

Metaplastic Carcinoma of the Breast: A Clinical Study of 7 Cases from Balochistan

Abdul Hameed Baloch^{1*}, Shakeela Daud², Jameela Shuja³, Adeel Ahmad⁴, Fateh Ali³,
Mohammad Akram³, Dost Mohammad Baloch⁵, Abdul Majeed Cheema⁶,
Mohammad Iqbal⁷, Jamil Ahmad¹

¹Department of Biotechnology and Informatics, BUIITEMS, Quetta, Pakistan

²Center for Advanced Molecular Biology (CAMB), Lahore, Pakistan

³CENAR, Quetta, Pakistan

⁴Institute of Biochemistry and Biotechnology (IBBt), UVAS, Lahore, Pakistan

⁵Lasbela University of Agriculture, Water and Marine Sciences, Balochistan

⁶Institute of Molecular Biology and Biotechnology, The University of Lahore, Pakistan

⁷Bolan Medical College/Hospital (BMC) Quetta

Email: hameedbaloch77@yahoo.com

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Abstract

Metaplastic carcinomas of the breast are rare heterogenous neoplasms characterized by adenocarcinoma with dominant areas of spindle cells, squamous and/or other mesenchymal differentiation, that comprise of <5% of all invasive breast cancers. Our objective in this study was to review the pathological features and clinical outcomes for metaplastic carcinoma of breast in breast cancer patients registered in CENAR (Center for Nuclear Medicines and Radiotherapy), Balochistan. Present study was performed on 7 patients affected with metaplastic carcinoma of breast, who were registered patients in CENAR. Informed consent was taken from the patients and BMI was calculated by measuring the height and weight of the patients. Available clinical history obtained by retrieving the patients file and a copy of biopsy report was also obtained from the file. Metaplastic carcinoma of breast was 4.11% of all 170 breast cancer cases registered in CENAR from 2010-2012. Mean age was 40 years ranging from 25 - 50 years. Four subtypes of metaplastic carcinoma of breast were reported in this study; DCIS component was present in one case and mean tumor size was 6.12 cm ranging from 3.5 - 10 cm. Metaplastic carcinomas of breast are rare heterogenous neoplasm with different characteristics, demographics and tumor biology and accounts for almost >5% of all breast cancer cases.

*Corresponding author.

Keywords

Breast Cancer, Metaplastic Carcinoma of Breast, CENAR, Balochistan, BMI, MBC

1. Introduction

Breast tumors arise mostly from glandular epithelium but in some cases glandular epithelium differentiates into non glandular mesenchymal tissue through the process called metaplasia [1]. Metaplastic carcinomas of the breast are rare heterogenous neoplasms characterized by adenocarcinoma with dominant areas of spindle cells, squamous and/or other mesenchymal differentiation [2]-[4]. Metaplastic carcinomas comprises of <5% of all invasive breast cancers [5]-[9], whereas some studies suggest that MBC (Metaplastic Carcinoma of Breast) accounts <1% of all the cases of breast cancer [4] [10]. Another subgroup of metaplastic carcinoma called as carcinosarcoma is the most rare primary malignancies of the breast found in <0.1% of the cases [9]. Metaplastic carcinoma pathologically and clinically differs from typical adenocarcinoma. In metaplastic carcinoma nodal involvement has been shown to be less common compared to typical breast adenocarcinomas, with an incidence ranging from 6% - 26%. In metaplastic carcinoma of breast, hormone receptor expression is uncommon with reported ERPR positivity in 0% - 17% of cases [11]-[13]. Similarly in other studies it has also been shown that most of the MBC cases are triple negative with a worsen prognosis [14]-[20]. MBC presents a different clinical picture as compared to other invasive carcinomas of breast, the mass of the tumor grows rapidly [4] [21] [22]. Despite of a larger palpable mass the axillary lymph nodes less likely be invaded in the patients affected with MBC with a 6% - 26% of the cases [7] [11]-[13] [17] where as in other cases of breast cancer the involvement of axillary lymph nodes is greater than 50% [23].

Present study was performed on 7 patients with metaplastic carcinoma registered in CENAR between 2010-2012. Our aim in this study was to review the pathological features and clinical outcomes for metaplastic carcinoma of breast in patients registered in CENAR.

2. Materials and Methods

This study was conducted in Balochistan University of information Technology, Engineering and Management Sciences, Quetta and Center for Nuclear Medicine and Radiotherapy (CENAR), Quetta. The study was approved by the institutional Review Board of BUIITEMS. All the cases of breast cancer affected with MBC type registered in CENAR from 2010-2012 were included. An informed consent was taken from all the patients who took part as volunteers in this study. The clinical features and outcomes of the disease were reviewed by studying the patients file. Body mass index (BMI) was calculated by measuring the height and weight of the patients. All the informations regarding the disease were obtained from the patients files. Following parameters were investigated in this study including patient's ethnicity, age, BMI, histological classification of the cancer, tumor size and grade, involvement of lymph nodes and ERPR and HER2/Neu receptor status by reviewing the pathological reports.

3. Results

Seven cases of metaplastic carcinoma of breast out of 170 breast cancer patients diagnosed between 2010 and 2012 registered in CENAR were reviewed, which was the 4.11% of all breast cancer registered cases in CENAR. All patients were female with mean age at diagnosis of 40 years ranging from 25 - 50 years. BMI of the patients was also calculated by taking their height and weight. There were three patients from Pashtoon ethnic group, two were Afghani, one was Punjabi and one from Hazara ethnic group. Out of seven patients, one was under weight, three were normal, one was overweight and two were obese. Four subtypes of metaplastic carcinoma of breast cancer were recorded in this study including adenosquamous carcinoma, monotonic spindle cell carcinoma, adenocarcinoma with spindle cell metaplasia and metaplastic carcinoma with osteoclast giant cells. All seven cases were diagnosed with IDC, and one case including with DCIS component. The mean tumor size was 6.12 cm ranging from 3.5 - 10 cm. Other pathological and clinical features observed in individual cases were; nuclear pleomorphisms, hyperchromatism, abnormal mitotic figures, tubule formations, come do and cribriforms,

fibrocystic changes including epithelial hyperplasia, adenosis, cystically dilated glands, apocrine metaplasia and microcalcification, stromal fibrosis and fibroadenoma. The features found in the metaplastic carcinoma of breast in the case affected bilaterally were; **Left Breast:** Breast tissue with foreign body giant cell reaction, fat necrosis, chronic inflammation and fibrosis. 14/35 lymph nodes found positive for tumor metastasis. **Right Breast:** Breast tissue with ductal hyperplasia, cystic changes microcalcification and focal fibroadenoma. 6/50 lymph nodes for tumor metastasis. Clinical features are shown in **Table 1**.

4. Discussion

Metaplastic carcinoma of breast is a rare, uncommon and heterogenous disease consisting of tumors admixed with epithelial and non-epithelial elements and constitute between 0.2 - 5 percent of all breast cancers [24] [25].

In current study we identified 7 breast cancer patients with metaplastic carcinoma which was the 4.11% of all the breast cancer cases registered in CENAR during the period of 2009-2012. Whereas Arce-Grijalval in their study proposed 0.6% cases of metaplastic carcinoma of breast out of all breast cancer cases registered in the Instituto Nacional de Cancerologia from 1995-2005 [26]. Mean age of patients diagnosed with metaplastic carcinoma in our study was 40 years ranging from 25 - 50 years. In their study Arce-Grijalval the mean age of the patients of metaplastic carcinoma was 47.9 years ranging from 24 - 74. But in another study carried out by Brenner R.J. found the median age was 65.5 years ranging from 33 - 87 years and study conducted by Beatty J.D. reported the mean age 55 years ranging from 26 - 80 years [26] [27]. In current study we identified four subtypes of metaplastic carcinoma of breast including adenosquamous carcinoma, monotonic spindle cell carcinoma, adenocarcinoma with spindle cell metaplasia and metplastic carcinoma with osteoclast giant cell. War-gotz *et al.* in their series of studies described five subgroups of metaplastic carcinoma of breast including matrix-producing carcinoma, spindle cell carcinoma, carcinosarcoma, squamous cell carcinoma of ductal origin and metaplastic carcinoma with osteoclast giant cells [7] [11] [12] [28] [29]. Studies suggest that associated ductal carcinoma in situ might be present in 50% of cases [6]. In our study the DCIS component was present in one case which was the 14.23% of all the cases with metaplastic carcinoma of breast. The mean tumor size was 6.12 cm ranging from 3.5 - 10 cm in current study. Most studies suggest a large palpable masses with metaplastic carcinoma of breast [30]. In a study carried out by Kurain and Al-Nafussi presents tumor sizes 2.2 - 10 cm [31]. Park *et al.*, in their study reported mean tumor size 4.2 cm and similarly [32] and Kaufman *et al.*, reported in their study the median tumor size was 4.8cm ranging from 2.5 - 18 cm [22]. whereas smaller tumor sizes have also been reported with metaplastic carcinoma of breast but data are sparse. In a study carried out between 1976 and 1997, the median tumor size was reported 3.4 cm ranging from 0.5 - 0.7 cm [17]. In another study from Nottingham, England the mean tumor size was reported 1.6 cm ranging from 0.7 - 2.4 cm [33].

5. Conclusion

Metaplastic carcinomas of breast are rare heterogenous neoplasm with different characteristics, demographics and tumor biology and accounts for almost >5% of all breast cancer cases.

Table 1. Clinical features of the patients diagnosed with metaplastic carcinoma of breast.

| Patient | Ethnicity | Age | BMI | Tumor Size | Tumor Grade | Nodal Status | DCIS | ERPR Status | Laterality |
|---------|-----------|-----|-------|------------|-------------|----------------|------|------------------|------------|
| 1 | Pashtoon | 25 | 17.78 | 7 cm | III | 2/8 | - | ERPR+ | Left |
| 2 | Pashtoon | 35 | 36.7 | 10 cm | III | 3/16 | DCIS | ERPR- | Left |
| 3 | Pashtoon | 40 | 31.25 | 6 cm | III | 1/8 | - | Tripple negative | Left |
| 4 | Afghani | 50 | 20.07 | 9 cm | III | 1/20 | - | ERPR- | Right |
| 5 | Afghani | 35 | 24 | 3.5 cm | II | 14/35 and 6/50 | - | ERPR+ | Bilateral |
| 6 | Panjabi | 40 | 23.17 | 4 cm | II | 3/27 | - | ERPR+ | Left |
| 7 | Hazara | 40 | 29 | 4 cm | III | 4/9 | - | ERPR- | Left |

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