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CASE REPORT

A Rare Case Of Myelomatous Pleural Effusion

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SUMMARY

Myelomatous pleural effusion is a rare cause of pleural effusion in patients with multiple myeloma, with an incidence rate of 1-2%. The diagnosis is best appreciated on cytological examination. Visualisation of atypical and immature plasma cells in large numbers in the pleural fluid is characteristic, however may be easily missed in smears. We reported a case of a 61 years old gentleman of Malay ethnicity, with underlying refractory multiple myeloma, presented with worsening shortness of breath and found to have a left-sided pleural effusion. Pleural fluid from pleural tapping procedure was submitted for cytological examination. The pleural fluid showed singly scattered atypical plasmacytoid cells in close admixture with mesothelial cells and lymphocytes, which were more apparent on the cell block. Immunohistochemically, the plasmacytoid cells were positive for CD138 while scattered cells consistent with mesothelial cells were positive for calretinin. The patient was diagnosed with a myelomatous pleural effusion. The rarity of this finding and use of cell block to enhance the detection of the cells is highlighted.

INTRODUCTION

Multiple myeloma is a bone-marrow based, multifocal plasma cell neoplasm. Patients uncommonly present with pleural effusion. Furthermore, multiple myeloma itself is a rare cause of pleural effusion. The diagnosis of a myelomatous pleural effusion is best done on

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cytological examination. Visualisation of the atypical and immature plasma cells in large numbers in the pleural fluid is characteristic1. However, the malignant plasma cells may be missed in a smear, being mistaken for mesothelial cells or even normal plasma cell population.

CASE REPORT

A 61 years old gentleman of Malay ethnicity, with underlying refractory multiple myeloma, presented with worsening shortness of breath for two days. He had been diagnosed with multiple myeloma (IgA lambda subtype by serum electrophoresis) two years prior to the current admission. He received six cycles of chemotherapy and auto stem cell transplantation. Six months after the stem cell transplantation, he complained of bilateral lower limb weakness and numbness. Magnetic resonance imaging (MRI) spine done at the time showed extensive paravertebral metastases causing cord compression which was unsuitable for operative intervention. He then underwent palliative radiotherapy. During his current admission, he was found to have a left-sided pleural effusion. Pleural tapping was done and the pleural fluid was submitted for cytological examination.

Smears of the watery, blood-stained pleural fluid show singly scattered, atypical cells in close admixture with mesothelial cells and lymphocytes. (Figure 1). The cells have high nuclear to cytoplasmic ratio with either eccentric or central nuclei. The nuclei range from dense hyperchromatic to less mature coarse nuclear chromatin pattern (Figures 2,3). The background is blood-stained. No epithelioid granuloma is present.

Levels from the cell block show similar findings as the smears (Figure 4). Immunohistochemically, the plasmacytoid cells were positive for CD138 (Figure 5) and negative for CD79alpha, calretinin and equivocal for WT1. Scattered cells which were positive for calretinin were consistent with the mesothelial cell population (Figure 6). The patient was diagnosed with a myelomatous pleural effusion.

He was re-admitted for the same complaint about 2 weeks later. Computed tomography (CT) scan was done during the latest admission, and showed right lung nodules with the paravertebral mass extending from T11 to T12 indenting the left pleural surface. Another pleural tapping was done to relieve his symptoms and the patient subsequently discharged himself against medical advice.

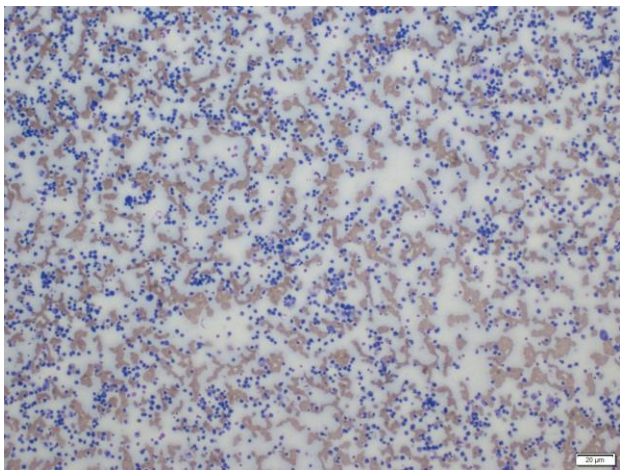

Figure 1: MGG stained smear. 100x magnification.

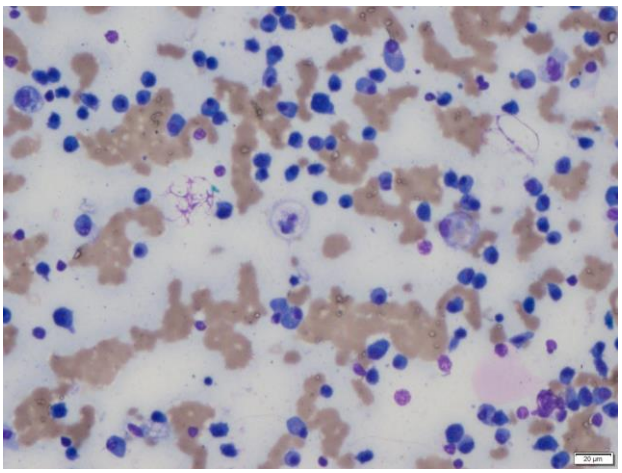

Figure 2: MGG stained smear. 400x magnification.

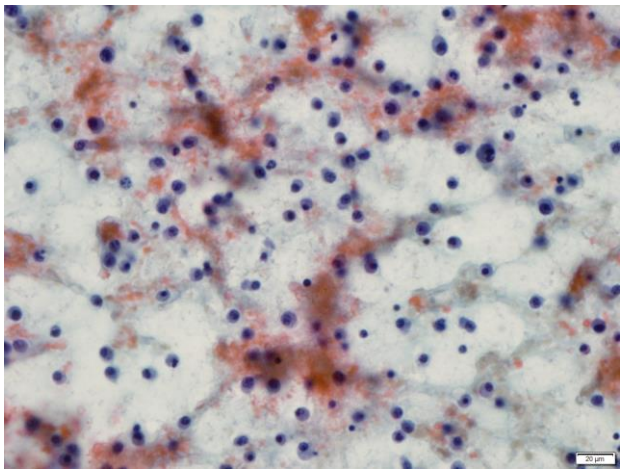

Figure 3: Pap stained smear. 400x magnification.

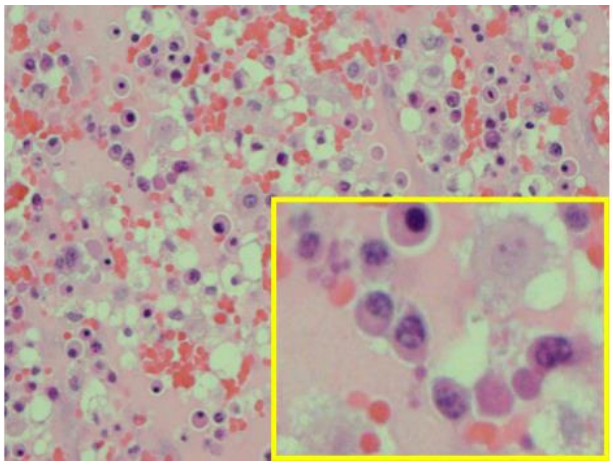

Figure 4: Cell block, H&E. 400x magnification. Inset: higher resolution.

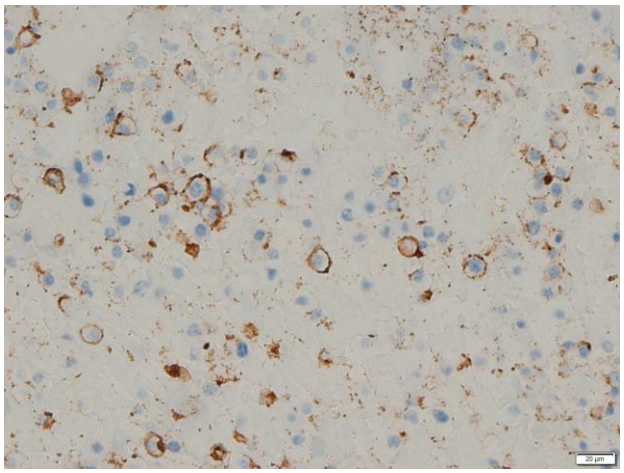

Figure 5: CD138 immunohistochemical stain. 400x magnification.

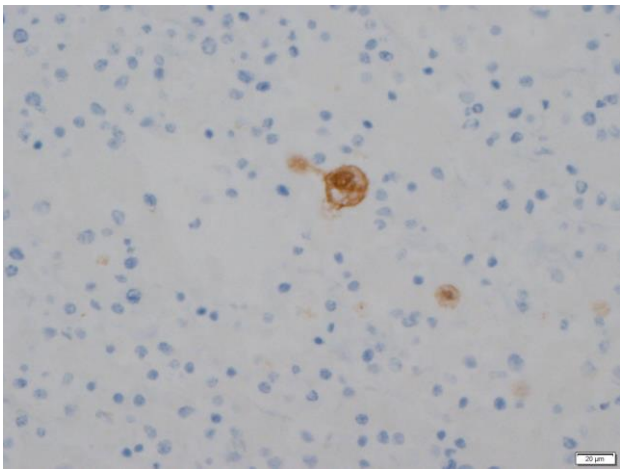

Figure 6: Calretinin immunohistochemical stain. 400x magnification.

DISCUSSION

Multiple myeloma, or plasma cell myeloma, is a bone-marrow based, multifocal plasma cell neoplasm due to monoclonal proliferation of transformed B cells which secrete immunoglobulin . Patients usually present with pathological fractures, bone pain, renal insufficiency and recurrent bacterial infections2. Pleural effusion is rarely seen in multiple myeloma, with the occurrence being about 6% of cases1. There have been a few case reports of an effusion itself being the initial presenting symptom leading to the diagnosis of multiple myeloma3,4. The common causes of pleural effusion in patients with multiple myeloma are usually benign, such as congestive heart failure, chronic renal failure, cardiac amyloidosis, hypoalbuminemia and infections5.

Myelomatous etiology of pleural effusion is rare, constituting approximately 1 to 2% out of the overall cases of multiple myeloma6. Most of the effusions are seen in IgA subtype of multiple myeloma4,5, which is the subtype in this case. The presence of a myelomatous effusion is of poor prognosis, with reported duration of survival of less than 4 months7. The proposed pathogenesis is either direct invasion from an adjacent skeletal lesion, extension from chest wall plasmacytomas or direct involvement of the pleura by myeloma6. In this case, the probable mechanism is direct invasion from the adjacent left thoracic rib lesions which are seen indenting the pleural surface.

The diagnosis of a myelomatous pleural effusion is best done on cytological examination. Direct visualisation of the atypical and immature plasma cells in large numbers confirms the malignancy1. Other methods, such as pleural biopsy, has the disadvantage of being invasive with possibility of missing the relevant site due to patchy tumour involvement8. In addition, the usage of cell block increases the sensitivity of diagnosis3. This is applicable to our case, as the malignant plasma cells are not readily obvious on the smears due to its close admixture with mesothelial cells which share similar cytological features. Thus, the diagnosis may be missed at scanning magnification on a smear, being mistaken for mesothelial cells or even normal plasma cell population. We find that the plasma cell morphology is better appreciated on the cell block preparation stained with haematoxylin and eosin, with the added benefit of application of immunohistochemical staining on the cell block material for confirmation.

CONCLUSION

We report a rare case of unilateral myelomatous pleural effusion in a patient with refractory multiple myeloma, diagnosed based on cytology. In addition, the usage of cell block greatly enhances the detection of this malignancy in the pleural fluid specimen.

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