initiation of therapy with losartan, or after potentiation of its effects by increasing contemporaneous diuretics, to detect a deterioration in renal function at an early stage before acute renal failure is established and dialysis required.

Note added in proof: Another case of losartan-induced azotaemia has now appeared in print.⁵ It concerns a diabetic with no angiographic signs of transplant renal artery stenosis.

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Spontaneous contralateral pneumothorax following pneumonectomy

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Summary

A case of a spontaneous pneumothorax occurring three days post-pneumonectomy is presented. Difficulties in diagnosis and management are discussed.

Keywords: pneumonectomy, spontaneous contralateral pneumothorax

We report on a rare complication following pneumonectomy with potentially fatal consequences.

Case report

A 65-year-old man underwent a routine left pneumonectomy for squamous cell carcinoma. His early post-operative recovery was uneventful. His post-operative chest X-ray demonstrated satisfactory accumulation of fluid in his pneumonectomy space and good expansion of his remaining lung (figure 1). On the third post-operative day, while undergoing chest physiotherapy, he suddenly developed a cough productive of copious, frothy, blood-stained sputum and became short of breath.

On initial examination he was found to be sweaty with a pulse of 100 beats/min, respiratory rate 30 breaths/min, blood pressure 179/100 mmHg and oxygen saturation 96%. He became increasingly unwell and his oxygen saturation dropped to 77%. His jugular venous pressure was noted to be elevated on the right and he had reduced air entry on this side. A chest X-ray performed on the ward within minutes confirmed the clinical findings of a right pneumothorax (figure 2), the fluid level in his pneumonectomy space was unchanged

from that morning's X-ray. He immediately improved following insertion of a right-sided chest drain. Twenty-four hours later he developed subcutaneous emphysema, therefore a bronchoscopy was performed, demonstrating a healthy intact bronchial stump on the left side and a normal right bronchial tree. His subcutaneous emphysema gradually settled. Tetracycline pleurodesis was performed on three consecutive days. The chest drain was subsequently removed and chest X-ray showed no residual pneumothorax. He was discharged home on his ninth post-operative day.

Discussion

Contralateral pneumothorax following pneumonectomy is rare. Blalock reported four cases complicating 340 pneumonectomies and Har-

Figure 1 Chest X-ray on the morning of the third post-operative day

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man reported one case in 351 pneumonectomies; other smaller series have not reported this complication.^{1,2} Of the handful of cases reported,³⁻⁷ the overall mortality approaches 50%. Mechanisms of pathogenesis include intra-operative damage to the contralateral mediastinal pleura and rupture of an emphysematous bullae/bleb. The majority of cases occur in the immediate post operative period. Delayed diagnosis is the usual cause for the high mortality, therefore a high index of suspicion is required if this mortality is to be reduced.

Conscious patients (as opposed to those in whom a pneumothorax occurs while under general anaesthetic) may present in a similar manner to those suffering a pulmonary embolus,³ typically complaining of difficulty in breathing, chest pain, cough and demonstrating a tachycardia and cyanosis. Our case presented with coughing followed by production of copious, frothy, blood-stained sputum and increasing shortness of breath. Acute bronchopleural fistula was therefore an additional potential diagnosis in this patient.

In order to prevent overflow of pneumonectomy space fluid into the remaining lung the immediate management of an acute bronchopleural fistula necessitates lying the patient on his operated side. Subsequently a chest drain ought to be inserted followed by the appropriate definitive procedure. The immediate management of an acute bronchopleural fistula clearly differs from that of a tension pneumothorax. Inappropriate needle thoracocentesis on the remaining lung post-pneumonectomy could have serious consequences. The availability of immediate chest X-ray was therefore useful to confirm the diagnosis, however, such facilities are not always immediately available and a high index of suspicion must be maintained if the correct diagnosis is to be made and appropriate treatment instigated.

In the general population, spontaneous pneumothorax can be treated conservatively by expectant observation, aspiration, or chest drain insertion, with a recurrence rate of 30 to 50%.⁸ However, recurrence of a pneumothorax

Figure 2 Chest X-ray demonstrating a 50% right pneumothorax. The fluid level in the left pneumonectomy space is unchanged from figure 1

Summary/learning points

- contralateral pneumothorax is a rare and potentially fatal complication following pneumonectomy
- a high index of suspicion is required to make the correct diagnosis
- the differential diagnosis includes pulmonary embolus, acute bronchopleural fistula and tension pneumothorax
- chemical pleurodesis can be a simple and effective measure in cases with no major air leak

in this patient would be potentially fatal therefore such conservative measures alone are inappropriate. In this patient operative intervention was not feasible, therefore tetracycline pleurodesis, which is more effective than the above conservative measures at preventing long term recurrence,⁹ was carried out on three consecutive days.

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