Singapore Med J 2004 Vol 45(12) : 594

Fibrinolysis of loculated pleural effusion in malignant mesothelioma

T Balamugesh, D J Christopher, T Rajesh, J Prince

ABSTRACT

Surgical resection is not feasible in most cases of malignant mesothelioma and palliation of symptoms remains the mainstay of treatment. When a pleural effusion is loculated, the standard treatment methods of intercostal tube drainage and pleurodesis may not be helpful. We report a 49-year-old man with malignant mesothelioma in whom intrapleural fibrinolysis was performed using streptokinase. It was successful in breaking the locules and draining the effusion. Intrapleural fibrinolysis should be considered in cases of loculated pleural effusion due to malignant mesothelioma, as it may provide symptom relief and palliation.

Keywords: fibrinolysis, mesothelioma, pleural effusion, streptokinase

Singapore Med J 2004 Vol 45(12):594-595

INTRODUCTION

Surgical resection is not feasible in most cases of malignant mesothelioma and palliation of symptoms remains the mainstay of treatment. For those with symptomatic pleural effusion, intercostal tube drainage and pleurodesis are usually attempted. However, when the effusion is loculated, these methods may not be helpful. In loculated effusions due to malignant mesothelioma, the usefulness of intrapleural fibrinolysis has not been reported before. Intrapleural fibrinolysis has been reported to be useful in the management of loculated malignant pleural effusion due to metastatic carcinoma. However, its role in the treatment of loculated pleural effusion due to mesothelioma is not well-documented.

CASE REPORT

A 49-year-old man was admitted with exertional dyspnoea, cough and left-sided chest pain of five months duration. He had worked in a pipe-making factory for a few years about 25-30 years ago and smoked occasionally. On evaluation at a local hospital, he was found to have a rapidly-accumulating left-sided pleural effusion. Hence, an intercostal chest tube was inserted and he was referred to the Christian Medical College hospital for further management. On examination, he was found to have central cyanosis and signs of massive left-sided pleural effusion with mediastinal shift to the right side, which was confirmed by the chest radiograph (Fig. 1). The fluid column in

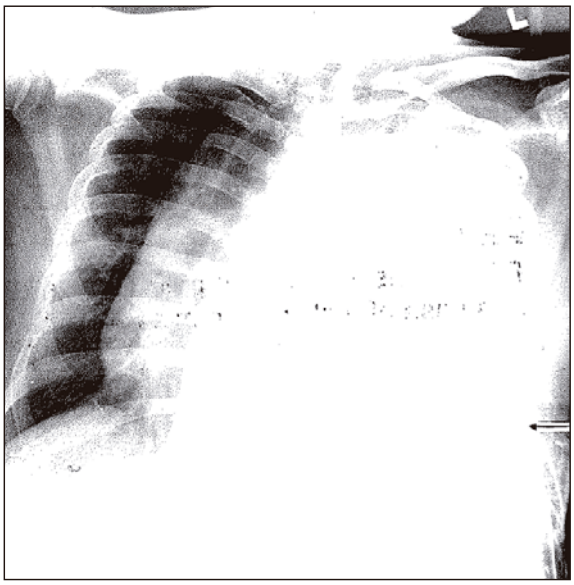

Fig. 1 Chest radiograph shows a massive left-sided pleural effusion with mediastinal shift. The intercostal tube is seen in- situ.

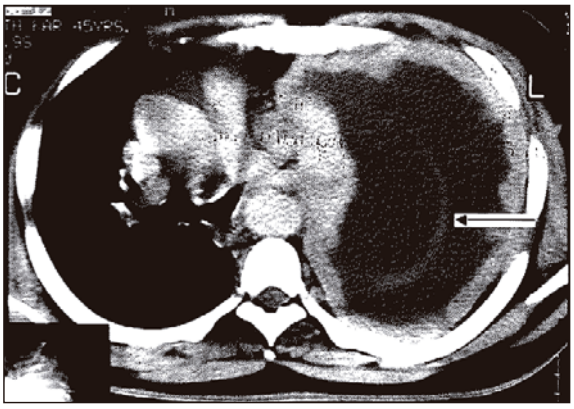

Fig. 2 Axial CT image shows gross left-sided pleural effusion, nodular pleural thickening and septations (arrow).

Department of Pulmonary Medicine
Christian Medical College
Ida Scudder Road
Vellore
Tamil Nadu 632004
India

T Balamugesh, MBBS, MD, DM
Lecturer

D J Christopher, DTCD, DNB, FCCP
Professor and Head

T Rajesh, MBBS, MD, DNB
Lecturer

J Prince, MBBS, MD
Tutor

Correspondence to:
Dr Thangakunam Balamugesh
Tel: (91) 416 2282859
Fax: (91) 416 2232035
Email: drbalamugesh@cmcvellore.ac.in

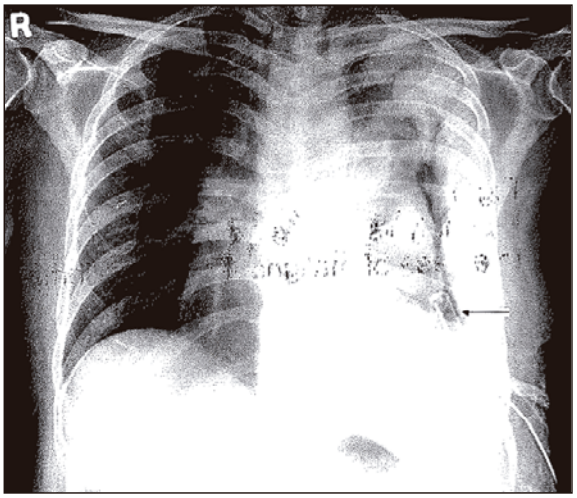

Fig. 3 Follow-up chest radiograph shows nodular pleural thickening after successful fibrinolysis with streptokinase. Tip of the chest tube is arrowed.

the water seal bottle of the intercostal drainage system was moving with respiration, suggesting that the chest tube was patent. Computed tomography of chest showed thickened and nodular pleura, which also involved the mediastinal aspect (Fig. 2).

Pleural fluid was haemorrhagic and atypical cells were seen on cytology examination. Pleural fluid culture grew Pseudomonas and coagulase-negative *Staphylococcus aureus*. Closed pleural biopsy was done and histopathology examination revealed malignant spindle cell tumour suggestive of mesothelioma. Fibreoptic bronchoscopy showed no endobronchial lesion and examination of the bronchoalveolar lavage fluid was negative for malignant cells. There was no drainage through the chest tube. Ultrasonography of the chest showed multiple thick-walled locules.

A 32F intercostal chest tube was reinserted into the largest locule, but there was still no drainage. Intrapleural fibrinolysis was attempted with 2.5 million units of streptokinase, diluted in 100ml normal saline. This was instilled through the intercostal tube for seven consecutive days. The amount of pleural fluid drainage increased dramatically to 1.5 L on the first day, and 500 to 700ml a day subsequently. Chest radiographs showed a decrease in the size of the effusion, with the mediastinum moving back to the midline. (Fig. 3). The patient improved, with a reduction in dyspnoea and disappearance of cyanosis. Pleurodesis was attempted with oxytetracycline and subsequently, talc slurry. However, it was not successful. The patient had marked symptomatic improvement at discharge. He was discharged on intercostal tube drainage.

DISCUSSION

Intrapleural fibrinolysis is an established modality in the management of complicated parapneumonic effusions and empyema[1]. The use of fibrinolytic agents is a recent development in managing multiloculated malignant effusions. Davies et al reported that intrapleural streptokinase increased pleural fluid drainage and led to radiographical improvement and amelioration of symptoms in patients with multiloculated or septated malignant effusions[2]. Intrapleural streptokinase was well tolerated and no allergic or haemorrhagic complications were reported. Gilkeson et al treated 22 malignant pleural effusions with and without radiographic evidence of loculations with urokinase, which resulted in a substantial increase in pleural fluid output in patients[3]. The majority then underwent pleurodesis with doxycycline, resulting in a complete response rate of 56%. Recently, the British Thoracic Society recommended intrapleural instillation of fibrinolytic drugs to relieve distressing dyspnoea due to malignant multiloculated effusion that is resistant to simple drainage[4].

Over 95% of patients with mesothelioma will develop pleural effusion with symptomatic dyspnoea that may require chest tube drainage. In those with loculated effusions, chest tube drainage may not be successful – as in our case – and the usefulness of intrapleural fibrinolysis has not been previously reported in mesothelioma. We have demonstrated that palliation of symptoms could be achieved with intrapleural fibrinolysis. Achieving complete visceral and parietal pleural apposition is crucial for the success of pleurodesis. With advancing disease, where the tumour involves the visceral pleura, the underlying lung may become trapped. In such circumstances, attempts at pleurodesis will be unsuccessful which happened in the index case. In conclusion, intrapleural fibrinolysis should be considered in cases of symptomatic, loculated pleural effusions due to mesothelioma since it may provide symptom relief and palliation.

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