



Case Report

Primary diffuse B-cell non-Hodgkin's breast lymphoma; A case report with a brief literature review

Zuhair D. Hammood^a, Abdulwahid M. Salih^{a,b}, Shaban Latif^a, Hiwa O. Abdullah^{a,c}, Razhan K. Ali^d, Fahmi H. Kakamad^{a,b,c,*}

^a Smart Health Tower, Madam Mitterrand Street, Sulaimani, Kurdistan, Iraq

^b College of Medicine, University of Sulaimani, Madam Mitterrand Street, Sulaimani, Kurdistan, Iraq

^c Kscien Organization, Hamdi Str, Azadi Mall, Sulaimani, Kurdistan, Iraq

^d Department of Cardiothoracic Surgery, Shar Hospital, Sulaimani, Iraq

ARTICLE INFO

Keywords:

B-cell
Lymph nodes
Breast cancer

ABSTRACT

Introduction: Primary non-Hodgkin's breast lymphoma is a very rare entity. The present study aims to report a case of primary diffuse B-cell non-Hodgkin's breast lymphoma.

Case presentation: A 55-year-old female presented with a right breast mass for a duration of 4 months. There was no history of cancer in her family. She has had umbilical hernial repair two years before this presentation. Examination revealed the presence of a suspicious mass in the right breast and multiple axillary lymph nodes. Ultrasound showed a rounded vascular mass (46*40mm) and pathological axillary lymph nodes, U5. Mammography showed a round, dense mass with an indistinct posterior margin and a few round axillary lymph nodes, M4. A Core needle biopsy was done which showed an invasive mammary carcinoma; the result of the FNA of the axillary lymph nodes was benign lymphoid tissue. Histopathological examination confirmed the presence of a tumor, sized 6.4cm, non-Hodgkin's lymphoma. Modified radical mastectomy was performed. The histopathological examination confirmed non-Hodgkin's lymphoma.

Clinical discussion: There are two main groups of primary breast lymphoma. The bilateral diffuse-type affects the younger puerperal women associated with pregnancy or recent childbirth that may involve the CNS, ovaries, and gastrointestinal tract without lymph node involvement. The second type, the unilateral type, which appears in elderly women without extra mammary involvement.

Conclusion: Primary breast non-Hodgkin's lymphoma is a rare disease. It mimics breast cancer, and hence, may lead to misdiagnosis. The common modalities of treatment include chemotherapy, radiotherapy, and surgery.

1. Introduction

Primary non-Hodgkin's breast lymphoma (PNHBL) is a rare and sparse entity that was first reported by Bobrotina et al., in 1959 [1,2]. It only comprises 0.1%–0.5% of all malignant breast cancers and approximately 1.7%–2.2% of extranodal non-Hodgkin's lymphomas [3,4]. It usually represents a heterogeneous group of malignancies that originates from the lymphoid system as a palpable mass [5]. Because of mimicking a benign tumor and its similarity to breast carcinoma, PNBHL is rarely noticed by clinical and radiological screening [2,4]. It seems that PNBHL like other types of cancer arises through the aggregation of multiple genetic aberrations that enhance the growth of malignant cells. The initial step in the malignant transformation could be the recurrent

translocations that occur during different steps of the B-cell differentiation process. As an outcome, cell proliferation control, survival, and differentiation may be defected due to the oncogenes' deregulated expression. However, to develop lymphoma, these translocations alone are not sufficient to induce malignancy. Secondary genetic modifications are necessary for the complete malignant transformation [5].

There is a higher incidence in the developed countries in comparison to the developing countries. According to the literature, both genders are susceptible for being affected with the average age of the sixth decade of life [6,7].

The mortality rates of non-Hodgkin's lymphoma in the 1990s were higher compared to that of today. The survival rates for 5 years were about 50% from 1975 to 1995; the ratio had increased to 65% from 1996

* Corresponding author. Doctor City, Building 11, Apartment 50, Sulaimani, Iraq.

E-mail address: fahmi.hussein@univsul.edu.iq (F.H. Kakamad).

<https://doi.org/10.1016/j.amsu.2022.103310>

Received 9 December 2021; Received in revised form 14 January 2022; Accepted 23 January 2022

Available online 26 January 2022

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to 2007. In addition, survival in Caucasian populations is higher than that of African American populations - with more recovery in females than in males [6].

This study aims to present a case of primary diffuse B-cell-non-Hodgkin's breast lymphoma without ipsilateral axillary lymph node involvement with a brief literature review. This has been written in line with SCARE guidelines [7].

2. Case history

2.1. Patient information

A 55-year-old female presented with a right breast mass of 4-month duration. She was a mother of 8 children and breastfed for 16 years. She had a history of hepatitis B infection for which she was treated accordingly. She had no other chronic conditions. She had an umbilical hernia repaired two years prior. Past medical, past surgical, drug and family histories were negative.

2.2. Clinical findings

Examination revealed the presence of a well-defined mass in the right breast and multiple axillary lymph nodes.

2.3. Diagnostic assessment

Ultrasound showed a rounded vascular mass (46*40mm) and pathological axillary lymph nodes, U5. Mammography showed a round, dense mass with an indistinct posterior margin and a few round axillary lymph nodes, M4. A Core needle biopsy was done which showed an invasive mammary carcinoma; the result of the FNA of the axillary lymph nodes was benign lymphoid tissue. Histopathological examination showed the presence of a tumor, sized 6.4cm, non-Hodgkin's lymphoma, suggestive of diffuse B-cell lymphoma (primary breast lymphoma).

2.4. Therapeutic intervention

Modified radical mastectomy was performed. The histopathological examination confirmed non-Hodgkin's lymphoma, suggestive of diffuse B-cell lymphoma (primary breast lymphoma). The tumor size was 6.4cm. Twenty one axillary lymph nodes were isolated and shown to be reactive. The patient did not give consent for SLNB.

2.5. Follow-up

The patient was referred to a hematological center for further management.

3. Discussion

While lymphomas are considered to be the most frequent hematologic cancers, association with breast is a rare entity, especially primary breast lymphoma (PBL). It roughly comprises 0.1%–0.5% of all malignant breast cancers and about 1.7%–2.2% of extranodal lymphomas [4]. Following the improvement of diagnostic modalities, the incidence of PBL is increasing, and most of the cases have been diagnosed in women in their fifth or sixth decades of life. It is very rare in men [8]. Contrary to the previous studies, Zhang et al., claimed that men are more susceptible to being affected [6]. The current case is a 55-year-old female presented with a right breast mass without family history of cancer.

Primary breast lymphoma is pathologically described as the occurrence of lymphomatous invasion into the normal breast tissue in patients without prior or concurrent non-Hodgkin's lymphoma at any other sites; ipsilateral axillary lymph nodes may be involved [9].

There are two main groups of primary breast lymphoma. The

bilateral diffuse-type affects the younger puerperal women associated with pregnancy or recent childbirth that may involve the CNS, ovaries, and gastrointestinal tract without lymph node involvement. The second type, the unilateral type, which appears in elderly women without extra mammary involvement [10,11].

The clinical criteria for the classification of PBL have been described by Wiseman and Liao. The principles include:

1. In the presentation, the clinical site is usually the breast.
2. There is no previous history of lymphoma and no evidence of disease distribution.
3. In the pathological examination, lymphoma has an association with breast tissue.
4. If there is any simultaneous development with the primary breast tumor, ipsilateral lymph nodes may be involved [10]. The first three criteria were found in the current case.

Ultrasound usually demonstrates the PBNHL as a hypoechoic region with micro lobulated margins revealing increased vascularity [12]. Single, noncalcified, and well defined mass with lymphadenopathy appears in typical mammography. Infrequently, increasing parenchymal density with skin thickening may be noticed [9]. For detecting multicentric lesions, MRI is regarded to be more sensitive and valid than other diagnoses.

Due to clinical and radiological similarities between lymphomas and carcinomas of the breast, the specialist should be aware of properly distinguishing between them due to the difference in the proper line of management. To differentiate these two malignancies, pathological examination remains the gold standard. Histopathology, IHC, and flow cytometry are capable to discriminate PBL from other tumors [13].

The histologic grade affects the management of primary breast non-Hodgkin's lymphoma. Local therapy is recommended alone for the management of patients with a low-grade disease without any authorized evidence for the necessity of chemotherapy. On the other hand, patients with an intermediate or high-grade disease are better managed by chemotherapy [3].

Mastectomy has been regarded as a common treatment modality in the management of PBL for the last decades although several studies have shown that mastectomy is unsuccessful in the treatment of primary breast lymphoma [12,14,15]. Preferably, radiotherapy and chemotherapy should be used until correct histological diagnoses using biopsy establishes the necessity of surgery [3]. In the current case, the histopathological result showed primary non-Hodgkin's breast lymphoma. After the refusal of chemotherapy and radiotherapy by the patient, a multidisciplinary team decided to choose mastectomy as the alternative option.

4. Conclusion

Primary breast non-Hodgkin's lymphoma is a rare disease that mostly affects females. It mimics breast cancer and, hence, can cause an error in the proper management. The common treatment modalities include chemotherapy, radiotherapy, and mastectomy.

Sources of funding

No source to be stated.

Author contribution

Abdulwahid M. Salh: major contribution of the idea, literature review, final approval of the manuscript. Zuhair D. Hammood: Surgeon performing the operation, final approval of the manuscript. Fahmi H. Kakamad, Karzan M. Salih: literature review, writing the manuscript, final approval of the manuscript. Shaban Latif, Hiwa O. Abdullah, Razhan K. Ali: literature review, final approval of the manuscript.

Consent

Consent has been taken from the patients and the family of the patients.

Registration of research studies

1. Chinese Clinical Trial Registry.
2. ChiCTR2100047387.
3. Chinese Clinical Trial Register (ChiCTR) - The world health organization international clinical trials registered organization registered platform.

Guarantor

Fahmi Hussein Kakamad is Guarantor of this submission.

Provenance and peer review

Not commissioned, externally peer reviewed.

Declaration of competing interest

There is no conflict to be declared.

References

- [1] A.F. Bobrotina, Z.B. Zlotnikova, Generalized sarcomatosis (lymphosarcomatosis) in pregnancy with unusual bilateral involvement of the breasts, *Vopr. Onkol.* 5 (5) (1959) 613–616.
- [2] V.E. Duncan, V.V. Reddy, N.C. Jhala, D.C. Chheng, D.N. Jhala, Non-Hodgkin's lymphoma of the breast: a review of 18 primary and secondary cases, *Ann. Diagn. Pathol.* 10 (3) (2006) 144–148.
- [3] V. Gupta, N. Bhutani, S. Singh, S. Chhabra, R. Sen, Primary non-Hodgkin's lymphoma of breast—A rare cause of breast lump, *Hum. Pathol. Case Rep.* 7 (2017) 47–50.
- [4] O.A. Harb, S.A. Balata, H. Ashour, E. Eltokhy, L.M. Gertallah, R.Z. Ahmed, A. M. Hassanin, Primary diffuse large B-cell non-Hodgkin's lymphoma of the breast—a case report and review of the literature, *Radiol. Case Rep.* 14 (1) (2019) 22–27.
- [5] H. Nogai, B. Dörken, G. Lenz, Pathogenesis of non-Hodgkin's lymphoma, *J. Clin. Oncol.* 29 (14) (2011) 1803–1811.
- [6] Y. Zhang, Y. Dai, T. Zheng, S. Ma, Risk factors of non-Hodgkin's lymphoma, *Expert Opin. Med. Diagn.* 5 (6) (2011) 539–550.
- [7] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, for the SCARE Group, The SCARE 2020 guideline: updating consensus surgical CAse REport (SCARE) guidelines, *Int. J. Surg.* 84 (2020) 226–230.
- [8] H. Yang, R.-G. Lang, L. Fu, Primary breast lymphoma (PBL): a literature review, *Clin. Oncol. Cancer Res.* 8 (2011) 128–132.
- [9] L. Liberman, C.S. Giess, D.D. Dershaw, D.C. Louie, B.M. Deutch, Non-Hodgkin lymphoma of the breast: imaging characteristics and correlation with histopathologic findings, *Radiology* 192 (1) (1994) 157–160.
- [10] L.G. Bobrow, M.A. Richards, L.C. Happerfield, T.C. Diss, P.G. Isaacson, G. A. Lammie, et al., Breast lymphomas: a clinicopathologic review, *Hum. Pathol.* 24 (3) (1993) 274–278.
- [11] C. Wiseman, K.T. Liao, Primary lymphoma of the breast, *Cancer* 29 (6) (1972) 1705–1712.
- [12] C.Y. Lyou, S.K. Yang, D.H. Choe, B.H. Lee, K.H. Kim, Mammographic and sonographic findings of primary breast lymphoma, *Clin. Imag.* 31 (4) (2007) 234–238.
- [13] S. Kumar, S.K. Tiwary, R. Khanna, A. Khanna, Primary Non-Hodgkin's lymphoma of the breast, *Internet, J. Surg.* 9 (2) (2007).
- [14] K. Ganjoo, R. Advani, M.R. Mariappan, A. McMillan, S. Horning, Non-Hodgkin lymphoma of the breast, *Cancer* 110 (1) (2007) 25–30.
- [15] M.H. Lbrahim, S. Singletary, Surgical management of primary lymphoma of the breast, *Ann. Surg.* 214 (6) (1991) 724–726.