Pneumopericardium: A Rare but Lethal Complication in Medical ICU

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A 64-year-old man had a history of lung squamous cell carcinoma stage IV, a four-month history of pulmonary tuberculosis under treatment with standard anti-tuberculosis agents, and a history of right-side empyema status post video assisted thoracoscopic decortication about ten months prior to this visit. He was admitted to our medical ICU because of bacterial pneumonia with septic shock and respiratory failure. Chest rontgenography revealed cardiomegaly (Fig. 1), and massive pericardial effusion was confirmed after transthoracic echocardiography. After pericardiocentesis and a pig-tail insertion with drainage of 1440 ml of bloody exudative fluid (protein 4.43 g/dL, LDH 1933 U/L, RBC count 555000/μL, WBC count 2400/μL, Neutrophil/Lymphocyte 57/32, CEA 1665.73 ng/mL), the ventilator weaning process was begun and smoothly completed the following day. Cytology report of the pericardial effusion revealed atypical cells with keratinizing cytoplasm, and immunohistochemical staining revealed CEA(+), E-cadherin (+),

Fig. 1 The chest rontgenography reveals cardiomegaly and bilateral reticulonodular infiltration
TTF-1 (-), P63 (-) and calretinin (-), indicating malignancy. Unfortunately, an abrupt onset of chest pain followed with massive hemoptysis occurred about 64 hours after the pig-tail had been inserted, and before it was removed. Bradycardia, then asystole soon developed. The pig-tail drainage bag became inflated with air during the course of cardiopulmonary resuscitation. The patient was dead 30 minutes later without restoration of spontaneous circulation; chest rontgenography taken later showed severe pneumopericardium (Fig. 2), along with a pericardial pig-tail catheter.

Three most prevailing mechanisms leading to pneumopericardium were proposed previously\(^1\). The first is pneumothorax with simultaneous traumatic pericardial tear. The second is related to ventilator-induced lung injury that brings about pneumomediastinum and then extending to pneumopericardium. The third mechanism is pericardium perforation with communication to respiratory or gastrointestinal tracts. Pig-tail catheter dislodgement after pericardiocentesis leading to direct pleuro-pericardial communication and tension pneumopericardium may be the main problem this patient encountered. Though very rare, regardless of before or after removal of the pericardiocentesis drainage catheter, we should pay more attention to the patients who concurrently use the mechanical ventilation.

Reference