

Radiological Perspective of Metastatic Breast Cancer in CENAR, Quetta

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Abstract

Background / Purpose: The study was conducted to evaluate the Breast cancer patients with metastasis to different body regions. **Aims and Objectives:** The primary aim was to highlight the most common site of metastasis and different Sonographic patterns in breast cancer patients at CENAR, Quetta. The secondary aim was to determine the average age of breast carcinoma (Ca) presentation. **Material and Methods:** A two year retrospective study of breast carcinoma diagnosed and treated at our centre was conducted. 278 patients pathologically proven invasive carcinoma breast were registered at

CENAR from 1st January 2010 to December 2011 were analyzed. **Results:** During the study period, 278 patients were registered as Ca breast patients out of which 109 (39%) patients developed metastasis during or after treatment or initially at registration, majority of the patients were with liver metastasis 46 (42%) patients and most common Sonographic pattern was hypo echoic with 26(57%) patients. Most common age group was 25-40 years with 125(45%) patients, followed by 41-55 years with 97(35%) patients. **Key words:** Breast carcinoma, Liver metastasis & Ultrasound imaging.

INTRODUCTION

Breast cancer is the malignancy of the cells that constitute the breast tissue. Breast cancer is the common malignancy of females throughout the world with one million new cases each year and among females it is the second leading cause of death¹. Each year 1 to 2 women in every thousand will be newly diagnosed with breast cancer, 75% of these will be post menopausal women². The term, metastatic, describes a cancer has spread to the distant organs from the original tumor site.

Breast cancer has the potential to spread to almost any region of the body³.

LIVER METASTASES

Liver is the third most common site for breast cancer to spread after bone and lungs. Studies show that first metastasis go to the liver in approximately 10 percent of cases. Two third of women with metastatic breast cancer eventually have its spread to the liver. Because blood from all parts of the body must pass through the liver for filtration, cancer cell from other organs and tissues easily reach the liver, where they can lodge and grow into secondary tumors. Imaging studies are useful in locating specific areas of abnormal tissue in the liver. Liver tumors as small as 2.5 cm

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across can be detected by ultrasound or CT. ultrasound however can not tell the difference between a hepatoma and other abnormal masses or nodules of the tissues in the liver. Sample of liver tissue biopsy needed to make the definitive diagnosis of primary liver tumor. CT or Ultrasound can be used to guide the oncologist in selecting the best location for obtaining biopsy sample⁴. The liver is common 20% site of intra abdominal metastatic disease.

Incidence of metastatic carcinoma is 20 times greater than primary Ca metastasis, represents 22% of all liver tumors in patients with known malignancy⁵.

PRESENTATION

- Hepatomegally (70%)
- Abnormal liver enzyme (50-75%)

Location: Both lobes (77%), right lobe (20%) & left lobe (3%).

Number: Multiple (50-98%) & Solitary (2%).

Size: > 33% smaller than 2cm

Patterns of breast cancer metastasis in liver on grey scale ultrasonography can be

1. Hypo echoic or hypo vascular 65%.
2. Hyper echoic Ca 21%.
3. Mixed Echogenecity 31%.
4. Diffuse or Infiltrative metastases (Rare)

The sensitivity of conventional ultrasonography for liver metastasis is relatively poor (53-77%), inferior to that of computed tomography (CT) and magnetic resonance imaging (MRI)⁶. The main limitation of Ultrasound is high operator dependency, inability to detect lesions less than 1cm in size, leading to low specificity. The presence of diffuse liver disease also lowers the sensitivity of Ultrasound for detection of focal lesions. Similarly, Pseudolesions, such as focal fatty infiltration or focal fatty sparing, are sometimes difficult to differentiate from other pathologic liver lesions. On the other hand, intraoperative ultrasound and a recently

introduced laparoscopic ultrasound are highly sensitive for detecting liver lesions not seen on routine preoperative imaging, for assessing the relationship between tumors and hepatic vessels, and for assessing vascular patency, like wise, endoscopic ultrasound is useful for assessing the left lobe of liver and lymph nodes in gastro hepatic ligaments and Fine Needle Aspiration of liver lesions can be performed under endoscopic ultrasound guidance. The recent addition of contrast agents (not yet performed in United States) for imaging the liver has shown promise in characterization of various hepatic tumors³.

LUNG METASTASES

Between 60 and 70% of women who die from breast cancer have eventually had it spread to their lungs. In 21 % cases the lung is the only site of metastasis (spread).The most common signs of the lung metastases are shortness of breath and dry cough. In some cases, women will not experience any symptoms; cancer will only be detected by chest X-ray or CT scan⁷.

Chest X-ray (CXR) is usually the first examination performed to detect pulmonary metastasis. Chest radiography often reveals only a single pulmonary metastasis is even when more than one such lesion is present. Computed tomography (CT) scanning has higher resolution than CXR, revealing more and smaller nodules than other techniques does. CT scanning is more appropriate for identifying multiple pulmonary metastases, being better able to detect lesion smaller than 10mm in diameter⁸.

BONE METASTASES

Approximately 25% breast cancer spread first to bone. The bones of the spine, ribs, pelvis, skull and long bones of the arms and legs are most often affected⁷. The destructed bone had several pattern on radiograph, which appears to be related to relate to variations in the growth rate of the

tumor. There are 3 typical radiographic patterns of metastatic disease

- Osteolytic
- Osteoblastic &
- Mixed

Plane X-rays of bones is fastest, least expensive and the most readily available technique to diagnose bone metastasis. It gives the best integration of over all bone structure and alignment. Technetium disphosphonate bone scans are extremely valuable in identifying occult lesion and in diagnosing metastatic disease. Where as nearly 30-50% of bone mineral must be lost for a lesion to appear on plain radiograph, bone scan shows disease much earlier⁹.

MATERIAL AND METHODS

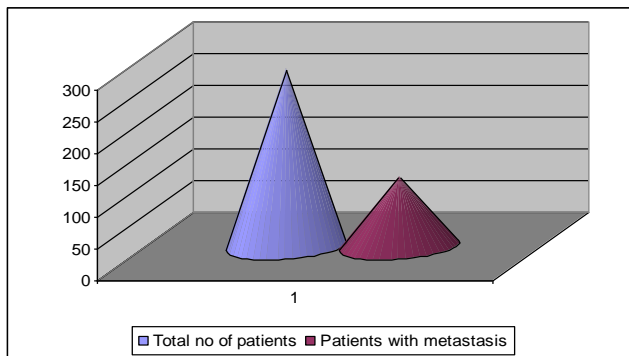
The record review was carried out of last two years (1st January 2010 to December 2011) in the centre for Nuclear medicine and Radiotherapy (CENAR), Quetta. During this period, files of all registered patients were reviewed and data collected. Statistical percentage and graphs were used to evaluate the results.

RESULTS

In this study, 278 patients of breast cancer were registered in 2010-11 at CENAR, Quetta out of which 109 (39%) patients developed metastasis during or after treatment or initially at registration. Most common site of breast carcinoma was liver metastasis with 46(42%) patients and most common Sonographic pattern was hypo echoic with 26 (57%) patients. Most common age group was 25-40 years with 125(45%) patients, followed by 41-55 years with 97(35%) patients. Results are summarized in Table1-6

Table-1
Breast cancer patients with Metastases in 2010-11 (Total no. of patients: 278).

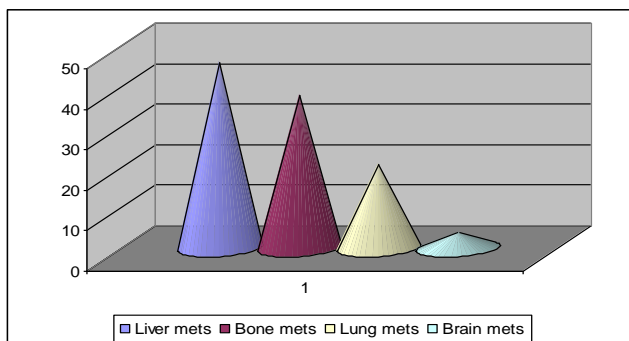
Variables	No. of patients	Percentage
Total no of analyzed patients	278	100
Total no. of patients with metastasis	109	39



In this study, 278 patients of breast cancer were registered in 2010-11 at CENAR, Quetta out of which 109 (39%) patients developed metastasis during or after treatment or initially at registration while in remaining 169 patients, majority of the patients remain non metastatic and some patients did not come for follow up.

Table-2
Body region wise distribution of metastasis (Total no. of patients: 109)

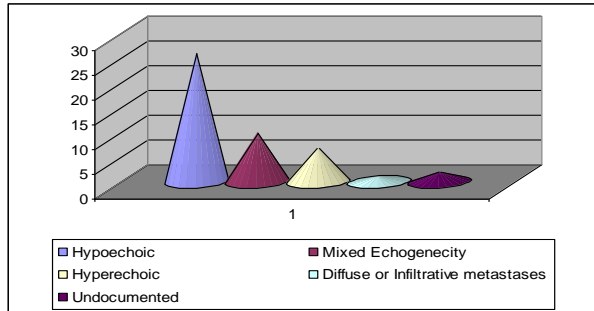
Variables	No. of patients	Percentage
Total no. of patients with metastasis	109	100
Liver Metastases	46	42
Bone Metastases	38	35
Lung Metastases	21	19
Brain Metastases	04	4



In this study, Hepatic (Liver) metastasis was the most common distant metastasis with 46 patients (42%).

Table-3
Sonographic pattern of Liver Metastases (Total no. of patients: 46)

Variables	No. of patients	Percentage
Total no of patients	46	100
Hypo echoic	26	57
Mixed Echogenecity	10	22
Hyper echoic	07	15
Diffuse or Infiltrative metastases	01	02
Undocumented	02	04



In this study the most common Sonographic pattern was Hypo echoic with 26 (57%) patients.

SONOGRAPHIC PATTERN

Figure-1
Hypoechoic

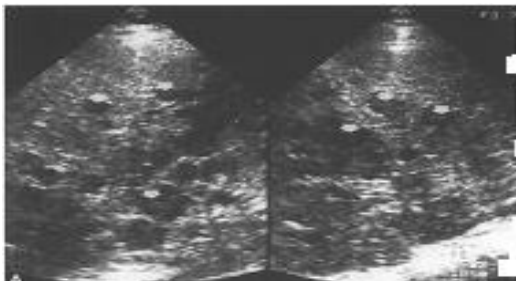


Figure-2
Hyperechoic

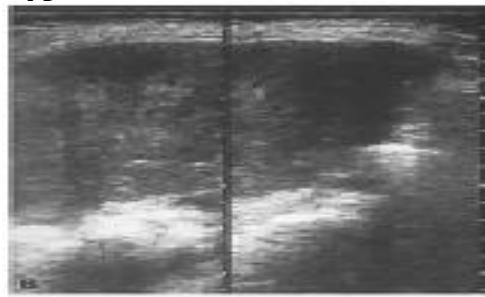


Figure-3
Diffuse



Figure-4
Mixed

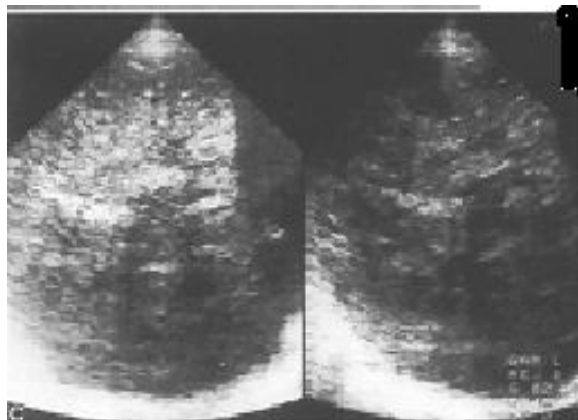
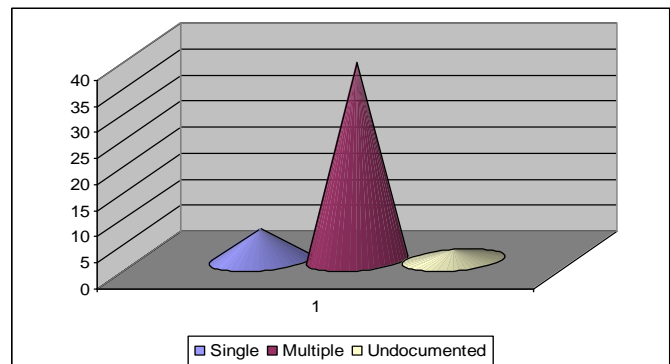


Table-4
Number of metastatic liver lesion. (Total no. of patients: 46)

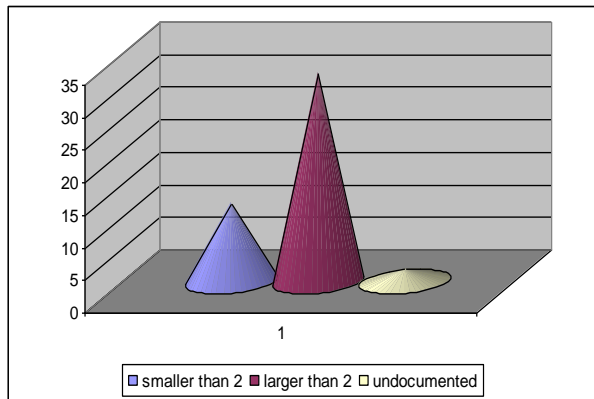
Variables	No. of patients	Percentage
Total no of patients	46	100
Single	06	13
Multiple	38	83
Undocumented	02	04



In this study majority of the patients with multiple metastatic liver lesion (38 patients)

Table-5
Size of metastatic liver lesion (Total no. of patients: 46)

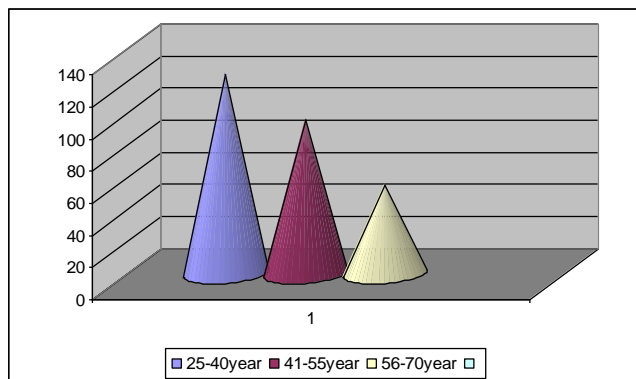
Variables	No. of patients	Percentage
Total no of patients	46	100
Smaller than 2cm	12	26
Larger than 2cm	32	70
Undocumented	02	04



In this study the most common size of metastatic liver lesion is larger than 2cm with 32(70%) patients.

Table-6
Age wise distribution of patients (Total no. of patients 278)

Variables	No. of patients	Percentage
25-40years	125	45
41-55years	97	35
56-70years	56	20



In this study the most common age group was 25-40years with 125 patients, followed by 41-55 years with 97 patients

DISCUSSION

Breast cancer is the most common single cause of death among women aged 35-54 years ². 98 percent of patients with breast cancer that has not spread beyond the breast live five years or more, while only 23 percent of patients whose cancer has spread to other organs survive five years ¹⁰.

Breast cancer is more common in Pakistan at a young age compared the western population where it is common in old age. The annual rate of age standardized breast cancer in Pakistan is 69.1/100,000. In Pakistan, the burden of breast cancer disease is high with the late stage presentation being a common feature. It has been observed that more than half of the patients present in advance stages (Stage III and stage IV) ¹¹. Another study performed, it was found that the women in Pakistan get the breast cancer disease at younger age as compared to western women with more lesions and more prone to metastatic cancer ¹² which is comparable to our study.

Metastases to the liver are a common complication of this condition occurring in up to 20% of patients. The liver is most common site of intra abdominal metastatic disease ². In our study the liver is most common site of metastases (46%) even greater than European studies.

In our opinion, the aggressive nature of the disease and advance stage at presentation is probably the cause. In our study Bone and Pulmonary metastasis could not be further evaluated as it is retrospective study design and our study is basically on ultrasound imaging, the bone scan is done with Tc 99 for bone metastasis and chest x-ray for pulmonary metastasis which are different radiological modalities.

The pattern of Sonographic presentation of liver metastases as given in literature is mostly hypo echoic (65%) less commonly mixed echogenicity(31%), hyper echoic (21%), and

diffuse pattern is rare[5]. These are comparable to our study i.e hypo echoic (57%), mixed echogenicity(22%), hyper echoic (15%), and diffuse pattern(2%).

According to book of radiology review, the number of liver metastases are multiple (50-98%) and solitary/single (2%)⁵ and in our study multiple (82%) and single (13%) is comparable to our data.

Regarding size of liver metastases > 33% smaller than 2cm⁵ while in our study 26% smaller than 2cm and 70% larger than 2cm which is comparable to our data.

The present study has clearly shown that breast cancer presents in the young age group (30-40years) was at an advance stage (liver, bone, and lung & brain metastasis) in the local set up. These facts may indicate that the disease in the area is probably more aggressive and that there may be social and economical reasons and lack of awareness due to which patients do not come up for medical consultation in early stages of the diseases.

CONCLUSION

Our this study has clearly shown that majority of the patients were with liver metastasis 46 (42%) patients, most common Sonographic pattern was hypo echoic with 26(57%) patients and most common age group was 25-40 years with 125 (45%) patients. Ca breast still a common problem presenting at young to middle age group with the commonest metastasis to liver followed by bone and lung presenting due to lack of screening & awareness program. In our opinion, the aggressive nature of the disease and advance stage at presentation is probably the cause. This should be evaluated through further research why liver is being the most common metastatic site for breast cancer in this region.

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