A pleural effusion due to extramedullary pleural plasmacytoma: a case report

Enrico Balleari · Roberto G. Carbone · Marco Grosso · Riccardo Ghio

Multiple myeloma (MM) is a neoplastic disorder in which clonal malignant plasma cells accumulate in the bone marrow. Pleural effusions are occasional findings in patients with MM [1] and they may be secondary to a variety of causes. Here we describe a case of pleural myelomatous effusion due to an extramedullary plasmacytoma.

A 63-year-old woman was referred to our Unit because of progressive shortness of breath starting 1 month before admission. At that time she denied cough, fever, orthopnea, chest pain or palpitations. Three years prior to the current hospitalisation she was diagnosed as having a stage II A MM of IgA k type. After four cycles of chemotherapy with vincristine, Adriamycin, dexamethasone (VAD) regimen, a very good partial response was obtained, with minimal residual bone marrow plasma cell infiltration (less than 5%) and a >90% reduction of monoclonal protein at immunofixation. At that time she refused to undergo autologous bone marrow transplantation and the disease remained thereafter stable under continuous maintenance therapy with thalidomide, 200 mg p.o. daily.

On admission physical examination revealed a woman in no acute distress. Her physical examination was remarkable only for dullness above the left hemithorax with consensual diminished breath sounds. Laboratory data showed an erythrocyte sedimentation rate of 50 mm at the first hour, normal cell blood counts, normal serum chemistry and liver function test results. Serum electrophoresis and immunofixation confirmed the presence of an IgA kappa monoclonal component, which quantitatively (1,100 mg/dL) was approximately unchanged since the last control of the hematological disease, performed 4 months earlier. A chest X-ray (not shown) revealed a large left pleural effusion. Marked pleural thickening on the left side, which was partially infiltrating the chest wall, was seen on a contrast CT scan of the chest (Fig. 1).

A thoracentesis was performed and a large amount of pleural fluid was drained, which presented the characteristics of exudate. A cytological smear of the pleural liquid demonstrated a large number of atypical plasma cells, with many mitotic figures (Fig. 2a, b). After a thorough clinical work-up, no evidence of MM recurrence in the bone marrow was observed, leading to the diagnosis of pleural plasmacytoma with neoplastic pleural effusion. The patient underwent a new course of chemotherapy with VAD regimen, with a rapid resolution of the pleural effusion. At first pleural thickening also was reduced by chemotherapy, even if after 7 months disease progressed with both medullary and extramedullary involvement despite a salvage treatment with bortezomib and high doses of dexametazone. The patient died for progressive disease after 11 months from the first appearance of pleural effusion.

Multiple myeloma is a neoplastic disorder in which malignant plasma cells accumulate in the bone marrow and produce monoclonal immunoglobulins, usually of the IgG or IgA class. Common complications of overt MM include recurrent bacterial infections, anaemia, osteolytic lesions, and renal insufficiency [1].
Pleural effusions are occasional findings in patients with MM, occurring in approximately 6% of patients suffering from this disease [1]. A pleural effusion in MM may be due to a variety of causes including infectious complications, nephrotic syndrome, pulmonary embolism or congestive heart failure secondary to amyloidosis [1, 2]. A pleural involvement with myeloma cells infiltrating from adjacent skeletal or parenchymal structures can also cause pleural effusions, even if this occurrence is much more rare. Extramedullary involvement (plasmacytoma) can also occasionally occur, particularly in the nasopharynx, upper respiratory tract, or gastrointestinal tract.

Effusions due to pleural myelomatous involvement are very rare. A review of 958 patients from the Mayo Clinic reported pleural myelomatous involvement in 0.8% of MM cases [3]. Among 113 patients with plasmacytomas, 102 were intramedullary, and 11 extramedullary.

The majority of myelomatous effusions are due to MM of IgA type, as this class of MM tends to invade extra osseous structures. Our findings concord with the literature, in which 80% of myelomatous pleural effusions are due to MM of the IgA type. Nevertheless, in the case under discussion, the long-term (more than 2 years) thalidomide treatment might have had a possible favouring role for the extramedullary plasmacytic transformation of the disease in the absence of bone marrow myelomatous recurrence. Actually, extramedullary progression of MM despite a bone marrow response has been well described in patients treated with thalidomide for resistant MM [4].

Diagnosis of a myelomatous involvement of pleural fluid requires a positive electrophoresis of the pleural fluid or the cytological demonstration of atypical plasma cells in the fluid and excludes it from reactive or tuberculosis-associated effusions. All cases described by Palmer et al. [5] were diagnosed by either one or both methods. Cytology and flow cytometry confirmed malignancy in 87 and 90% of fluids evaluated, respectively [5]. In accordance to Palmer et al., our diagnosis was confirmed by a cytological examination of the pleural fluid. Vice versa Meoli et al. [6] suggest as alternative procedure the pleural biopsy specimen in the establishing the diagnosis of a myelomatous pleural effusion. In the case under discussion, a large amount of atypical plasma cells were observed by microscopical examination of pleural fluid cytocrinefugate, with an unusual frequency of mitotic figures. Other authors claim that pleural biopsies have a lower diagnostic yield due to patchy pleural infiltration by plasma cells [2].

Treatment of pleural effusions due to MM pleural myelomatous involvement usually requires chemotherapy directed to the primary neoplasm. In the case here reported treatment of the primary disease brought to rapid elimination of the pleural effusion, although it relapsed in a few months, as frequently occurs. In refractory cases pleurodiesis may be considered for symptomatic control.

In conclusion, myelomatous pleural effusion is a rare manifestation of MM, but it should be considered especially in those patients with advanced disease of IgA type and who underwent thalidomide treatment. The long-term use of thalidomide might in fact determine extramedullary...
progression of MM despite a good clinical response in the bone marrow [7]. A cytological examination of pleural fluid may rapidly confirm the diagnosis.

Conflicts of interest statement The authors affirm that there are no competing interests.

References