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Case Report

Follicular dendritic cell sarcoma and invasive carcinoma of the breast

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ABSTRACT

Follicular dendritic cell sarcoma (FDCS) is an extremely rare neoplasm derived from antigen-presenting cells. It behaves as an intermediate grade sarcoma and has high risk of local recurrence and may metastasize. We report the case of a 39-year-old woman who presented with a left mammary mass, and underwent a left mastectomy and axillary lymph node dissection. Histopathological studies were consistent with the diagnosis of FDCS and high grade breast carcinoma, both tumors involving the breast and the axillary lymph nodes. Such association has not been previously described and therefore, FDCS might be considered in the differential diagnosis of breast tumors. We also review the previous cases reported in the literature involving the breast.

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1. Introduction

Dendritic cells are a heterogeneous group of nonlymphoid accessory cells present in the B- and T-cell areas of peripheral lymphoid tissue and are responsible for major histocompatibility complex restricted stimulation of resting T cells [1,2]. Neoplasms derived from follicular dendritic cells (FDCNs) are rare and usually occur within lymphoid tissue or extranodal sites [3–6]. Extranodal involvement of FDCNs can be the primary presentation of the tumors or may occur during the course of the disease. Breast involvement is very rare and, to date, no primary or secondary involvement of the breast by FDCNs, associated with invasive carcinoma has been described. At this site the diagnosis of FDCNs is challenging because they may mimic primary or metastatic neoplasms. We report the first case of FDC sarcoma (FDCS) associated with invasive carcinoma presenting in the breast. We review and discuss the clinicopathological features of FDCS in this location.

2. Clinical summary

A 39-year-old woman diagnosed of breast cancer was referred to our institution to complete treatment in June 2015. On physical examination, the patient had presented a left mammary tumor of 20 mm diameter located in the junction of the external quadrants. Breast ultrasonography study revealed a well-defined 20 mm lesion in the same site of left breast associated with enlarged left axillar lymph nodes. A tru-cut of the breast lesion was performed and left mastectomy with axillary lymphadenectomy was the final surgical treatment elected.

3. Pathological findings

On histological grounds, the features observed in both the breast core tru-cut biopsy and the surgical specimen were similar (Figs. 1 and 2). Two atypical components that growth relatively separated by a fibrous pseudocapsule were identified. The major part of the lesion was composed by a multinodular proliferation of medium-to-large pleomorphic-shaped cells with an irregular syncytial growth pattern and organized forming large nests. The neoplastic cells had large pale cytoplasm and round-to-ovoid vesicular nuclei with irregular nuclear membranes. Binucleated cells were frequent and the nucleoli were generally prominent. The mitotic rate was 1–2 mitoses per high-power field and abnormal mitotic figures were frequent. Myxoid areas and necrosis were absent. Small lymphocytes and plasma cells were commonly identified within the cytoplasm of individual atypical cells and surrounded the nests as well. Eosinophils were absent. An additional focus of large and atypical cells with eosinophilic cytoplasm and vesicular nuclei was observed. In this area the cells tended to grow more isolated or formed small groups of five to ten cells and were surrounded by desmoplastic stroma and an inflammatory component mainly composed by mature plasma cells. This area represented 5 to 10% of the total tumoral component.

The immunohistochemical studies allowed differentiating both components. Cytokeratins AE1/AE3, 5/6, 7, 19 and CAM 5.2 highlighted the cells of the minor component, which were negative for the

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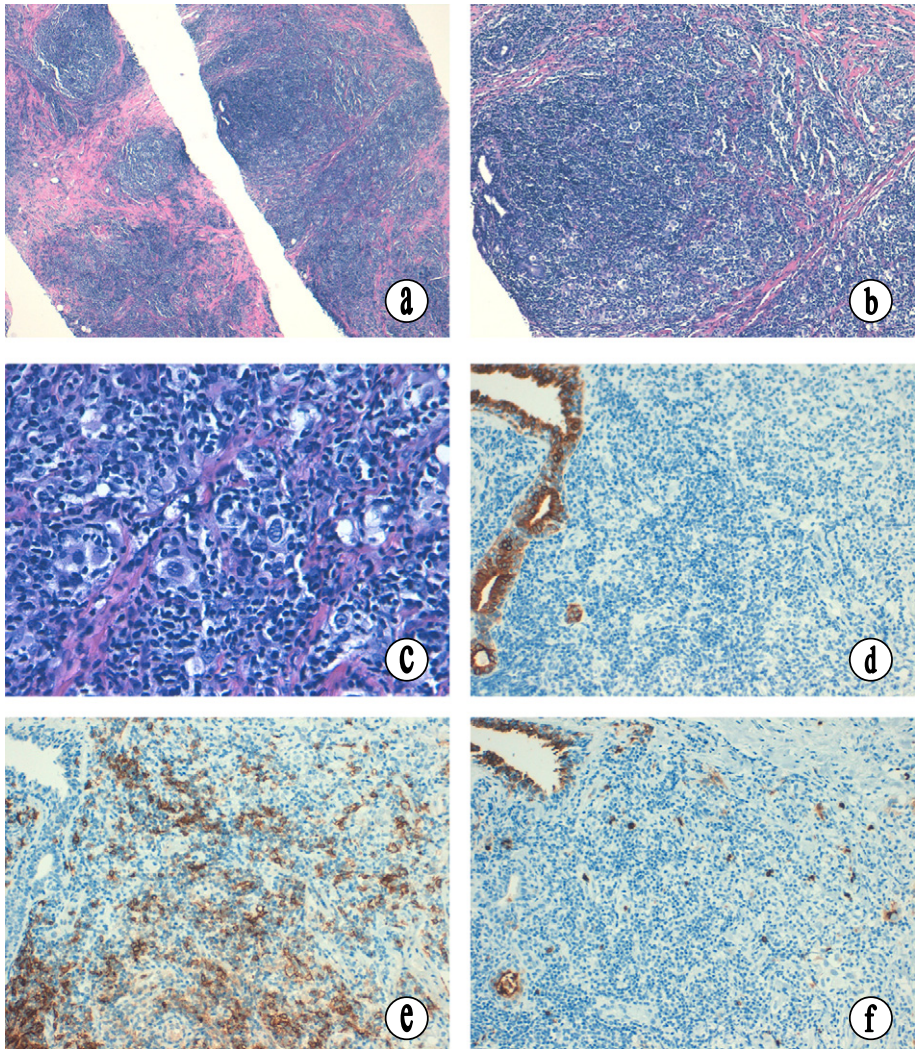

Fig. 1. Breast biopsy findings. a–c Histological features (a). The tumor had a multinodular appearance with fibrous septa (b,c). The nodules showed atypical polygonal or oval cells with ill-defined cell borders, eosinophylic cytoplasm, and oval or convoluted nuclei. They are admixed with small lymphocytes and plasma cells and a few bizarre, multinucleated giant cells. d–f Examples of immunohistochemical features (d,f). The neoplastic cells were not reactive to cytokeratin AE1/AE3 (e,f). The neoplastic cells showed isolated immunoreactive for CD20 and CD15.

hormonal receptors and HER2. The predominant component of the tumor did not express cytokeratins and the neoplastic cells had strong expression of vimentin, CD21 and CD15, and focal expression of EMA, CD23 and p63. Lymphoid markers such as CD45, PAX5, CD20, CD79a, CD3, CD5, CD7, CD4, CD8, CD30, ALK-1, CD68, smooth muscle actin, S-100 protein, melan-A or HMB45. The accompanying lymphocytes were predominantly CD4 in the major component, and were less frequent in the minor component, which was enriched in polytypic plasma cells. The axillary lymph node dissection obtained 34 lymph nodes and revealed metastasis of carcinoma in 2 lymph nodes and follicular dendritic cell sarcoma in 4 (Fig. 3). Notably, both tumors were admixed and involved one lymph nodes. In situ hybridization for the mRNA of the genes EBER-1 and 2 of the EBV was negative in our case, and no evidence of Castleman disease was identified in the breast or axillary lymph nodes. The final diagnosis was triple negative invasive carcinoma of no special type (pT1a) with axillary lymph node metastases pN1a (2 positive lymph nodes), associated with FDCS involving simultaneously the breast and the axillary lymph nodes. The presence of BRAF V600E mutation was examined by Sanger sequencing and was absent in both sarcoma and carcinoma components.

Further imaging studies and exploration of the head and neck area did not find evidence of additional disease. The patient received four cycles of chemotherapy with doxorubicin, cyclophosphamida, and paclitaxel. The patient will receive adjuvant radiotherapy and after six months of follow-up is free from disease.

4. Discussion

Dendritic cells are professional antigen presenting cells that participate in both innate and adaptive immune response [1,2]. They are a heterogeneous group of cells that includes Langerhans' cells, dermal dendrocytes, follicular dendritic cells, and interdigitating dendritic cells. Tumors arising from dendritic cells, such as FDCS and interdigitating dendritic cell sarcoma (IDCS) are very rare [3–7]. About 400 cases of FDCS have been reported in the English literature [3,6]. FDCS occurs at an average age of 50 but can range between 9 and 90 years old, and have no gender predominance. FDCS behaves like an intermediate grade sarcoma with a substantial risk of local recurrence (28.1%) and distant metastasis (27.2%) [3].

Tumors may occur at both nodal and extranodal locations as isolated disease in 31% and 58% of cases, respectively [3]. The oropharynx, parapharyngeal space, neck tissues, and tonsil are the most common extranodal sites involved, and in approximately 8–10% of cases can be simultaneously involved with cervical lymph nodes [3,6]. Additional extranodal sites have been described in the lungs, spleen, liver, gastrointestinal tract, pancreas and axial skeleton, associated or not with

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