A 58-year-old male patient with noncomplicated alcoholic liver disease presented with a right upper parahilar pulmonary mass after minor blunt chest trauma. After an appropriate workup, non-small cell carcinoma of the lung was diagnosed. A right intrapericardial pneumonectomy was performed. A silastic chest drain with no negative pressure was left connected to a compensatory post-pneumonectomy system. The patient was extubated 30 min after the operation. A few minutes later while in the recovery room, the patient developed atrial fibrillation with fast heart rate of 150 beats/min. Digoxin and amiodarone were started. Shortly thereafter, ventricular fibrillation required a 300-J/s direct current shock. The patient was intubated again, and cardiopulmonary resuscitation was performed. Complete atrioventricular block developed, and a percutaneous transjugular right ventricular pacing lead was inserted. A chest radiograph demonstrated mediastinal shift toward the pneumonectomy side (Fig 1).

What is the diagnosis?
Diagnosis: Cardiac herniation

The patient was positioned on the left side, and his condition improved. The decision was immediately made to reopen the chest. Left atrial herniation was apparent through the pericardial gap. It was easy to replace the heart to its normal position because of the wide opening, which was closed with a running polypropylene suture.

Twenty-four hours after reopening, the patient required a second exploration due to cardiogenic shock. A chest radiograph showed a right white hemithorax. A massive clot was found, and no specific bleeding site was confirmed. The patient was extubated on the third postoperative day and discharged from the ICU.

Discussion

Cardiac herniation is a rare and life-threatening event with a mortality rate from 50 to 100%, as reported in the literature. It occurs in association with congenital pericardial defects and traumatic disruption of the pericardial sac. It is also seen as a complication of pulmonary surgery, especially intrapericardic pneumonectomy without closure of pericardial defect or lobar resection with pericardial opening. It appears to be related to negative intrapleural pressure, positive-pressure breathing, or changes in the position of the patient.

The sudden onset generally occurs within 24 h after surgery, and the symptoms are related to the side of herniation. On the left side, symptoms will result from strangulation of the ventricle and they may include dysrhythmia, myocardial ischemia, hypotension, and shock. In the case of herniation on the right side, a superior vena cava syndrome caused by torsion of this structure may ensue, resulting in a reduction of venous return, although outflow tract obstruction may also exist.

We can conclude that any patient who has had a pneumonectomy or a partial lung resection in which the pericardial gap has not been closed can present with this fatal entity. The patient must be closely followed to detect any hemodynamic disturbance or cardiac dysrhythmia, keeping in mind this possibility.

Differential diagnosis includes massive intrathoracic hemorrhage, atelectasis of the remaining lung tissue, and pulmonary embolism. The importance of early diagnosis and immediate surgical treatment with relocation of the heart to its anatomic position and repair of the pericardial defect, either primarily or by using autologous or prosthetic material, is a key issue in the outcome of the patient.

References