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A rare case of Blastic plasmacytoid dendritic cell neoplasm with gynecologic presentation

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ABSTRACT

Blastic plasmacytoid dendritic cell neoplasm (BPDCN) is a rare hematological malignancy characterized by the proliferation of plasmacytoid dendritic cells with a blast-like appearance. It usually presents in elderly people, and clinical manifestations include nodular blue-violet skin lesions, bone marrow infiltration and, less frequently, extramedullary involvement. Gynecological manifestation (breast mass and exocervical lesion) is an unusual and rare presentation.

Herein, we report the case of a 51-year-old woman patient who presented with a history of a rapidly growing and bleeding breast mass, along with a decline in general health. Notably, the disease had multifocal involvement, affecting the breast, uterine cervix, and cervical lymphadenopathy.

Biopsies were performed on the breast mass and cervical lesion. Histopathological examination showed a diffuse lymphoid proliferation. The neoplastic cells show immunoreactivity for CD45 and CD56.

The myelogram showed a 50 % excess of blasts with a heterogeneous appearance with the presence of cells that could suggest dendritic plasmacytoid cells. Bone marrow immunophenotyping showed the presence of blast-like cells that were positive for CD4, CD56, CD123, which supported the diagnosis of BPDCN.

Despite initiating chemotherapy, the patient's condition rapidly deteriorated, highlighting the aggressive nature of BDCP. This case underscores the importance of early detection and the need for further research to improve outcomes for this rare condition.

1. Introduction

Blastic plasmacytoid dendritic cell neoplasm (BPDCN) is a very rare tumor classified in the category of Dendritic cell and histiocytic neoplasms [1]. The incidence is only 0.44 % of new hematologic malignancies per year [2]. It affects multitude of organs. the skin is the first affected site, followed by the bone-marrow and peripheral blood and lymph nodes [3]. For skin involvement, the lesions are usually described as erythematous to purplish papules, plaques or tumors with no preferred anatomic area [4]. However, to the best of our knowledge, gynecological locations, namely the breast and cervix, have never been reported as presentations of this rare type of neoplasm. The diagnosis is challenging, and require the use of a large panel of antibodies. BPDCN is characterized by an inherent resistance to standard chemotherapies. Treatment responses are mostly transient, the overall outcome being general very poor in general [4]. In this case, we present a young female patient with BPDCN with gynecologic presentation.

2. Case presentation

A 51-year-old woman, presented with a rapidly growing and bleeding mass in her right breast, accompanied by a decline in her general health over the previous two months. Her medical history included epilepsy managed with valproic acid, and a cholecystectomy in 2022. She is a G4P2A2 patient (Two vaginal delivery). Physical examination revealed a 4 cm bleeding mass in the right breast with two bilateral cervical lymphadenopathy measuring 2 to 3 cm. His blood count showed a normal white blood cell level associated with

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aregenerative normocytic normochromic anemia at 6.8 g/dl and a moderate thrombocytopenia at 103 G/l. The liver and kidney assessment, the tumor lysis assessment as well that the hemostasis assessment was without abnormalities, (Figs. 1., 2., 3., 4).

Biopsies were performed on the breast mass and exocervical lesion. Histopathological examination showed a diffuse lymphoid proliferation. Tumor cells are medium-sized, monomorphous and show frequent mitosis. The neoplastic cells show immunoreactivity for CD45 and CD56. the other surface markers could not be made due to lack of reagent.

The myelogram showed a 50 % excess of blasts with a heterogeneous appearance with the presence of cells that could suggest dendritic plasmacytoid cells. Bone marrow immunophenotyping showed the presence of blast-like cells that were positive for CD4, CD56, CD123, which supported the diagnosis of BPDCN. The bone marrow karyotype showed the presence on the majority of mitoses of abnormalities in number and structure affecting chromosomes 1, 2, 4, 6, 7, 9, 21 and 22.

Radiological investigations revealed a right-sided nodular goiter, lymphadenopathies in cervical and supraclavicular regions, a known breast mass, and enlarged mediastinal lymph nodes. Additionally, a left adrenal nodule and right adrenal hypertrophy, as well as homogeneous splenomegaly, were observed.

She was treated with one course of hyper-CVAD (cyclophosphamide, vincristine, doxorubicin, and dexamethasone) with one course of high-dose methotrexate. The treatment was complicated with febrile neutropenia and septic shock which was responsible for the patient's death.

3. Discussion

Blastic plasmacytoid dendritic cell neoplasm (BPDCN) is an extremely rare tumor, which usually affects but also the bone-marrow, peripheral blood and lymph nodes [3]. The 5th edition of the World Health Organization Classification of HaematolymphoidTumors classified Blastic plasmacytoid dendritic cell neoplasm in the category of Dendritic cell and histiocytic neoplasms. These neoplasms are positioned in the classification after myeloid neoplasms in recognition of their derivation from common myeloid progenitors that give rise to cells of the monocytic/ histiocytic/dendritic lineages [1].

Skin is the most commun and first affected organ [4]. However the absence of skin lesions does not preclude the diagnosis [4]. Cutaneous lesions are variable. It could be unique or spread lesions. Skin lesions range from brown to violaceous bruise like lesions, papules, plaques or tumours [4].

Mucous lesions was been described in one case of gingival lesion [5]. Another case of gastric polypoid lesions was been reported [6].

Gynecological manifestation (breast mass and exocervical lesion) is an unusual and rare presentation. to the best of our knowledge, this is the first case of BDCP with gynecologic presentation.

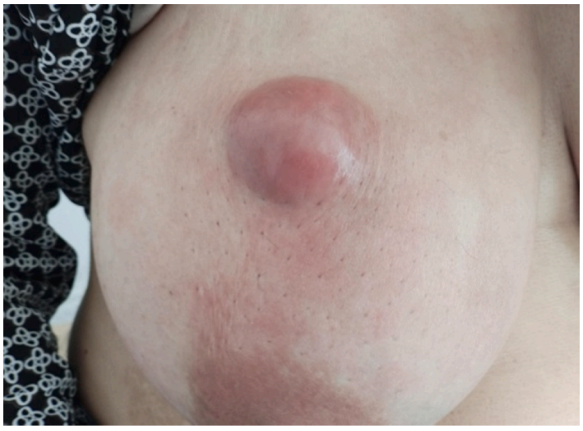

Fig. 1. Breast mass at the first consultation.

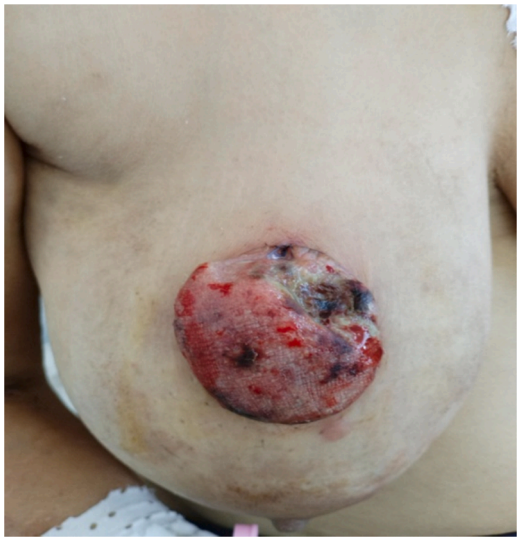

Fig. 2. Breast mass after biopsy.

The case we present here is truly exceptional as it diverges from the typical BDCP presentation, showcasing multifocal manifestations that extend to both the breast and the uterine cervix.

The diagnosis is challenging, and require the use of a large panel of antibodies. According to the 5th edition of the World Health Organization Classification of Haematolymphoidtumours, immunophenotypic diagnostic criteria was : expression of CD123 and one other marker (TCF4, TCL1, CD303, CD304) in addition to CD4 and/or CD56 or expression of any three of these markers (CD123, TCF4, TCL1, CD303, CD304) and absent expression of all expected negative markers (CD3, CD14, CD19, CD34, Lysozyme Myeloperoxidase).[1]The rarity of this hemopathy explains the fact that there were no clear recommendatios regarding therapeutic management. The protocol hyper-CVAD (hyper-fractionated cyclophosphamide, vincristine, doxorubicin, dexamethasone alternatingwith methotrexate and cytarabine), was used as frontline therapy for BPDCN with encouraging responses (CR rate of 90 % in 10 patients). However, responses were relatively short-lived at a median of 20 months, and median overall survival (OS) was 29 months [7].Other chemotherapy regimen was used such as AML (acute myeloïd leukemia) like induction regimen (daunorubicin plus cytarabine followed by high-dose cytarabine) or ALL (acute lymphoblastic leukemia) like induction regimen (dexamethasone, methotrexate, vincristine, cyclophosphamide/ifosfamide, and idarubicin/daunorubicin) [8]. The CR rate was over 80 % but unfortunately, the median time-to-disease relapse was only 7 months [8].

The management of BPDCN has been clear progress since the advent of targeted therapies. In December 2018, Tagraxofusp-erzs (anti CD123) received FDA approval for the treatment of BPDCN in adults and children 2 years of age and older [9]. he originality of this case report comes from the fact that the location is unusual (breast and cervix) and has never been described in the literature. in addition the presentation of the tumor in the form of a mass is also unusual. This case prompts us to consider the diagnosis of BPDCN in the event of cutaneous involvement even if the location and presentation is unusual, and this especially in the presence of lymph node and osteomedullary dissemination.

4. Conclusion

This case exemplifies the diagnostic intricacies and unusual clinical presentations of BPDCN. Advancements in our understanding of this rare condition are imperative to expedite accurate diagnosis and to uncover more effective treatment strategies for the benefit of future

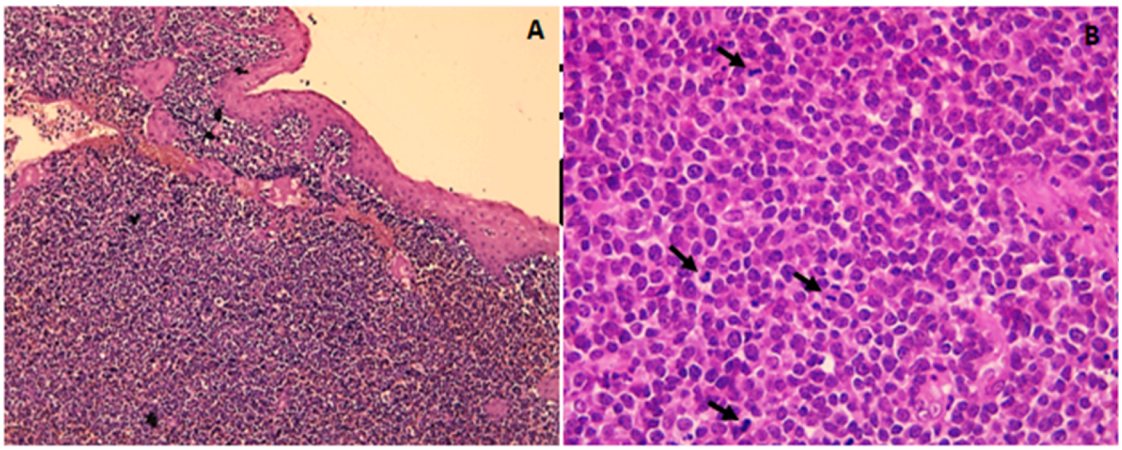

Fig. 3. Blastic plasmacytoid dendritic cell neoplasm:
A: The lamina propria of the cervix mucosa is involved by a diffuse lymphoid proliferation (Hematoxylin Eosin x 100).
B: Tumor cells are medium-sized, monomorphous and show frequent mitosis (arrows) (Hematoxylin Eosin x400.

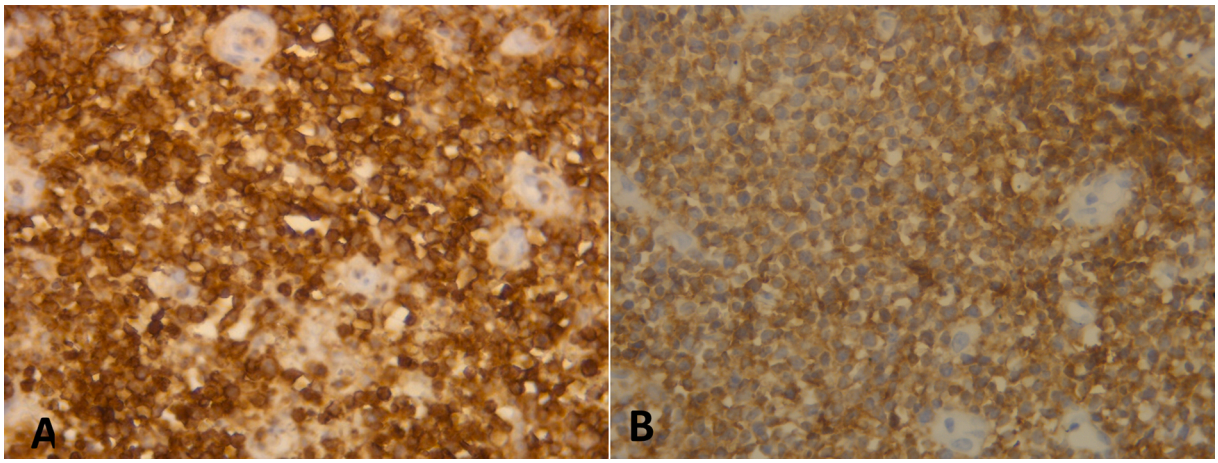

Fig. 4. The neoplastic cells show immunoreactivity for CD45 (A x 400) and CD56(B x CD56).

patients. The ongoing challenge remains to establish concrete diagnostic criteria and therapeutic protocols for this elusive and relentless disease.

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Ethical approval

Not applicable. Our institution requires no ethical approval for case reports.

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All authors read and approved the final manuscript.

CRediT authorship contribution statement

Marzouk Khouloud: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources. **Slama Nader:** Conceptualization, Data curation. **Bellalah Ahlem:** Conceptualization, Data curation, Visualization. **Safra Ines:** Conceptualization, Data curation, Formal analysis. **Hafsi Montacer:** . **Chabbeh Rayhan:** Data curation, Formal analysis, Funding acquisition, Investigation.

Declaration of competing interest

The authors declare that they have no conflicts of interest related to this research project.

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None.

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