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Summary: Breast involvement by immunolymphoproliferative disorders is rare. Primary and secondary malignant lymphomas of the breast are much more common than multiple myeloma, of which only a few cases have been described. We report a case of a patient with an established diagnosis of multiple myeloma in whom breast involvement appeared after the completion of the treatment. We underline diagnostic difficulties caused by the lack of clinical and radiological features which allow us to differentiate between breast carcinoma and breast involvement by lymphoproliferative disease. Only fine needle aspiration and/or excisional biopsy can differentiate between immunolymphoproliferative disorders and epithelial or mesenchymal tumors of the breast.

I. Introduction

Multiple myeloma (MM) is the most frequent lympho-immunoproliferative disorders, but their localization in the breast is quite rare.

MM is a disseminated malignant B-cell lineage neoplasm, characterized by clonal proliferation of plasma cells in the bone marrow, associated with the overproduction of structurally homogeneous immunoglobulins (M-component). They represent the most frequent form of plasma cell dyscrasias and about 1% of all types of tumors [1]. The incidence increases progressively with age and the mean age at diagnosis is about 65 years, while the onset in children [2] and young adults before 40 years is very rare [3]. Impaired hemopoiesis, renal failure, osteolytic bone lesions, recurrent infections, hypercalcemia are the most common features of the disease. Clinically apparent extrasosseous manifestation are present in less than 5% of patients with multiple myeloma and are usually associated with more aggressive behaviour, resistance to treatment and shorter survival. Clinicopathologic studies, however, show extrasosseous involvement in about two third of the patients, liver, spleen and lymph nodes being the most frequent sites [4, 5]. Central nervous system, kidney, skin, pleura, lung, testes, pancreas, thyroid, adrenal glands and omental involvement have also been described. Few cases of breast multiple myeloma are reported in the literature [2, 6-14]. Ross et al. [15] described one case and reviewed 10 cases of multiple myeloma of the breast reported up to 1987. Furthermore, one case by Collins et al. [16] and two cases by Moulopoulos et al. [17] have been reported, the latter only as imaging features without any further information. More recently two cases have been described by Kim [18] and Ariad [19].

In this report we describe the case of a patient with established diagnosis of multiple myeloma treated with cytotoxic combination chemotherapy who developed breast involvement after completing the course of treatment of the disease. We discuss their initial management.

Case report

A 47-year-old man was diagnosed to have IgG (k)MM stage IIIA in 2010, and was treated with alternating cycles of VAD/MP (vincristine, adriamycin, dexamethazone-melphalan, prednisone) for a total of eight courses. After which he stopped treatment on the advice of the treating doctor and a normal electrophoresis. In 2013 the patient felt a mass in the right breast. At clinical examination there was a single palpable mass in the right (4.4 x 2.8 cm) Mammography showed single nodular mass. Ultrasound examination of the breast showed solid echo-poor mass with regular margins. Fine needle aspiration cytology showed immature nucleolated plasma cells. Excisional biopsy was performed, histological examination confirming the myelomatous nature of the mass. Microscopically the nodules were composed of tightly packed immature plasma cells infiltrating the stroma.
Some residual lobular glands were evident focally throughout the neoplastic infiltration. 

**Biopsy** revealed plasma cell tumor with eccentric atypical nuclei and abundant cytoplasm showing peri-nuclear halo, suggestive of metastatic deposits from multiple myeloma. 

Immunohistochemistry revealed positivity for KAPPA LIGHT CHAIN IHC, CD138 and KI67 confirming the diagnosis of Plasmacytoma.
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II. Discussion;

Ductal and lobular carcinoma are the most frequent malignant disease of the breast, while lymphoproliferative disorders and mesenchymal tumors are exceedingly rare. Patients affected by immunolymphoproliferative disorders, particularly when treated with chemotherapy, may develop secondary tumor in the breast. The appearance of breast nodules in patients with an immunoproliferative disorders make it mandatory to differentiate between primary breast cancer and a haematological malignancy. Multiple myeloma is a systemic disease which may involve extraosseous sites, but only in rare occasions has it been found in the breast. To date, we have only found very few case reports describing multiple myeloma involving the breast. Analysis of data reported in the literature are consistent with a lack of clinical or instrumental features that allow us to differentiate between multiple myeloma involving the breast and breast carcinoma. In particular, mammography and ultrasound examination does not help the differential diagnosis. The mammographic pattern of multiple myeloma is generally characterized by round or lobulated well defined nodules mimicking a benign process without microcalcification. Recently Collins et al. [16] described one case of breast multiple myeloma using ultrasound and color Doppler examination. The presence of an echo-poor mass with posterior acoustic shadowing and the presence of neovascularization was similar to those found in presence of carcinoma. In our case the ultrasound images showed relatively echo-poor mass with rather distinct margins and posterior reinforcement. The mammographic pattern was that of nodules with well-defined margins without parenchymal distorsion. Plasma cells tumors may appear either in a solitary form or as disseminated multiple myeloma. Extramedullary plasmocytomas are rare and can represent either the initial manifestation of systemic MM.
or remain solitary for long time. Among the five patients with solitary breast plasmocytoma in two cases the localization was bilateral [7, 12], whereas in the other three it appeared to be a ‘true’ solitary plasmocytoma [10, 13, 14]. Only in one case was the breast involvement associated with a serum monoclonal gammapathy which disappeared after local treatment [14]. In all the three cases no recurrence has been shown after 40 months [14], 46 months [10] and 9 years [13] at the time of publication. The usual treatment of extramedullary plasmocytoma is radiotherapy with excellent long time results. The treatment of solitary plasmocytoma of the breast should consist of local excision followed by radiation therapy, whereas when breast involvement is secondary to disseminated MM the treatment should be that of the basic disease employing the most widely used polychemotherapy schedules like VAD (vincristine, adriamycin, dexamethazone) or MP (melphalan, 6-methylprednisolone).

References