Case report

# Intermammary breast cancer; the first reported case

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**A B S T R A C T**

*Introduction:* Cancer of the breast is the most common cancer among females. The current study aims to report and discuss a rare case of breast cancer in the intermammary region.
*Case report:* A 61-year-old lady presented with intermammary swelling for three months. Ultrasound examination showed a hypoechoic micro lobulated mass with internal vascularity seated on the chest wall. There was pathological lymphnodes in the right axilla. Core needle biopsy suspected invasive ductal carcinoma of no specific type. The patient was referred to an oncology center receiving 21 cycles of radiotherapy and hormonal therapy.
*Discussion:* The most common site of the occurrence of breast cancer is the upper outer quadrant (found in one-third of patients), followed by the upper inner quadrant (9.4%)—both lower outer and inner quadrants (5.2%) and rarely in the central portion. Intermammary breast cancer is an infrequent finding.
*Conclusion:* Although it is extremely rare, breast cancer could occur in the intermammary region. It has the same management strategy as breast cancer.

## 1. Introduction

Breast cancer is the most common cancer in females and one of the most common causes of death in this gender [1]. It is still a significant problem of public health with an increasing incidence in most of the world's regions [2]. It compromises approximately 18% of all cancers of females, and predicted by 2021, the incidence will be raised to 85 per 100,000 women [3]. Among all breast cancers, triple-negative breast cancer (TNBC) which characterized by the loss of expression of estrogen receptors, progesterone receptor, and human epidermal growth factor receptor 2, is more liable for distant metastasis compared to other types of breast cancers [4].

The current study aims to report an extremely rare case of breast cancer in an unusual location (intermammary) with axillary lymph node metastasis. The report has been arranged in line with SCARE 2020 guidelines with a brief literature review [5].

## 2. Case report

### 2.1. Patient's information

A 61-year-old post-menopausal lady presented with intermammary swelling for three months. She was gravida two and para 2. Her past surgical history was significant for lumbosacral spine surgery for degenerative disc disease.

### 2.2. Clinical findings

There was a palpable well-defined hard, non-tender mass with smooth surface in the intermammary area slightly to the right, correspondent to the level of 5-8 intercostal space.

### 2.3. Diagnostic assessment

On a mammogram, both breasts showed scattered fibroglandular tissue, no mass was seen on standard CC and MLO views. Ultrasound examination showed a hypoechoic micro lobulated mass with internal

vascularity seated on the chest wall measuring about 37*27 mm associated with right intercostal solitary node at (3rd and 4th intercostal node) highly suspicious of malignancy (Fig. 1).

In the right axilla, two pathological lymph nodes were seen in level I with thick cortex measuring (22*8 mm). Core needle biopsy of the lesion suspected invasive ductal carcinoma of no specific subtype, poorly differentiated grade III carcinoma. Fine needle aspiration cytology (FNAC) of the right axillary lymph node was positive for malignancy (metastatic invasive ductal carcinoma), while FNAC of the Left axillary lymph node was negative for malignancy (benign lymphoid cells).

Computed tomography (CT) scan revealed a 38*26 mm mass in the intermammary region associated with a single small lymph node at the internal mammary level just 2 cm above the mass, a 12 mm pathological lymph node also seen in the right axilla. There was also a 19 mm irregular mass in the right para cardial region in contract with the right atrial appendage with strong enhancement. It was suspicious for lymph node metastasis. There was bilateral adrenal lesions (left 13 mm, right 16 mm, both with density less than 10 HU. picture of bilateral adrenal adenoma).

PET/CT scan demonstrated a hypermetabolic soft tissue mass (36*22 mm, SUV max 9.5_primary tumor) in the intermammary region. Hypermetabolic lymph nodes are seen in the right axilla (11*10 mm and SUV max 4.5) and right anterior para cardiac (20*12 mm and SUV max 7.1) along the atrium. Left breast and axilla were unremarkable.

Thoracoscopic mediastinal lymph node biopsy confirmed metastasis. Immunohistochemistry for estrogen receptor was positive with Allred score 8. Progesterone receptors were positive with Allred score 7. HER2/neu was negative, Ki67 was 42%.

### 2.4. Therapeutic intervention

The patient referred to an oncology center, she received 21 cycles of radiotherapy with hormonal therapy (letrozole tab once daily for five years) in combination with Kinase inhibitor (Palbociclib capsule once daily).

### 2.5. Follow-up

The patient is doing well and alive five years after the diagnosis.

### 3. Discussion

Breast cancer is regarded as a clinically and genomically heterogenous disease [6]. The risk of developing breast cancer is 1 in 8 women, and more than 40% of the affected individual are over 65 years old which accounts for nearly 60% of total deaths from this disease [7]. In 2013, approximately 79% of newly diagnosed patients and 88% of mortality due to the breast cancer are reported in patients over 50 years old or more [8]. It is suggested that breast cancer is a collection of different diseases with various risk factors, clinical manifestations, pathological features, response to medical therapy, and prognosis [9]. The most common site of the occurrence is the upper outer quadrant in one-third of patients, followed by the upper inner quadrant (9.4%), lower outer quadrant, lower inner quadrant (5.2%), and rarely in the central portion [10]. In the current patient, the site was the intermammary region which has never been reported in the English literature.

Numerous factors increase the possibility of developing breast cancer. The most substantial proven risk factor is age [11]. The breast is an estrogen-sensitive organ. The contraceptive pill may lead to an enlarged and tender breast increasing the risk of breast cancer [3]. Damage to the deoxyribonucleic acid (DNA) and genetic alteration in the genes such as P53, BRCA 1, and type 2 also guide cancer development [3]. Family history is another crucial factor that can also cause considerable anxiety in women [12]. There is also an increased risk in patients with high body mass index (BMI), particularly in postmenopausal women, and associated with poorer prognosis in all age groups [13]. Age at menarche, age when gives the first live birth, previous benign breast masses and having a first-degree relative with the disease are others predicting risk factors
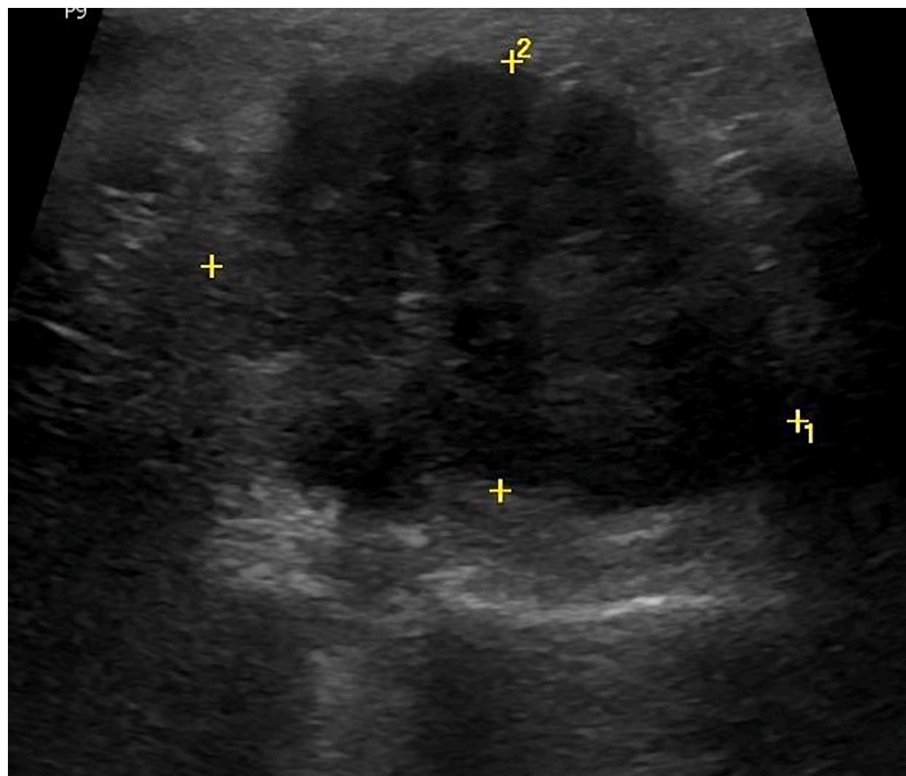


**Fig. 1.** Ultrasound examination showing an irregular heterogeneously hypoechoic micro lobulated solid mass was seen with combined posterior features and minimal internal vascularity seen measuring (37 × 27 mm).

[14]. It is one of the most commonly diagnosed malignancies in women during menopause, sometimes leading to a significant impairment in the patient's daily activity [15].

Approximately one-third of the cases present with a palpable breast mass. The main lymphatic drainage of the breast is ipsilateral axilla, internal mammary chain is the main extra-axillary drainage, and to a lesser extent drains into the intramammary, sub-clavicular, interpectoral, and supraclavicular lymph nodes. Other clinical presentations are pain, nipple retraction, skin thickness, skin redness, nipple discharge, and ulcer. Sometimes these presentations will delay, and some patients may present with advanced metastatic disease [16]. Some rare presentations have been reported in the literature due to metastasis, such as pancytopenia due to metastasis to the bone marrow. Other rare reported presentations are acute abdomen and Bell's palsy [17].

Cancer of the breast can be diagnosed through the monitoring of the patients with different imaging techniques. Mammography is the standard screening technique. It has a considerable effect on the reduction of mortality-related diseases [18]. However, previous studies demonstrated that mammography is less valuable for patients under the age of 40 years. Its sensitivity is inversely proportional to the density of the breast and it is less effective for tumors of less than 1 mm [19]. The overall mean size of clinically detectable cancer is 2.6 cm, which is significantly larger compared to those found on screening mammography 1.5 cm [20]. The effectiveness of ultrasound was shown to be similar to mammography. There is a significant increase in the effectiveness of screening of breast cancer by using ultrasound in addition to the mammography technique, and the majority of cancers detected by ultrasound are more likely to be invasive and node-negative. However, Lehman et al. reported that the use of ultrasound has a higher sensitivity (95%) than mammography (61%) [21]. Also, Houssami et al. demonstrated a higher sensitivity of ultrasound among women aged below 45 years. Another important diagnostic tool is magnetic resonance imaging (MRI), which can be used for various aspects of the cancer's treatment such as monitoring the response to the treatment, high-risk patients, and assessment of metastasis [22]. Screening with MRI is thought to be more effective than ultrasound particularly in high-risk patients.

The main aspects of breast cancer therapy are early detection and monitoring of the patients. In non-metastatic breast cancer, the goal of treatment is to curing and eradicating the tumor from the breast and the surrounding lymph nodes and preventing the recurrence of the disease [23]. Different strategies of therapy are available such as targeted therapy, hormonal therapy, surgery, chemotherapy and radiation therapy. The aim of management in those with distant metastasis is to improve quality of life and survival rate. The main prognostic factor in breast cancer is nodal metastasis. Clinically diagnosed cancers are more prone to have axillary lymph node metastases with an incidence of 38% to 45% compared with those diagnosed by screening (18% to 25%) [24]. The 5-year survival for tumors of less than 1 cm is reported to be 99%, and for those tumors with 3 to 5 cm is 86% [25].

In conclusion, breast cancer is common cancer in women. The most common site of occurrence is the upper outer quadrant. However, the intermammary region could be another site for the development of breast cancer.

## Patient consent

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

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None is found.

## CRediT authorship contribution statement

Abdulwahid M. Salih, Zhair D. Hammood: Doctors managing the case, follow up the patient, and final approval of the manuscript.

Fahmi H. Kakamad, Rawezh Q. Salih, Bakhan S. Ali, Hemn A. Hassan: literature review, writing the manuscript, final approval of the manuscript.

Lana R. A. Pshtiwan: major contribution to the idea, revision and final revision of the manuscript.

## Declaration of competing interest

There is no conflict to be declared.

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