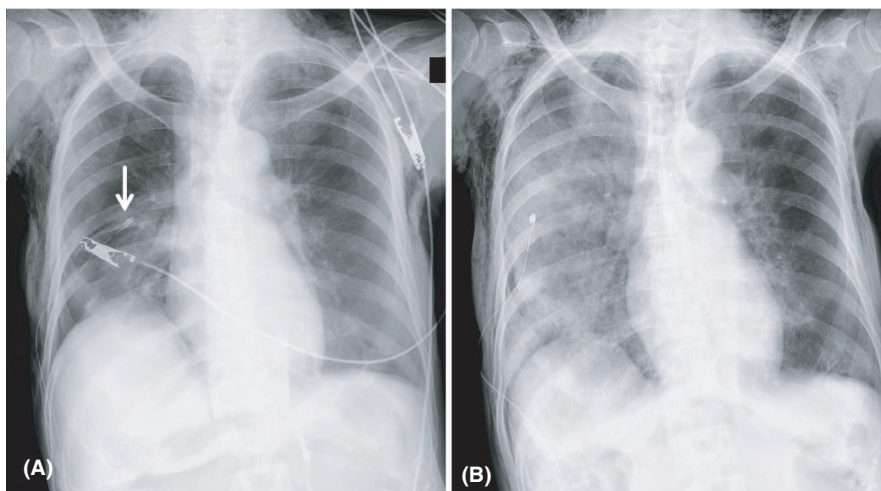


FIGURE 2 Chest computed tomography showing a severe right-sided pneumothorax, a large subcutaneous emphysema, and upper pneumomediastinum

FIGURE 3 A, Rapid improvement in pneumothorax after thoracic drainage (arrow) was verified by chest X-ray. B, Right-sided re-expansion pulmonary edema appeared 6 h after drainage



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CONFLICT OF INTEREST

The authors have no conflicts of interest to declare regarding to this manuscript.

AUTHOR CONTRIBUTIONS

YK and YO: drafted the manuscript and obtained the pictures. YK, YO, AN, and NI: contributed to patient care. KK-K and JT: supervised the study and critically reviewed the manuscript. All authors wrote, proofread, and approved the final version of manuscript.

DATA AVAILABILITY STATEMENT

None.

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