International Journal of Scientific Reports
Veiga R et al. Int J Sci Rep. 2022 Sep;8(9):264-266
http://www.sci-rep.com
pISSN 2454-2156 | eISSN 2454-2164
DOI: https://dx.doi.org/10.18203/issn.2454-2156.IntJSciRep20222157

Case Report

Cutaneous myeloid sarcoma following neoadjuvant chemotherapy for breast carcinoma

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Received: 01 August 2022
Accepted: 16 August 2022

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ABSTRACT

Myeloid sarcoma (MS) is a neoplasm composed of myeloid blasts occurring outside the bone marrow, most often found simultaneously, or after a diagnosis of acute myeloid leukemia. Very rarely, de novo MS has been diagnosed in patients with a prior history of non-hematolymphoid neoplasms treated with systemic chemotherapy. We report a case of a MS in a 43-year-old woman, 6 months after the diagnosis of a HER2+ breast carcinoma, treated with neoadjuvant chemotherapy. Chemotherapy drugs could have played a pathogenic role in the development of MS in this patient. The exceeding rarity of such cases does make further and broader studies fundamental, in order to clarify if and which chemotherapy drugs may be the cause of MS.

Keywords: MS, Breast cancer, Systemic chemotherapy

INTRODUCTION

Myeloid sarcoma (MS) is a neoplasm composed of myeloid blasts, with or without maturation, occurring outside the bone marrow, most frequently found in lymph nodes and the skin.[1] It is most often found simultaneously, or after a diagnosis of acute myeloid leukemia (AML), but de novo cases (i.e., prior to the diagnosis of AML) have also been reported in the literature.[2] Very rarely, de novo MS has been diagnosed in patients with a prior history of non-hematolymphoid neoplasms treated with systemic chemotherapy (SCHT).[3] In this paper, we report an exceedingly unusual case of MS appearing on the breast skin of a female patient after treatment with systemic neoadjuvant chemotherapy for a previously diagnosed breast carcinoma.

CASE REPORT

A screening mammography in a 43-year-old woman identified a 15 mm spiculated lesion with associated satellite nodules and microcalcifications on the right breast. Dyslipidemia, smoking habits (20 packs/year), a congenital ureteral duplication, and a family history of breast carcinoma in a second-degree female relative were retrieved on clinical history. Biopsy findings revealed an HER2+ invasive carcinoma of the breast with a micropapillary pattern. After proper clinical and imaging workup, the patient was treated with a standard neoadjuvant SCHT regimen, followed by surgery. A total of 6 months has passed between the initial diagnosis and the breast surgery. Intraoperatively, besides the planned breast procedure, a subcutaneous, benign looking nodule on the contralateral breast was noted and concomitantly excised and sent to our department for diagnosis.

Gross and microscopic examination of the lumpectomy and sentinel node biopsy revealed a pathologic complete response [i.e., ypT0 ypN0 (sn)] of the previously diagnosed breast carcinoma. Histologic examination of the subcutaneous lesion showed a diffuse neoplasm occupying the whole dermis and extending deeply into the subcutaneous tissue (Figure 1A). Neoplastic cells had ovaloid, medium to large nuclei, clear chromatin, and small inconspicuous nucleoli, with clear eosinophilic cytoplasm (Figure 1B). Although not prominent, focal Indian filling could be also found. Frequent mitotic

figures were seen, as well as hemo-phagocytosis (Figure 1 C). Immunostains revealed CD45+, CD4+, CD43+ and Myeloperoxidase+ (Figure 2 A-D), as well as a very high Ki67 proliferative index (Figure 2 E). These findings were compatible with the diagnosis of MS. Sixteen months after the initial diagnosis, the patient is still free of disease.

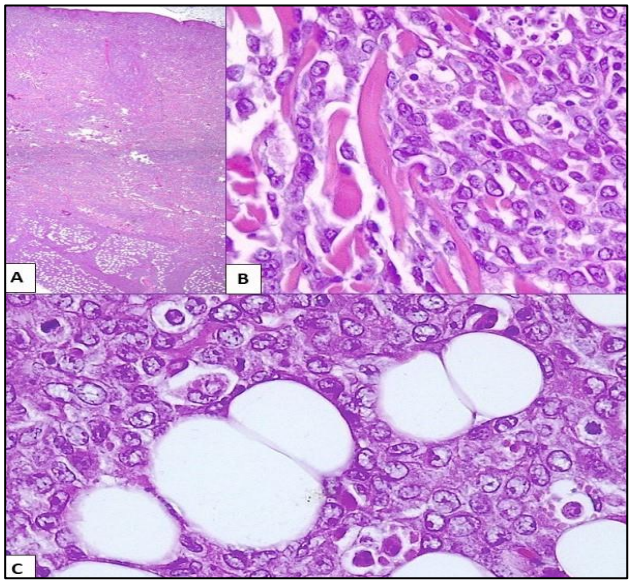

Figure 1 (A-C): Skin biopsy-subcutaneous diffuse neoplasm occupying whole dermis and extending deeply into subcutaneous tissue; neoplastic cells had ovaloid, medium to large nuclei, clear chromatin, and small inconspicuous nucleoli, with clear eosinophilic cytoplasm and focal Indian files; frequent mitotic figures and hemophagocytosis could also be seen.

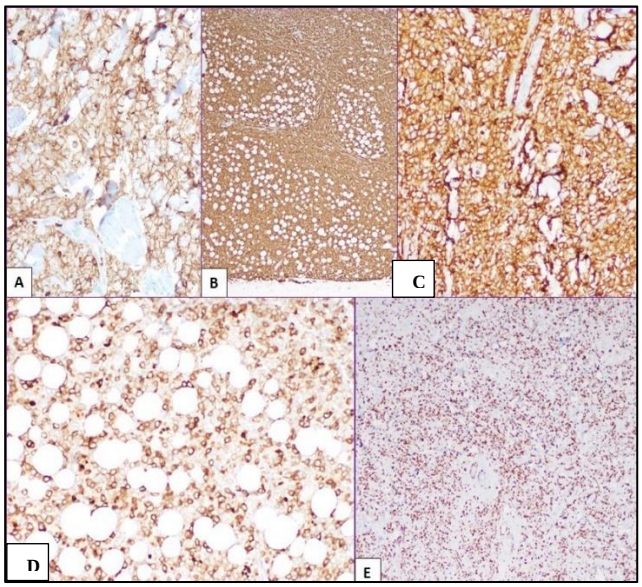

Figure 2 (A-E): Immunohistochemical studies: Positivity of the neoplastic cells for CD45, CD4, CD43 and myeloperoxidase, as well as a very high Ki67 proliferative index were revealed.

DISCUSSION

MS is a very rare disease, with a male predominance, most often found in the lymph nodes and skin.[1,2] The exact prevalence of MS in relation to different backgrounds of disease occurrence (de novo, concurrent with leukemia, as a recurrence) is still unknown.[1] Interestingly, cases of MS arising in patients with a previous history of SCHT following the diagnosis of a non-hematologic tumor are well documented by Pileri and colleagues.[3] They found that, in those patients, AML occurred simultaneous to MS, or a myelodysplastic syndrome (MDS) preceded it.[3] This contrasts with our case, since no other hematologic condition has yet been diagnosed. Other case series have not described a similar background of MS in the context of SCHT for a non-hematologic malignancy.[4,5]

We believe the timing of events is hardly coincidental, and that chemotherapy drugs could have played a pathogenic role in the development of MS in this patient. However, a coincidental occurrence cannot still be completely ruled out. The exceeding rarity of such cases does make further and broader studies fundamental, in order to clarify if and which chemotherapy drugs may be involved in the pathogenesis of MS.

After 16 months since the diagnosis of MS, the patient is still free of disease. Although it seems that patients with isolated MS may have a better prognosis than AML patients without MS, it is still too early to tell how our patient will clinically evolve.[2]

CONCLUSION

MS is a very rare disease, with only exceedingly rare cases happening on a background of SCHT for non-hematologic malignancies. To our knowledge, this is the first case reported in the English literature where MS did not occur simultaneously with AML, nor preceded by MDS, on a background of post-SCHT. Further and broader studies will be fundamental, to clarify the putative role of chemotherapy drugs in the pathogenesis of MS.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Veiga R, Vale E. Cutaneous myeloid sarcoma following neoadjuvant chemotherapy for breast carcinoma. Int J Sci Rep 2022;8(9):264-6.