

Case study

A RARE CASE OF SYNCHRONOUS CARCINOMA BREAST WITH CHRONIC MYELOID LEUKEMIA

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.

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

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. ^[4,6] 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. ^[5]

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.

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.

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 hypochrome 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 was 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** pt2 pn0 pmx (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.

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^[6,7]. 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.

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.

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:

Authors have declared that no competing interests exist. 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.

Ethical Approval:

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

consent:

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

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Title	1	The words "case report" should be in the title along with the area of focus.	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 Information	4a	De-identified demographic information and other patient-specific information	yes
	4b	Main concerns and symptoms of the patient	yes
	4c	Medical, family, and psychosocial history including relevant genetic information (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, or cultural)	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. For minors (children), the consent statements should mention if "parental/legal guardian consent" was obtained.	yes
	10b	Mention if the patient consent has been waived/exempted by the IRB and mention the appropriate details (including the exempt number)	
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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