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Re-Expansion Pulmonary Oedema: Conservative Management & Favourable Outcome

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Abstract: We present a case of re-expansion pulmonary oedema manifest during drainage of a large malignant pleural effusion managed by prompt supportive measures without need for invasive ventilation aids or pharmacological therapy. Conservative therapy was followed by favourable clinical outcome.
Keywords: Re-expansion, Pulmonary oedema, Pleural effusion, Malignant, Conservative, Supportive

INTRODUCTION

Re-expansion pulmonary oedema (REPO) is an uncommon clinical entity characteristically occurring after pleural drainage for pneumothorax or effusion. Treatment of documented cases has variously included non-invasive continuous positive airway pressure [1] as well as invasive mechanical ventilation [2] with outcomes ranging from full recovery to fatality, the latter quoted at 20% in one case review [3].

We present an interesting case of re-expansion pulmonary oedema following Seldinger chest drain insertion for recurrent malignant pleural effusion managed with minimal supportive therapy and followed by good clinical outcome.

CASE REPORT

A 55-year-old lady with history of recently diagnosed Stage IV right sided bronchogenic adenocarcinoma presented to the Casualty department of our hospital with a three day history of increasingly distressing dyspnoea at rest. Chest radiography revealed a recurrent right sided pleural effusion occupying lower, middle and upper lung fields (Fig. 1), similar to that which the patient had presented with four weeks previously when her malignancy was initially diagnosed. This initial exudative effusion was less extensive than her current presentation, and treated with thoracocentesis by Seldinger chest drain insertion over the course of one day.

Following diagnosis of recurrent pleural effusion at Casualty, the patient was admitted under pulmonology care and Seldinger chest drain insertion employed at the right anterior axillary line in the fourth intercostal space. One hour after drain insertion and removal of 1.5L serosanguinous fluid the patient developed acute dyspnoea and tachypnoea, with desaturation to 85% SpO_2 accompanied by profound hypotension at 65mmHg systolic pressure and tachycardia of 120bpm.

Bedside chest radiography supported diagnosis of right sided re-expansion pulmonary oedema together with minimal pneumothorax (Fig. 2) in keeping with wet crepitations to upper zone level identified on clinical examination. High flow oxygen therapy at 12L/min via non-re-breather mask and fluid resuscitation with one litre of colloid on the ward allowed for rapid stabilisation of the patient's clinical condition without need for any positive airway pressure support or invasive ventilation as reported in other cases of post-drain insertion REPO documented in the literature. One hour after initial onset of distress, the patient's dyspnoea and tachypnoea had all but resolved, with haemodynamic stability and favourable oxygen saturation of >95% SpO_2 on 3L/min oxygen supplementation via nasal prongs. The patient was nursed in the left lateral position throughout.

No diuretic stimulant therapy was administered and no artificial supplementation of ventilation applied. Controlled intermittent pleural drainage of no more than 500ml/hr of pleural fluid was undertaken until dryness was achieved, with the patient undergoing a short period of convalescence during which no further oxygen therapy or resuscitative measures were required and total radiological resolution of pulmonary oedema noted prior to talc pleurodesis and uneventful discharge to palliative oncological care three days after presentation.

Fig. 1: Chest radiography revealed a recurrent right sided pleural effusion occupying lower, middle and upper lung fields

Fig. 2: Right sided re-expansion pulmonary oedema together with minimal pneumothorax

DISCUSSION

Re-expansion pulmonary oedema represents an iatrogenic condition which manifests as sequestration of large fluid volumes in the lung as a response to gross drainage of volume from within the pleural space. Proposed risk factors include younger age and increased duration of lung collapse (>72 hours) [4] as well as rapid lung expansion [3, 4].

A retrospective case series investigating spontaneous pneumothorax patients treated with tube thoracostomy demonstrated incidence of REPO at 15.6% with risk emphasised by increased duration or size of pneumothorax [5]. No such series of pleural effusion patients has thus far been reported.

Therapeutic options which have been described in the literature include active negative pressure, analgesia, diuretic stimulants and glucocorticoid therapy [3], although evidence remains anecdotal [4, 6].

CONCLUSION

Our experience of re-expansion pulmonary oedema following drainage of a malignant pleural effusion supports rapid high volume drainage as a risk factor for the condition. Paucity of data in cases of malignant effusions aside, early recognition and prompt management as advocated by other authors[4] in non-malignant effusion cases can precede timely stabilisation and recovery of the patient without need for invasive ventilation, stimulation of diuresis, or glucocorticoid therapy.

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