


Narrow-band imaging thoracoscopy in pleural amyloidosis

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Keywords

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Abstract

We report the case of a 68-year-old male non-smoker suffering from shortness of breath for 1 year. He was referred to our institution for a definitive diagnosis. Both chest X-ray and computed tomography scans showed bilateral hydrothorax with no pleural thickening. We performed flexi-rigid thoracoscopic pleural biopsy on the right side with a single port under local anaesthesia. Multiple white nodules were seen in parietal and visceral pleura, and these nodules were small and flat under white light. Narrow-band imaging demonstrated pathognostic findings on parietal pleura. Irregular dilative vessels were seen around these nodules. Subsequently, we performed parietal pleural biopsy for these nodules. Pathological examination with haematoxylin and eosin staining revealed eosinophilic matrix material depositions present in the pleural parenchyma and the vessel wall. These depositions were positive for Congo red stain and showed apple-green birefringence under polarized light. These findings were compatible with pleural amyloidosis.

Introduction

About 6% of primary systemic amyloidosis is complicated with persistent pleural effusions [1]. Histopathological evaluations are essential for definitive diagnosis of pleural amyloidosis. Conventional thoracoscopy is a useful procedure to obtain pathological specimens, but it is an invasive procedure compared with thoracentesis. We have been using flexi-rigid thoracoscopy under local anaesthesia for patients with undiagnosed pleural effusions for many years [2]. We present a novel case of diagnosed pleural amyloidosis by flexi-rigid thoracoscope under local anaesthesia.

Case Report

A 68-year-old male non-smoker was suffering from shortness of breath for 1 year. Chest X-ray revealed bilateral pleural effusions diagnosed at a previous clinic. He was treated with diuretics for 3 months; however, the bilateral

pleural effusions remained. He was referred to our institution for a definitive diagnosis.

Oxygen saturation was 97% at room air, and his respiratory rate was 24/min. On physical examination, decreased breath sounds were heard at the base of both lungs. Laboratory examination revealed a white blood cell count of 4800/ μL , red blood cell count of $402 \times 10^4/\mu\text{L}$, haemoglobin of 13.2 g/dL, and a platelet count of $20 \times 10^4/\mu\text{L}$. Serological examinations revealed that C-reactive protein was 3.35 mg/dL, creatinine was 1.39 mg/dL, total protein was 6.6 g/dL, albumin was 3.4 g/dL, and brain natriuretic peptide was 194.8 ng/mL. Serum levels of tumour makers did not reveal any abnormalities. Serum protein electrophoresis revealed an IgM Lambda monoclonal protein. Both chest X-ray and computed tomography (CT) scans showed bilateral hydrothorax with no pleural thickening (Fig. 1A). Echocardiogram demonstrated an ejection fraction of 64% and a small pericardial effusion.

Thoracentesis was performed for the right pleural effusion. Pleural fluids showed low adenosine deaminase

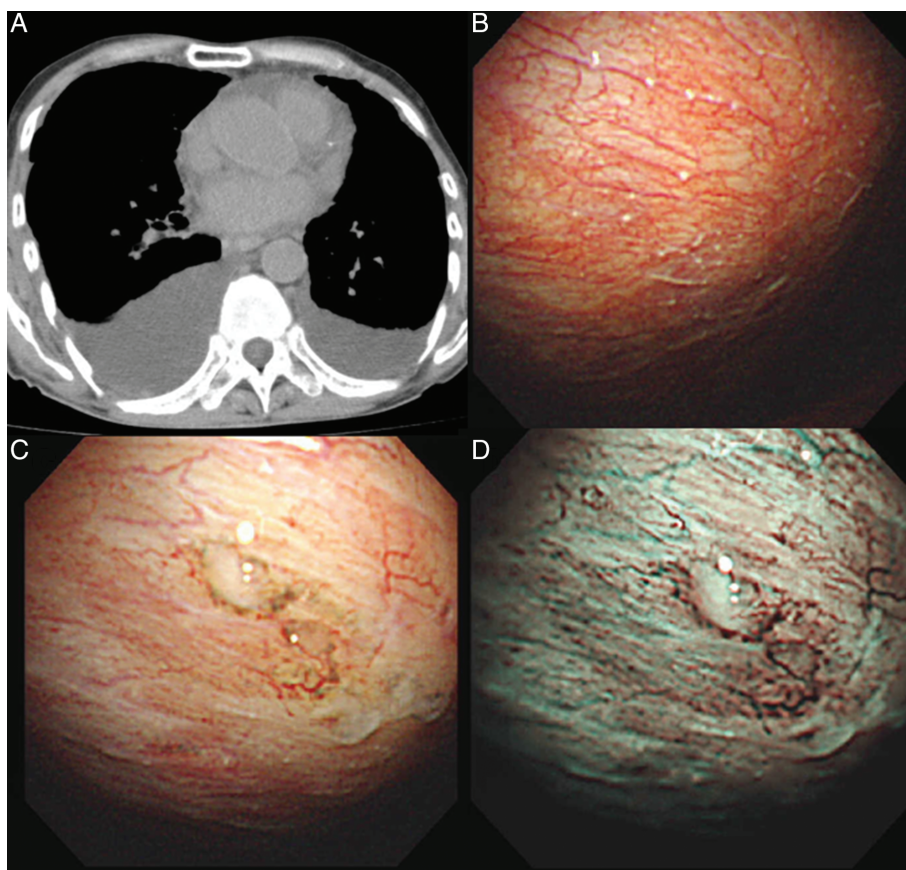


Figure 1. (A) Chest computed tomography (CT) showed bilateral hydrothorax with no pleural thickening. (B, C) Multiple white nodules were seen in visceral pleura with white light (WL). (D) Narrow-band imaging (NBI) demonstrated dilative vessels that were seen around nodules.

(ADA) and exudative effusion (lymphocytes accounted for 75%). The pleural fluid cytology did not reveal any malignant cells. Multiple acid-fast bacilli smears and cultures of pleural fluid were also negative. We performed flexi-rigid thoroscopic pleural biopsy on the right side with a single port under local anaesthesia. Multiple white nodules were seen in parietal and visceral pleura, and these nodules were small and flat under white light (WL) (Fig. 1B, C). Narrow-band imaging (NBI) demonstrated pathognostic findings on parietal pleura (Fig. 1D). Irregular dilative vessels were seen around these nodules. We performed parietal pleural biopsy for these nodules.

Pathological examination was performed using haematoxylin and eosin staining, and eosinophilic matrix material depositions were present in the pleural parenchyma and the vessel wall (Fig. 2A). These depositions were positive for Congo red stain (Fig. 2B) and also showed apple-green birefringence under polarized light (Fig. 2C). These findings were compatible with pleural amyloidosis. Bone marrow revealed amyloid deposition and a mild plasmacytosis with under 10% of plasma cells. Biopsy tissue from the stomach and duodenum revealed amyloid deposition. His case was diagnosed as systemic AL amyloidosis.

Discussion

This is the first report to describe detailed thoroscopic findings of pleural amyloidosis using pleuroscopy with NBI. Pleuroscopy under local anaesthesia is a useful procedure to obtain pathological specimens with minimal invasiveness, but it is difficult to determine the optimal biopsy site [2]. We previously reported that NBI was useful in the selection of optimal biopsy sites by assessing vascular patterns in malignant lesions [3]. Irregular vascularity on NBI is often seen in malignant disease. NBI has been mainly employed for detecting pre-neoplastic and neoplastic lesions as it provides more detailed images of the microvasculature and angiogenesis processes.

Serrano-Fernández ML et al. [4] reported a case of bronchial amyloidosis. Using NBI, they assessed bronchoscopic findings of intrabronchial lesions in detail. NBI examination showed complex vascular networks, capillary loops, and abrupt-ending vessels of a large calibre in bronchial amyloidosis.

In our present case, NBI was useful to assess irregular vascularity around small pleural nodules. For pathological examination, amyloid depositions were present in the pleural vessel wall, but these vessels had maintained their

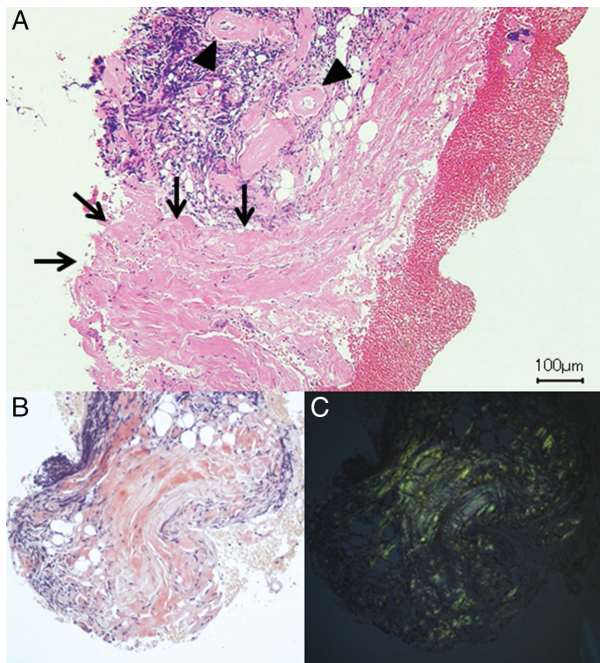


Figure 2. (A) Pathological findings revealed that eosinophilic matrix material depositions were present in the pleural parenchyma (arrows) and the vessel wall (arrow heads)(haematoxylin and eosin stain). (B, C) White light (WL) displayed multiple white nodules in visceral pleura. (C) These depositions showed apple-green birefringence under polarized light.

patency. The findings of dilative vessels and vascularity in NBI might reflect amyloid depositions in pleural vessels.

In patients with undiagnosed pleural effusions, pleural amyloidosis should be considered a differential diagnosis. Moreover, thoracoscopy with NBI was a useful

procedure to assess the findings of pleural amyloidosis in detail.

Disclosure Statement

Appropriate written informed consent was obtained for publication of this case report and accompanying images.

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