ORIGINAL ARTICLE

MUCINOUS CARCINOMA OF BREAST: A RARE TUMOUR WITH FAVOURABLE PROGNOSIS - 10-YEAR EXPERIENCE FROM A SINGLE CENTRE

Irfan Ul Islam Nasir, Haffsa Arif, Muhammad F. Shah, Awais A. Malik, Abdul W. Anwer, Muhammad T. Pirzada, Mariam Salim, Amina I. Khan

Department of Surgical Oncology, Shaukat Khanum Memorial Cancer Hospital and Research Centre, Lahore, Pakistan

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Abstract

Purpose: The purpose of this study was to describe the biological behaviour of mucinous breast carcinoma (MBC) regarding their clinical presentations, pathological features, prognosis and survival.

Methodology: We conducted this retrospective study from 2006 to 2015 (10-year duration) and included all the patients who presented with mucinous carcinoma of the breast at any age. We excluded all the patients who presented with invasive ductal carcinoma or other rare breast tumours. Each patient with mucinous carcinoma breast was categorised in terms of diagnosis, surgery, chemotherapy and outcome. For categorical variables, Chi-square test was used. Kaplan–Meier curves were used to determine estimated overall survival. Data analysis was carried out using the SPSS 20.

Results: In total, 8841 patients with breast carcinoma presented during the study period. Of these, 74 patients were diagnosed as cases of MBC, constituting <1%. Family history of breast carcinoma was positive in 20% of patients. Most of the women were postmenopausal (66.2%) falling in BIRADS Category 4 and 5 (32.4% each). Considering laterality tumours had almost equal distribution between the right and left side. Breast-conserving surgery was performed in 47.3% of women as compare to modified radicle mastectomy in 52.7% of women. Most of the patients had pathological T2 (51.4%), N0 (81.1%) and moderately differentiated (69%) mucinous carcinoma. ER was positive in 85% of patients, PR in 80% and H2N in 74.6% of patients. Neoadjuvant chemotherapy was given to 20 patients (27%) and adjuvant chemoradiotherapy was given to 51 patients (69%). Metastasis occurred in 12 (16.2%) of our patients while 62 (83.8%) were metastasis free on long-term follow-up, with bones being the most common site of metastasis, occurring in 6 patients (8.1%) followed by lungs, occurring in 4 patients (5.4%). A total of 32 (43.2%) patients are alive, and on regular follow-up, 3 (4.1%) died during the course of follow-up and 39 (52.7%) are lost to follow-up with a median survival of 60 months and an overall 5-year survival rate of >95%.

Conclusion: Mucinous carcinoma is a rare breast carcinoma with a good prognosis.

Key words: Breast cancer, mucinous carcinoma, prognosis

Introduction

Mucinous carcinoma of breast is one of the rare breast tumours, having an incidence of 1–6% amongst all types of the primary carcinomas of breast.[1] Mucinous breast carcinoma (MBC), sometimes called colloid carcinoma, is a type of invasive ductal cancer.

According to the current General Rules for Clinical and Pathological Recording of Breast Cancer, mucinous neoplasms are defined as the ones where a certain type of cell able to produce mucus, makes the major bulk of tumour.[2] The neoplasm is actually composed of islands of tumour cells floating in lakes of extracellular mucin.

Correspondence: Dr. Irfan Ul Islam Nasir, Surgical Oncology department, Shaukat Khanum Memorial Cancer Hospital and Research Centre, Lahore, Pakistan.
Email: kmcite905@hotmail.com

The prevalence of MBC is more in women over 60 years of age.[3] MBC is considered to be a favourable diagnosis because it has lower metastatic nodal involvement incidence,[4] better histological differentiation and a higher expression of oestrogen and progesterone receptors.[5,6] MBC is divided into pure (PMBC) and mixed (MMBC) subtype. The basis of this classification is on the quantification of tumour cellularity. A tumour with >50% of mucinous component is regarded as a mucinous neoplasm.[7] However, clear-cut criteria for differentiation between a pure and a mixed subtype of MBC have not yet been defined.[8-10] Mixed types of ductal carcinomas with both mucinous and non-mucinous components (incidence of 2%) need to be differentiated from PMBC as they have prognosis identical to their non-mucinous components.[11,12] Short-term survival has been documented to be superior in pure mucinous subtype as compared to their mixed counterparts.[13] However, long-term survival is reported to be similar and the prognosis even tends to go downhill on longer follow-up.[14,15] Some researchers claim that the recurrence rates in mucinous cancers are identical to invasive ductal carcinoma after 10–15 years of follow-up.[16-18] In the present study, we did a retrospective analysis of patients with MBC to describe the biological behaviour of MBC regarding their clinical presentations, pathological features and prognosis. We also discuss the surgical and chemotherapeutic treatments that patients received and compare their affectivity.

Methodology

We conducted this retrospective study at Shaukat Khanum Memorial Cancer Hospital and Research Centre from 2006 to 2015 (10-year duration) and included all the patients who presented with mucinous carcinoma of the breast at any age. We excluded all the patients who presented with invasive ductal carcinoma or other rare breast tumours. Hospital records of all the patients with mucinous carcinoma breast were analysed. A set of parameters were defined to record initial clinical presentation and examination, imaging and laboratory findings. A decision of multidisciplinary team meetings, surgical treatment, neoadjuvant, post-operative chemotherapy and radiation data was retrieved. Each patient with mucinous carcinoma breast was categorised in terms of diagnosis, surgery, chemotherapy and outcome. For categorical variables, Chi-square test was used. Overall survival was calculated by subtracting date of the last follow-up from date of surgery in the hospital. Kaplan–Meier curves were used to determine estimated overall survival and Cox regression analysis was performed to determine the significance of individual variable. All analyses were performed on the SPSS version 20.

Results

A total of 74 patients presented to our hospital during the study period with MBC with a median age of 57 years (standard deviation ± 14.5). Family history of breast carcinoma was positive in 20% of patients. Most of the women were postmenopausal (66.2%) falling in BIRADS Category 4 and 5 which are 32.4% each. Tumours were almost equally distributed between the right and left side. Breast-conserving surgery was performed in 47.3% of women as compared to modified radicle mastectomy in 52.7% of women as shown in Table 1.

Table 1: Patient characteristics

Characteristics	Total number *n*=74 (%)
Family history	
Positive	15 (20.3)
Negative	59 (79.7)
Unifocal/multifocal	
Single	70 (94.6)
Multiple	4 (5.4)
Menopausal status	
Premenopausal	25 (33.8)
Postmenopausal	49 (66.2)
BIRADS	
Category 0	10 (13.5)
Category 1	1 (1.4)
Category 2	4 (5.4)
Category 3	4 (5.4)
Category 4	24 (32.4)
Category 5	24 (32.4)
Category 6	7 (9.5)
Laterality	
Right	42 (56.8)
Left	32 (43.2)
Type of surgery	
BCS	35 (47.3)
MRM	39 (52.7)

Most of the patients were having pathological T2 (51.4%) followed by T1 (43.5%). 81.1% of patients had no nodal disease at presentation. Moderately differentiated mucinous carcinoma was most common (69%). ER was positive in 85% of patients, PR in 80% and H2N in 74.6% of patients. Neoadjuvant chemotherapy was given to 20 patients (27%) and adjuvant chemoradiotherapy was given to 51 patients (69%) as shown in Table 2. On long-term follow-up, metastasis occurred in 12 (16.2%) of our patients while 62 (83.8%) were metastasis free, with bones being the most common site of metastasis, occurring in 6 patients (8.1%) followed by lungs, occurring in 4 patients (5.4%). A total of 32 (43.2%) patients are alive, and on regular follow-up, 3 (4.1%) died during the course of follow-up and 39 (52.7%) were lost to follow-up with a median survival of 60 months and an overall 5-year survival rate of >95%.

Table 2: Disease stage and treatment

Treatment characteristics	Total number *n*=74 (%)
Pathological T-stage	
1	32 (43.3)
2	38 (51.4)
3	4 (5.4)
Pathological N-stage	
0	60 (81.1)
1	7 (9.5)
2	5 (6.8)
3	2 (2.7)
Grade of tumour	
Well differentiated	13 (17.5)
Moderately differentiated	51 (69.0)
Poorly differentiated	10 (13.5)
Her 2 Neu	
Negative	12 (16.2)
Equivocal	7 (9.5)
Positive	55 (74.3)
Oestrogen receptor	
Positive	63 (85)
Negative	11 (15)
Progesterone receptor	
Positive	59 (80)
Negative	15 (20)
Neoadjuvant chemotherapy	
Yes	20 (27)
No	54 (73)
Adjuvant radiotherapy	
Yes	51 (69)
No	23 (31)
Metastasis	
Yes	12 (16.2)
No	62 (83.8)

Discussion

In the past 10 years from 2006 to 2015, the total number of patients diagnosed with breast cancer at our institution was 8841. Of these, only 74 patients were diagnosed with MBC constituting <1% of total patients, which is similar to what has been reported in literature.[1,2] Furthermore, the frequency might be lower in our population because we are dealing with unscreened population. Most patients were of old age with a median age of 57 years. This is also similar to what has been reported in literature. The average age of occurrence for this tumour is >60 years.[3] Most of the patients (66.2%) were postmenopausal as compared to 33.8% presented in premenopausal age group.

Most of the tumours presented to us were either T1 or T2. This is explained by the fact that mucinous tumours are slow-growing tumours with a very low metastatic potential. Our patients had no metastasis at presentation. Surgical options for these patients included both mastectomies and breast conservation. Due to low metastatic potential, these tumours can grow to large sizes without any evidence of metastasis. This is one reason that most of these patients underwent mastectomies due to the large size of the tumours. Neoadjuvant therapy was offered to 27% of patients. These tumours have been shown to have a high expression of hormone receptors.[11,12] 85% of our patients were ER positive, 80% were PR positive and 74% were H2N positive. Due to high percentage of hormone receptor expression, these tumours show good response to adjuvant endocrine and chemotherapy. Adjuvant therapy was offered to 69% of our patients.[12-15]

Mucinous breast cancer is associated with low rates of local and distant recurrence and outstanding 5-year disease-free survival rates both in literature and in our series. A large retrospective comparative study showed that PMC of the breast had less aggressive behaviour compared to infiltrative ductal carcinoma, and the favourable outcome still remained after 20 years[13]. In

our series, only 12 patients developed metastasis. There were only 3 deaths (4%). All other patients were alive at 5-year follow-up.

Limitations of our study include, as it is a retrospective data, most of our patients are lost to follow-up. The reason for that is the fact that these patients mostly belong to far-flung area, have long travelling distances and complete lack of education and finances. Yet, this is the first attempt at reporting a large data from any of the centres from Pakistan. Based on this data, we intend to prospectively include parameters of assessment, which will enable us, to improve our results as well as data set will be much stronger.

Conclusion

MBC of the breast has a favourable prognosis. It has low rates of metastasis with a very good 5-year survival rates.

Conflict of Interest

The authors declare that they have no conflict of interest.

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