Post-pneumonectomy spontaneous pneumothorax is fortunately a very rare condition. We describe herein a late spontaneous right pneumothorax case occurring in a post-pneumonectomy patient and treated by thoracotomic bullectomy.

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Keywords: Pneumonectomy; Pneumothorax; Bullectomy

1. Case report

A 77-year-old male underwent left pneumonectomy plus complete mediastinal lymph node dissection in March 2002 for a non-small cell lung cancer (adenocarcinoma) with clinical stage T3N0M0.

Post-operative course was uneventful. Chest drain was removed on the fourth day and patient was discharged on the ninth day.

No adjuvant radiation or chemotherapy was indicated. Thirty-day functional status was as following: forced vital capacity (FVC): 1.28 l (53% predicted value); forced expiratory volume 1 second (FEV1): 0.85 l (42% predicted value); FEV1/FVC ratio: 65,83 (81% predicted value); blood gases analysis—FiO2: 21%: paO2: 62.7 mmHg; paCO2: 41.6 mmHg; SaO2: 82%; pH: 7.442.

After 4 months, the patient experienced a severe dyspnoea and cyanosis and was admitted to the emergency department of another hospital. Right subcutaneous emphysema was evident at hospital admittance. A chest X-ray showed a right pneumothorax and a chest tube was inserted with prompt, but partial, symptom relief. Patient’s condition was sub-critical but not enough to indicate intensive management. The control chest X-ray showed a persistent pneumothorax with mildly reduced subcutaneous emphysema. Continuous aspiration was applied. The patient needed continuous oxygen administration, as well.

Daily chest X-rays showed persistent stable pneumothorax with mildly reduced subcutaneous emphysema. Clinically, a persistent air leak was present and aspiration could not be discontinued due to quick deterioration of symptoms and re-appearance of subcutaneous emphysema.

The tenth day after the chest tube positioning the patient was transferred to our Division for further evaluation and treatment.

Clinical and radiological status did not show any significant improvement in the following 4 days and blood gas analyses showed a mild, but constant, deterioration of oxygen levels (nadir PaO2: 53.2 mmHg, paCO2: 46.2 mmHg, SaO2: 76%). Thus a surgical approach was indicated. Due to the fact that the lung never reached the chest wall the option of talc pleurodesis through the chest drain (‘talc slurry’) has not been taken into consideration.

In lateral decubitus, a video-assisted approach was attempted. Intermittent ventilation with hyperoxygenation was adopted. Due to the critical pulmonary status of the patient, periods of apnoea were very short; moreover, the limited parenchymal collapse impaired the exploration of the pleural cavity. Thus the video-assisted procedure was terminated.

A 10-cm right lateral thoracotomy was performed. A single broken bulla was present in the apical segment of the upper lobe. No other sources of air leakage were detected.
A limited wedge resection of the area containing the bulla was performed with two GIA 60 mm staples. The effectiveness of the aerostasis was intra-operatively checked.

A small amount of talc (2 g) was insufflated so as to cover the apical region of the lung.

A chest tube was placed and the thoracotomy routinely closed.

In the immediate post-operative period, the patient was transferred to the Post-Anesthesia Care Unit and intensive monitoring applied.

From the very earliest post-operative timing, no persistent air leak was detected; however, a mild (10–12 cm water) continuous aspiration was applied to the chest tube.

Subsequent post-operative period was uneventful. Chest X-ray controls showed a complete pulmonary re-expansion with resolution of the subcutaneous emphysema and significant improvement of the symptoms (Fig. 1 part b). The chest tube was removed on the sixth post-operative day and the patient was discharged on the tenth day. The 30-day control chest X-ray (Fig. 2) showed no sign of pneumothorax or subcutaneous emphysema. The patient is now alive and well and his quality of life is good.

2. Comment

Early and late post-pneumonectomy morbidity can be extremely high (40–60%) [1]. Among the other morbidities, spontaneous pneumothorax is an extremely rare condition, and, to the best of our knowledge, only two cases have been described, to date, in the English literature and an overall incidence figure of 0.1% can be assumed [2,3]. In both cases, it occurred early in the post-operative period and was treated by chest drain only.

This condition is critical and correlated with a very high mortality rate (more than 50%) [3].

In the case we report, we could not manage the persistent air leak condition by means of chest drain only and the surgical approach was indicated due to the fact that no other therapeutic options were available. Moreover, the patient’s general status was rapidly deteriorating.

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In the case we report, we could not manage the persistent air leak condition by means of chest drain only and the surgical approach was indicated due to the fact that no other therapeutic options were available. Moreover, the patient’s general status was rapidly deteriorating.
Since this condition is very rare, there is no standard treatment. In fact, to date, no data regarding persistent air leak following chest tube placement in post-pneumonectomy pneumothorax have been reported. We hope this short commentary can give the thoracic surgeon incentive to consider the surgical approach among the possibilities for managing such a condition.

References


Appendix A. ICVTS on-line discussion

Author: Dr. Sameh Sersar, Assistant Lecturer of Cardiothoracic Surgery, Department of Cardiothoracic Surgery, Mansoura University, Mansoura, Egypt

Date: 27-Jul-2003

Message: The title is not indicative enough: it would be more indicative if contralateral was added before spontaneous pneumothorax. Second, I would not have waited for 14 days to open this patient. I think it was too late.

Response

Author: Dr. Alfredo Cesario, Catholic University, Department of Surgical Sciences, Largo Agostino Gemelli, I, Rome, 00168 Italy

Date: 07-Aug-2003

Message: I do not agree with the fact that “contralateral” should be added in the title. If pneumothorax occurs after a pneumonectomy it is absolutely clear that it could be contralateral only.

The period in between the pneumothorax occurrence and the surgical treatment consisted of a post chest drain positioning time (is there a ‘state of the art number of days’ to allow a possible solution by means of chest drain only in this condition?); given the persistence of the PNX, the decision to transfer the patient in our hospital took-up some additional time. Therefore, the decision to operate has been confirmed only when it was clear that the simple chest drain would have not resolved the case.

Whilst we may agree that a quicker surgical indication could be better if and when the general condition of the patient became poorer and poorer, on the other hand we have to keep in mind that, as we already stated in the paper comment, there is no standard treatment for this kind of condition and surgical indication may carry important co-morbidities. In this setting, and without a ‘state of the art’ referring procedure, the less aggressive and proportionate approach seems to be recommended. Anyway, in the only case we have observed (and reported) the clinical and surgical timing and workup produced a successful outcome.