Cytology of plasma cell rich effusion in cases of plasma cell neoplasm

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ABSTRACT

Background: Multiple myeloma or plasmacytoma resulting in malignant effusion is rarely described in literature.

Aims: In this paper, we have studied the seven rare cases of plasma cell infiltration in effusion fluid.

Materials and Methods: We studied six cases of pleural fluid and one case of ascitic fluid. Detailed cytological features, clinical history, bone marrow examinations, serum electrophoresis, and immunofixation data were analyzed.

Result: There were two cases of plasmacytoma, four cases of multiple myeloma, and one case of plasmablastic lymphoma. On cytology, all the cases showed excess plasma cells along with mesothelial cells and lymphocytes on effusion cytology smear.

Conclusion: Plasma cell rich effusion in cases of plasma cell tumor is rare. However, on cytology these cases do not pose much problem if relevant history is known.

Key words: Cytology; effusion; multiple myeloma; plasma cell; plasmacytoma

Introduction

Body cavities are the common sites of metastasis, and cytology smear of the effusion fluid often shows various metastatic lesions. The serous cavities are known to be involved in lymphomatous process with a incidence of 10-20%;[1,2] however, myeloma or plasmacytoma resulting in malignant effusion is rare with a frequency of 1-2% of all cases of myeloma.[3,4] The commonest cause of effusion due to plasma cell tumor is the secondary involvement of other organs like heart and kidney. The first case of pleural effusion due to myeloma was described by Rodríguez et al. in 1994.[5] In the present paper, we are describing seven cases of effusion, rich in plasma cells in cases of plasma cell tumors.

Materials and Methods

This study includes seven such cases of effusion rich in plasma cells over a period of 4 years (2010-2013). During this period, we had 2,215 samples of pleural fluid and 1,980 samples of ascitic fluid of which six pleural fluids and one ascitic fluid were rich in plasma cells. We retrieved the clinical history, course of disease, and other relevant investigation from the records of the patients and fine-needle aspiration cytology (FNAC), biopsy, bone marrow examination, serum protein electrophoresis, and immunofixation data were correlated with the effusion cytology features.

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Results

Table 1 shows detailed clinical and other relevant findings of the seven cases. The age of the patients ranged between 26 years and 78 years. There were five male and two female patients. Out of the seven patients, two cases were plasmacytoma [Figure 1], four cases were multiple myeloma on therapy, and one case was lymphoma [Figure 2]. Among the plasmacytoma patients one had involvement of the chest wall with pleural effusion while the other had involvement of the zygomatic bone with ascites and a mass in the pelvis that on FNAC showed infiltration by plasma cells. The case of lymphoma presented with a chest wall mass was diagnosed on FNAC as plasmacytoma. On histology, it was reported as plasmablastic lymphoma. Both these patients with chest wall masses presented with effusion during the primary diagnosis only while the patient with zygomatic plasmacytoma and the cases of multiple myeloma presented with effusion during the therapy. During the course of the disease, two of our patients had distant site involvement; one plasmacytoma case had developed pelvic adnexal mass with ascites while the case of lymphoma had involvement of the Psoas major muscle; both of which were confirmed on FNAC.

All the smears showed a marked increase in plasma cells along with lymphocytes and mesothelial cells in variable proportion. All the cases showed more number of mature plasma cells [Figure 3] and less number of immature/blast cells, but the case of plasmablastic lymphoma was highly cellular with the predominance of blastic morphology [Figure 4].

Bone marrow records showed no involvement of tumor in the cases of plasmacytomas, lymphoma, and two known cases of multiple myeloma during the presentation as pleural effusion. Both the cases of plasmacytoma were positive for monoclonal M band while the lymphoma patient was negative for M band.
Discussion

The incidence of plasma cell rich pleural effusion in our institute is around 1 in 370 samples (6/2,215) of pleural fluid. Two cases with chest wall pathology had local pleural infiltration, while one plasmacytoma case had a pelvic mass and presented with ascites.

Myelomatous effusion can result from the direct invasion of the plasmacytoma/lymphoma from the chest wall (as seen in two of our cases) or skeletal lesions or from a lymph node infiltration leading to poor lymphatic drainage. Previous studies have highlighted that the IgA kappa subtype to be associated with majority of pleural effusions ranging up to 80%. However, in the present study we demonstrated IgG kappa subtype on immunofixation.

Rarely tuberculosis (TB), viral infections, and Hodgkin lymphoma can show mild increase in plasma cells in effusion cytology. The reactive plasma cells should always be differentiated from the neoplastic plasma cells. The number of plasma cells in effusion fluid is more in neoplastic lesions than simple reactive process. Moreover, the presence of immature plasma cells with prominent nucleoli is indicative of plasma cell neoplasm. In doubtful cases of plasma cell rich effusion, one should always take a good clinical history along with the help of ancillary techniques. A good clinical history such as history of plasma cell neoplasm in other part/s of the body, or symptoms of back pain or lytic lesions in the skull, etc., may be very helpful. Ancillary techniques, such as flow cytometric immunophenotyping for plasma cell, may be helpful. The demonstration of higher number of CD 38 and CD 138 positive cell population in the sample is a helpful diagnostic finding of plasma cell neoplasm. In doubtful cases of plasma cell rich effusion, immunocytochemistry on cell block preparation of the effusion sample may also provide this information. However, the limitations of these ancillary techniques could be ill-preserved fluid samples and the lesser number of plasma cells in a particular sample. In addition, the cells also show light chain restriction. Immunocytochemistry on cell block preparation of the effusion sample may also provide this information. However, the limitations of these ancillary techniques could be ill-preserved fluid samples and the lesser number of plasma cells in a particular sample. In addition, the cells also show light chain restriction. Immunocytochemistry on cell block preparation of the effusion sample may also provide this information. However, the limitations of these ancillary techniques could be ill-preserved fluid samples and the lesser number of plasma cells in a particular sample. In addition, the cells also show light chain restriction. Immunocytochemistry on cell block preparation of the effusion sample may also provide this information. However, the limitations of these ancillary techniques could be ill-preserved fluid samples and the lesser number of plasma cells in a particular sample. In addition, the cells also show light chain restriction.
cells by local extension. Other cases may have involvement by circulating plasma cells. Myeloma, presenting initially as solitary pleural effusion, is rarely described.[10]

**Conclusion**

In conclusion, we described detailed cytological features, clinical history, and other relevant information in seven interesting cases of plasma cell infiltration of effusion in cases of plasma cell tumors.

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**Conflicts of interest**

There are no conflicts of interest.

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