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A Rare Case of Synchronous us Carcinoma Breast with Chronic Myeloid Leukemia

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Chronic myeloid leukemia is an insidiously progressive condition and comparatively rare type of blood cell malignancy that begins in the bone marrow. Chronic myeloid leukemia typically affects adult population and is documented to be caused by chromosomal mutation that usually occurs spontaneously.

Chronic myeloid leukemia is more common in males than in females (male: female ratio of 1.4:1) and appears more commonly in the elderly with a median age at diagnosis of 65 years [1] Exposure to ionising radiation is one of the risk factors, based on a 50 fold higher incidence of CML in Hiroshima and Nagasaki nuclear bombing survivors [1] The rate of CML in these individuals seems to reach at its peak about 10 years after the exposure [1].

Carcinoma breast on the other hand is one of the most common causes of death in middle aged women in western countries. There are numerous factors contributing as its etiological factors such as age, gender, diet, endocrinal factors, previous radiation exposure, genetic factors and geographical factors.

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We present a case report of a 44 old female who came to Acharya Vinoba Bhave Rural Hospital (Datta Meghe Institute of Medical Sciences and Research), with presenting complaint of lump in the left breast since 2 days and abdominal mass for 1 month. On investigations, patient was diagnosed with a rare case of chronic myeloid leukemia on the complete blood count and peripheral smear and the lump in the left breast also revealed invasive ductal carcinoma of the left breast.

Keywords: Chronic myeloid leukemia; carcinoma breast; peripheral smear.

1. INTRODUCTION

Synchronous presentation of carcinoma breast with chronic myeloid leukemia in the chronic phase as an incidental finding:

A few case reports state that chronic myeloid leukemia, acute lymphocytic leukemia, chronic myelomonocytic leukemia are documented to be preceded by anthracycline-based pharmacotherapy for breast cancers or concurrently associated with adenocarcinoma stomach [2] A malignancy predisposes a patient to an increased risk of developing associated malignancies or morbidities. In chronic myeloid leukemia, synchronous malignancies of prostate, stomach, ovary, cervix have been reported with rare incidence of lymphomas, small cell lung cancers, basal cell carcinoma, etc [3] Moertal, et al reported 17 cases of chronic myeloid leukemia occurring in association with synchronous malignancies. In a study with age and sex-matched controls, patients who were with median age of 40-60 years had approximately 10 times more risk of concurrent malignancies than age-matched controls. No synchronous malignancy was reported in patients younger than 40 years [4,5]. In chronic myeloid leukemia, mutation in 'Ph chromosome' was elaborated. It occurs around 6 years before the presentation of the disease, contrary to carcinoma breast that occurs many years prior to its presentation [6]

Evidently, a case of synchronous presentation of carcinoma breast with chronic myeloid leukemia is a very rare presentation which has a scarcity of the literature about the association.

2. CASE REPORT

A 44 year old female presented in the out-patient department with history of lump in the left breast which was insidious in onset, gradually progressive in nature and there were no aggravating or relieving factors associated with it. The patient also complains of lump in the abdomen which was insidious in onset and gradually progressive in nature. On clinical examination there was splenomegaly of grade III as well as hepatomegaly of 8cms. On clinical examination the breasts were bilaterally asymmetrical with fullness in the upper outer quadrant of the left breast. There was retraction of nipple but no peau d'orange (orange peel-like) appearance observed. The lump was hard of size 4×5 cm in the upper outer quadrant of the left breast. Tenderness was present. The swelling was fixed to the chest wall.

3. MANAGEMENT

Peripheral smear was done and findings consistent with chronic myeloid leukemia in chronic phase were reported.

Ultrasonography of breasts was reported as:

Right breast: No focal lesion noted, right axilla: reactive lymphadenopathy noted (LN1 - 8.5×4.2 mm, LN2 - 9.1×4.6 mm).

Left breast: Retroareolar irregular hypoechoic mass of approximate size 26×24 mm, showing increased vascularity on Doppler study.

The patient was counselled about the clinical interpretation as well as the preliminary investigations done and the necessity of further evaluation. Advantages of the evaluation and repercussions of omission of the same were explained. An informed, valid written consent was obtained.

Ultrasonography guided FNAC was done and was suggestive of adenosis with infiltrates of cells of chronic myeloid leukemia.

Tru-cut biopsy was done from left breast lump which was suggestive of invasive ductal carcinoma of breast.

Tablet Imatinib 400 mg once daily and bone marrow study were advised. Ultrasonography of breast was suggestive of carcinoma of left breast with axillary lymphadenopathy. The bone marrow studies were suggestive of chronic myeloid leukemia.

Immunohistochemistry examination was done on the breast lump of left side which was s/o triple positive status: ER/PR positive, HER2neu positive (3+), Ki67 >75%. Molecular subtype of 'Luminal type B'was inferred.

Patient was taken for left sided MRM with axillary lymph node dissection.

Histopathological examination was done on the MRM specimen, suggestive of pT_2 pN_0 pM_x (stage IIa).

Review TBD was done and Tablet Imatinib 400mg once daily lifelong and Tablet Tamoxifen 20mg once daily for 10 years was advised. The patient was then discharged with an advice to follow up on a later date.

4. DISCUSSION

Carcinoma of the breast is a frequently encountered malignancy particularly in the post menopausal females and reproductive age group females. Various studies have been performed on the association of carcinoma breast with synchronous malignancies. There have been reported cases having various synchronous malignancies such as carcinoma stomach, carcinoma ovary, carcinoma cervix, carcinoma lung etc. Many theories have been advanced to describe this increased risk and association, including the impairment of the immune system, genetic susceptibility, age, and effect of chemotherapy of the association [5,7]. The results of randomized clinical trials have suggested that patients with primary breast carcinoma have an increased risk of developing leukemia. But this risk is not well characterized [7,8,9]. Increase in risk is attributable to adjuvant therapy, especially anthracycline and alkylating agent dose intensification, and perhaps to concomitant radiotherapy use. CML was mostly described after adjuvant treatment of breast cancer, as in patients treated for lymphoma, testicular cancer, and colorectal cancer [10]. Moreover, only two studies showed an increasing specific risk of CML after breast cancer treatment [10,11]. The interval between the adjuvant treatment of breast cancer and CML was 4.7 years and this risk persisted over 25 years after breast cancer diagnosis [10]. They may also have heightened responses to the various carcinogens. Therapy-related myelodysplastic syndromes are also noted in some cases where there was detection of such a malignancy after the treatment or during the treatment of carcinoma breast. There was no evidence of synchronous presentation of chronic myeloid leukemia and carcinoma breast.

5. CONCLUSION

Chronic myeloid leukemia is an insidiously progressive condition and comparatively rare type of blood cell malignancy that begins in the bone marrow. The rate of CML in these individuals seems to reach at its peak about 10 years after the exposure. Carcinoma breast on the other hand is one of the most common causes of death in middle aged women in western countries. There are numerous factors contributing as its etiological factors. The case report emphasises on the synchronous presentation of the carcinoma breast and chronic myeloid leukemia and need for further studies on causative association.

6. SUMMARY

There are some studies in the literature which mention the synchronous presence of chronic myeloid leukemia and other secondary malignancies but there is no proper documentation in the literature about synchronous presence of carcinoma breast and chronic myeloid leukemia. Therefore, further vigilant approach towards incidence of these malignancies concurrently is of paramount importance, which can facilitate development more extensive research. Devising evidence-based treatment algorithms of treatments and sequential plan of management for associated complications and morbidities as well as advancement towards novel and inclusive pharmacotherapy is necessary. We also wanted to propagate the notion that a larger prospective, randomised study is warranted to establish the association between and needful approach of management in synchronous presentation of carcinoma breast and chronic myeloid leukemia.

DISCLAIMER

The products used for this research are commonly and predominantly used products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

CONSENT

Written and oral informed consent was obtained from the patient in this study.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

DATA AND MATERIALS AVAILABILITY

All data associated with this study are present in the paper.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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CONTRIBUTION DETAILS:

Enter the role of contributors in the first column and the names of the contributors in columns 2,3, and so on:

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Reporting guidelines for Case Report: CARE (2016)

Topic	Item	Checklist item description	Yes/ No
Title	**1**	The words "case report" should be in the title along with the area offocus.	**yes**
Abstract	**2a**	Structured abstract with the headings :Rationale, Patient concerns, Diagnosis, Interventions, Outcomes, Lessons If unstructured abstract, all the details as per the above heading to be present	**Yes**
	2b	Abstract structure outlines in the Information to Authors and contains all the information mentioned in 2a.	**Yes**
Introduction			
	3a	One or two paragraphs summarizing why this case is unique	**Yes**
	3b	Statement to be cited adequately	**Yes**
Case report			
Patient In formation	**4a**	De-identified demographic information and other patient-specific information	**yes**
	4b	Main concerns and symptoms of the patient	**yes**
	4c	Medical,family,andpsychosocialhistoryincludingrelevantgeneticinformation(also see timeline)	**Yes**
	4d	Relevant past interventions and their outcomes	**Yes**
Clinical Findings	**5**	Describe the relevant physical examination (PE) and other significant clinical findings	**Yes**
Diagnostic Assessment	**6a**	Diagnostic methods (such as laboratory testing, imaging, surveys)	**Yes**
	6b	Diagnostic challenges (such as access, financial, orcultural)	**Yes**
	6c	Diagnostic reasoning, including other diagnoses, was considered.	**Yes**
	6d	Prognostic characteristics (such as staging in oncology) where applicable	**Yes**
Therapeutic Intervention	**7a**	Types of intervention (such as pharmacologic ,surgical, preventive, self-care)	**Yes**
	7b	Administration of intervention (such as dosage, strength, duration)	**Yes**
	7c	Changes in the intervention (with rationale)	**Yes**
Follow-up and Outcomes	**8a**	Clinician and patient-assessed outcomes (when appropriate)	**Yes**
	8b	Necessary follow-up diagnostic and other test results	**Yes**
	8c	Intervention adherence and tolerability (How was this assessed?)	**Yes**
	8d	Adverse and unanticipated events	**No**
	8e	Follow-up duration and the last known status of the patient	**No**

Discussion	**9a**	Discussion of the strengths and limitations in your approach to this case	**Yes**
	9b	Discussion of the relevant medical literature.	**Yes**
	9c	The rationale for conclusions (including assessment of possible causes)	**Yes**
	9d	The primary “take-away” lessons of this case report	**yes**
	9e	Citations adequate, preferably from recent literature	**Yes**
-Informed Consent	**10a**	Mention the patient (family/ legal representative) informed consent for publication of the case details. Forminors(children),theconsentstatementshouldmentionif"parental/legalguardian consent" was obtained.	**yes**
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Figures	**11**	Figures (full face) to be sufficiently obscured Confidential data like the patient's name, date of birth, and personal identification should not be displayed in the images, including radiographs.	**yes**

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