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Placement of Tissue Marker and Wire Localization Before Conservative Breast Surgery of Invasive Ductal Carcinoma of Breast.

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Abstract:
Radiologist use marker clips as tissue marker before starting neoadjuvant chemotherapy to place in the cancer site to see the response, later in mammographic image this marker helps identify cancer disappear largely or not. It is also to help prevent taking repeated biopsy sample from same site. If mammo shows normal appearance but ultrasonogram shows abnormality, then a marker need to place during ultrasonogram and re mammogram is done to locate the lesion. Most lumps can be felt but sometimes we cannot actually feel anything but changes in breast may be found in mammogram or ultrasonogram. So it needs a wire localization and a marker to guide us to the area for surgery.This is done either by using a skin marker under USG guidance or by placing a wire into the abnormality either by mammogram or ultrasonogram guidance.

Keywords: *Tissue Marker, Wire localization, Conservative breast surgery*

Introduction:

Breast carcinomas are usually adenocarcinoma which starts in either ducts or lobules. In situ carcinomas are precancerous started in duct or lobe and does not spread into rest of breast tissue. whereas invasive (Infiltrating) carcinomas spread (invade) into surrounding areas[1]. Carcinoma of Breast can be treated systemically. Such as chemotherapy, targeted therapy, hormone therapy, immunotherapy, radiation therapy[2].

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Case Report:

A 39 years old female, nonsmoker and nonalcoholic reported to CMH Dhaka on 23rd march 2021 with the complaints of lump in upper and outer part of right breast for last 3 months. Patient was conscious, anxious looking, oriented and afebrile. Blood pressure and other vital parameters were within normal limit. On local examination, an ill-defined, non-tender, fairly large lump was palpated which was not fixed with underlying structure and overlying skin. A palpable lymph node(LN) in right axilla was also found. Chest X-ray revealed no significant abnormality. Routine blood investigations were unremarkable.

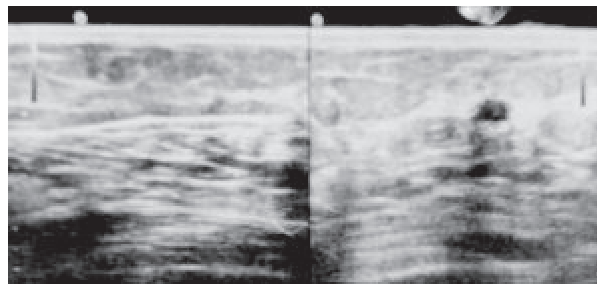

Fig.-1: *Ultrasonogram on both breasts on 25th January 2021*

Spot image of USG showed almost irregular hypoechoic area with mild posterior echo enhancement in right breast at 11 O'clock position. Lesion is measuring about (3.8 cm X 3.7 cm). No ductal dilatation or marginal calcification or enlarged lymph node was found. Left breast was normal. So, radio logical impression was possibly small irregular solid mass lesion in right breast.(Fig-1)

After almost 2 months another USG of breast was done on 23rd March 2021.

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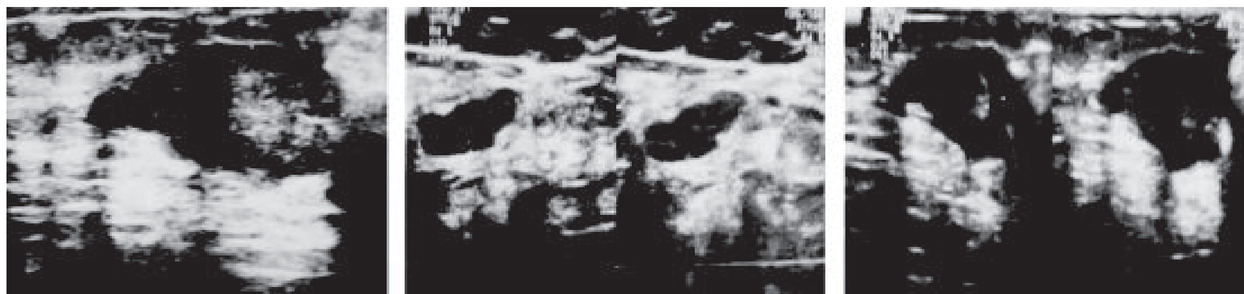

Fig.-2: *Ultrasonogram of both breasts on 23rd March 2021*

Spot images showed an irregular almost oval shaped hypo echoic area (measuring about 2.5 cm X 1.5 cm) with posterior echo enhancement at 9'0 clock position. No ductal dilatation, calcification was seen which was more in length than its width. The lesion was 11 mm away from the skin surface. An enlarged LN (1.4 cm X 1.0 cm in size) was seen in right axilla, which was hypoechoic with loss of echogenic hilum. Left breast was normal. Suggestive of Irregular solid mass with axillary lymphadenopathy (Rt) suggesting - Mitotic lesion-BIRADS- 4 C.(Fig-2)

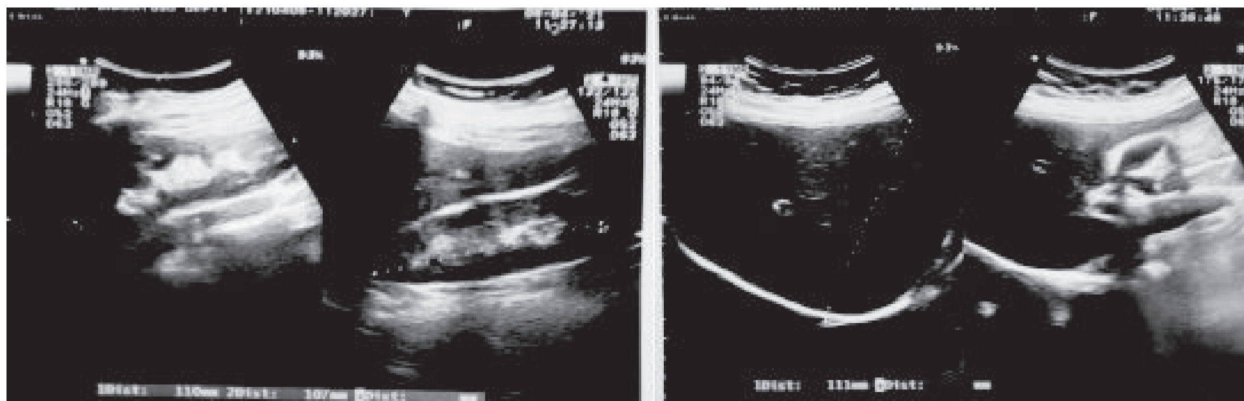

Fig 3: *Ultrasonogram of whole abdomen on 08th April 2021*

An ultrasonogram of whole abdomen was done on 08th April 2021 to see any metastasis but showed normal findings.(Fig-3)

An FNAC was done on 25th March 2021 which showed Breast Lump (Right). Although it was suggestive of Benign breast lesion but considering the clinical features Core Biopsy was highly recommended. Core Biopsy was performed on 03rd April 2021 where all the 4 cores showed features of invasive ductal carcinoma, the tumour cells were arranged in sheets, cords as well as singly infiltrating into surrounding stroma. The tumour was moderately differentiated. So Histologic Diagnosis was moderately differentiated invasive duct cell carcinoma. Immuno-histochemistry was done on 13th April 2021 and moderately differentiated invasive duct cell carcinoma was reconfirmed.

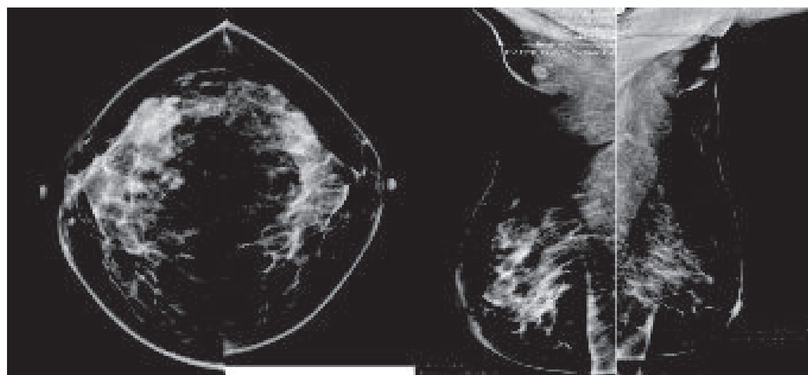

Fig .-4: *Mammogram of Both Breasts done on 18th April 2021*

Spot Mammogram images showed irregular lobulated, partially defined, added density area, in upper-outer quadrant of right breast. Breast density was BIRADS category C. No micro or macro calcification was seen. Skin was thickened at the areolar region. Retro mammary spaces were clear. A sub centimetric, round shaped lymph node was seen in right axilla with loss of central fatty hilum. Lt breast was normal. So the radiological diagnosis was a known case of carcinoma breast (Rt) with a partially defined, lobulated breast lesion (Rt)-consistent with mitotic lesion, falls in BIRADS-6 with a subcentimetric suspicious right axillary lymph node-could be metastatic deposit.(Fig-4)

MR images showed few small signal intensity change areas in sub cortical deep white matter region of both cerebral hemispheres, hypo intense on T1, hyper-intense on T2W & FLAIR images. DW/ADC showed no restriction of diffusion. GRE showed no blooming effect. The normal flow voids were demonstrated within the major cerebral vessels. No mid line shift was evident. The sella & parasellar structures appeared normal. Optic chiasma & pituitary gland revealed no abnormality. The brain stem and the cerebellum were normal in morphology and signal characteristics. Both cerebello-pontine angles were clear. The visualized cranial nerves were unremarkable. No evidence of any abnormality in para nasal sinuses were seen. Eyeball, extra ocular muscles & optic nerve of both sides were normal in signal characteristics. So the radiological diagnosis was known case of carcinoma breast with axillary lymph node (Rt) metastasis with Micro vascular ischemic change in both cerebral hemispheres (Fig-6) .

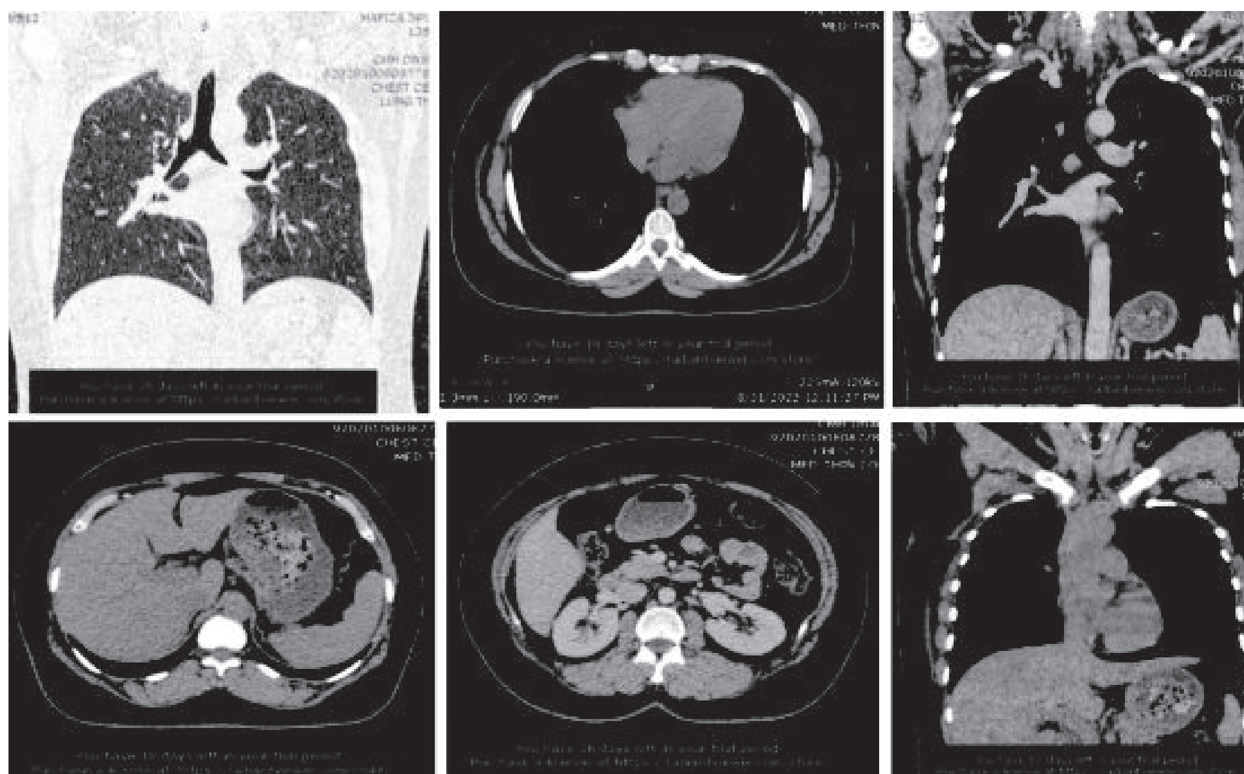

Fig.-5: *Non contrast axial and reformatted coronal CT scan of chest done on 31st august 2022 Multi axial images showed m0 metastasis, other features show no abnormality.(Fig-5)*

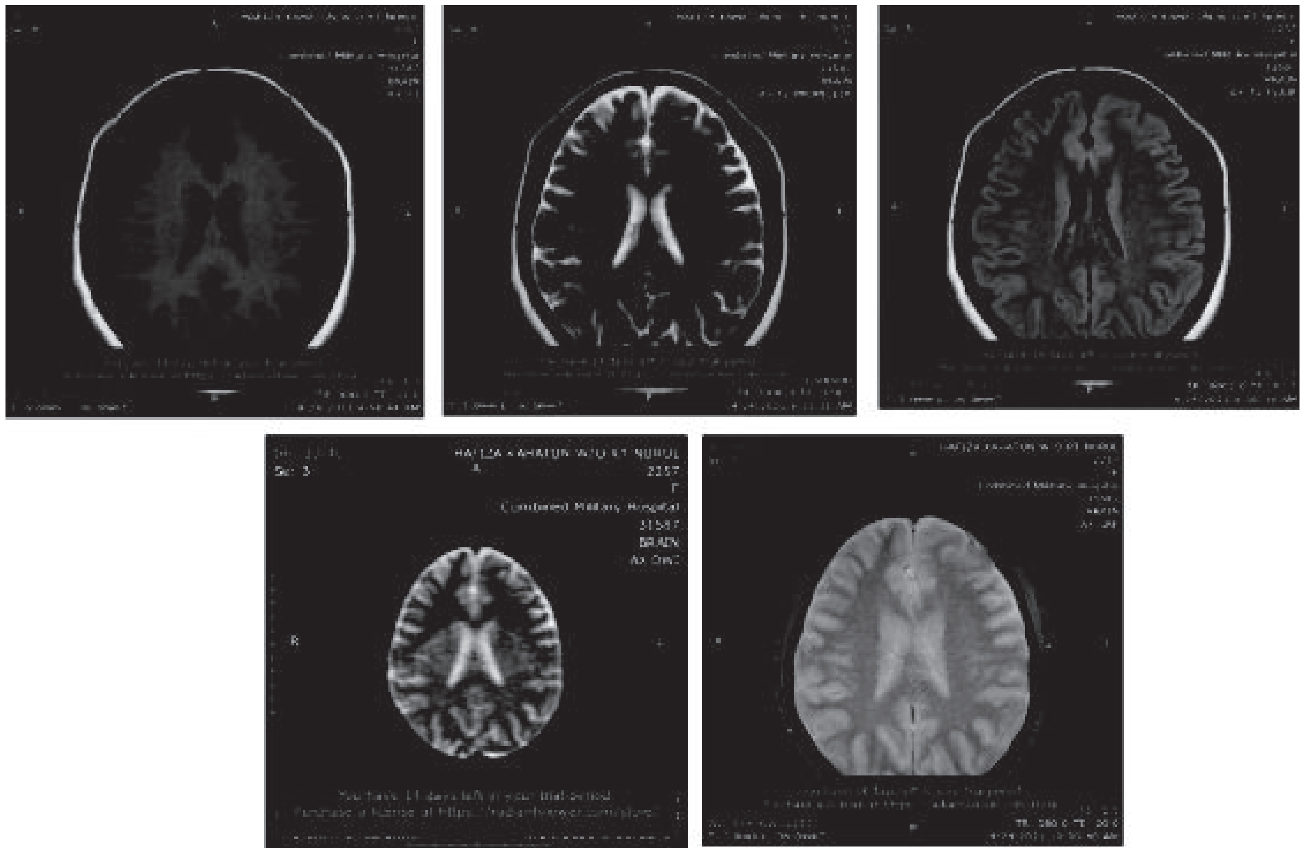

Fig.-6: *MRI of Brain was done on 24th April 2021*

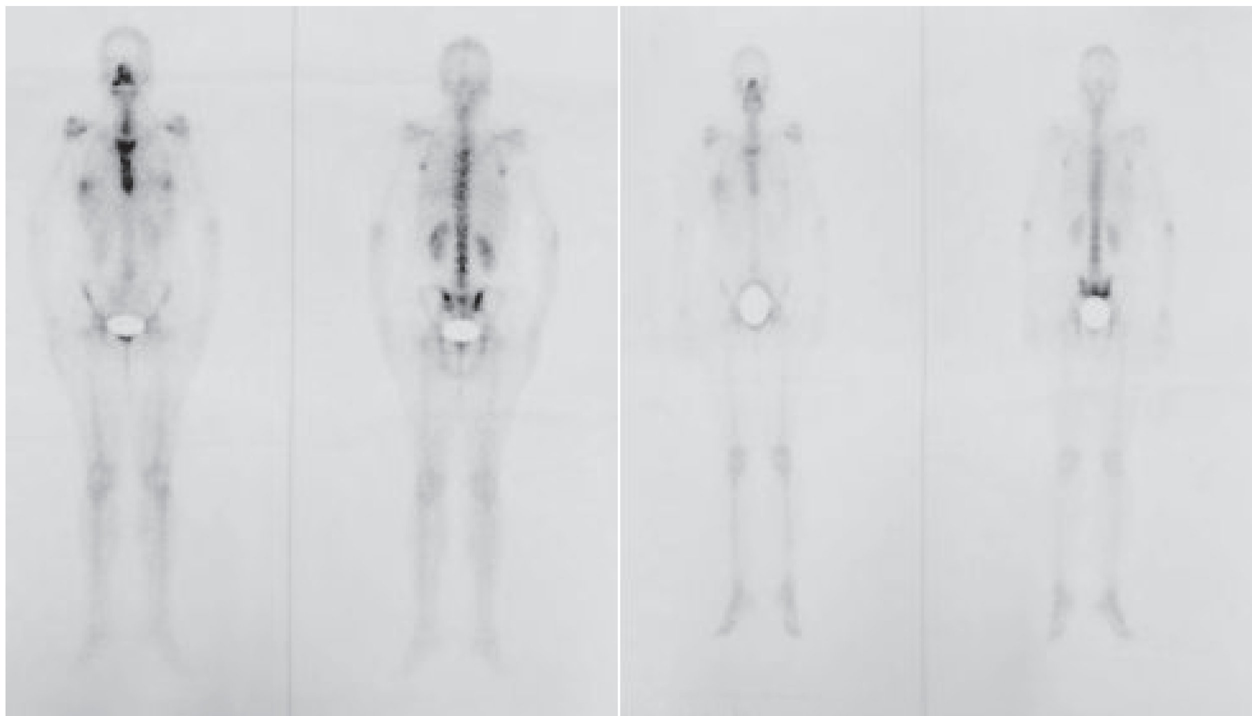

Fig 7: 2 *whole body bone scan done on 19th April 2021 and on 06th September 2022.*

Delayed static images showed physiological and symmetrical bio-distribution of radiotracer throughout skeletal system. Degenerative pattern of changes was seen in the shoulder and knee joints. Both kidneys showed normal MDP excretion which indicated no evidence of osteoblastic skeletal metastasis.(Fig-7)

Basing on above history, clinical examination, USG, mammogram, CT, and MRI final diagnosis was moderately differentiated invasive duct cell carcinoma of breast (Rt) with right axillary lymph node metastasis (T2N1M0).

A Tumor board was held on 12th April 2021 and the recommendation was neoadjuvant Chemotherapy with Anti HER2. Then surgery with radiotherapy and finally anti HER2 with hormone therapy to be applied respectively.

USG Guided instillation of Ultra clip Marker was made in SOL of Right Breast on 25th April 2021. Ultra marker clip was instilled within lesion of right breast and she was advised for follow up mammogram on 26th April 2021 and 26th May 2021.

On the next day a follow up mammogram of right breast was done which showed hydrophilic marker within the lesion.(Fig-8)

Then chemo was started and another follow up mammogram was done 1 and half month after 3 cycle of neoadjuvant chemotherapy.

The impression was compared with previous film dated 18th April 2021 which showed significant reduction of size of lesion.(Fig-9). Patient then got total 12 cycles of chemotherapy from 26th April

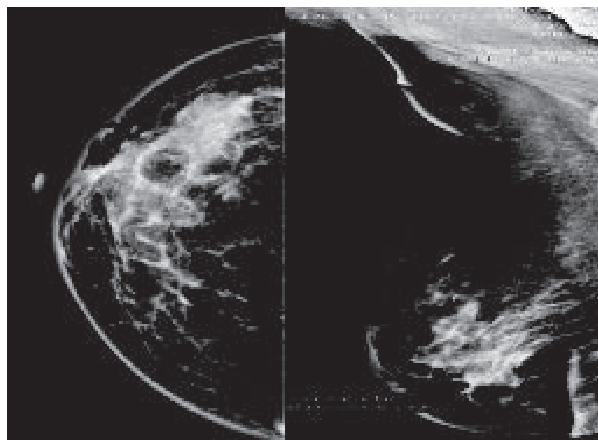

Fig 8: *Follow up mammogram of right breast was done on 26th April 2021*

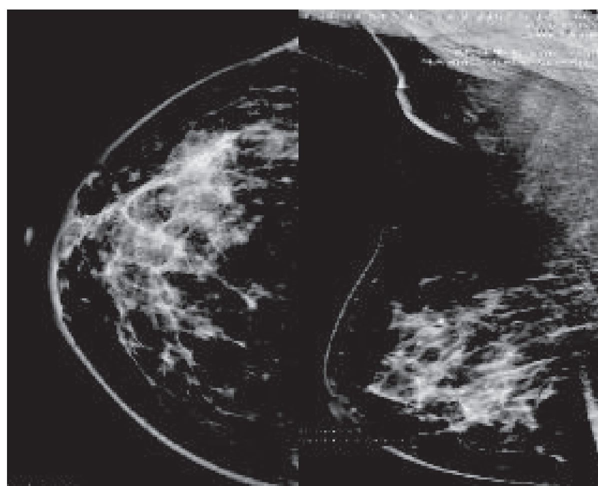

Fig.-9: *Follow up mammogram on 8th June 2021*

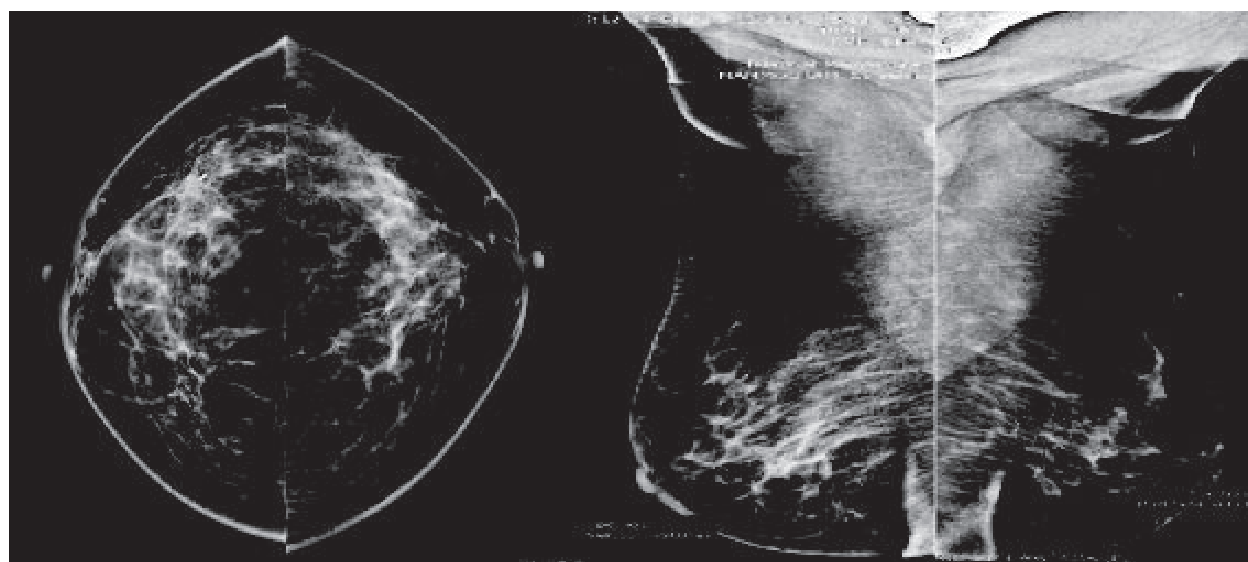

Fig.-10: *Follow up mammogram on 10th October 2021*

2021 to 21st September 2021. Three month later after completion of 12 cycles of chemotherapy another follow up mammo was done.

Compared with previous film dated 08th June 2021 showed significant regression of size of lesion. No definite mammographically visible mass lesion was seen.(Fig-10)

Spot image of mammograms CC and MLO view showed wire end was at centre of lesion near previously placed ultra clip.(Fig-11). Finally, surgical intervention was done on 26th October 2021 at 1300-1545 hours. After that a mammogram of excised specimen of right breast was done on same day.

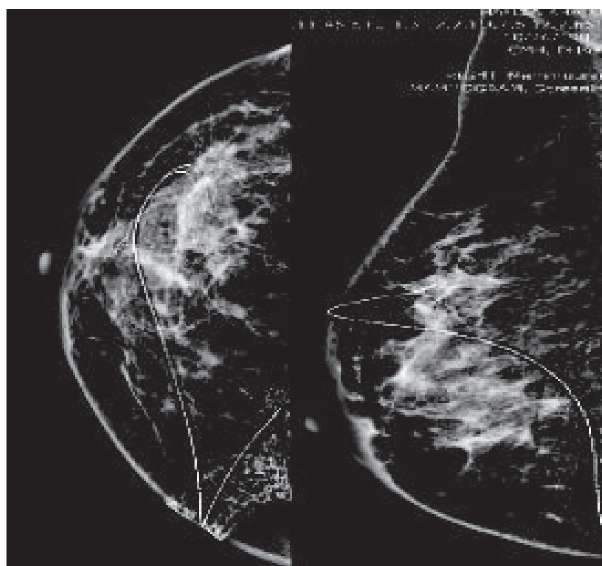

Fig.-11: *Mammogram of right breast was done on 26th October 2021*

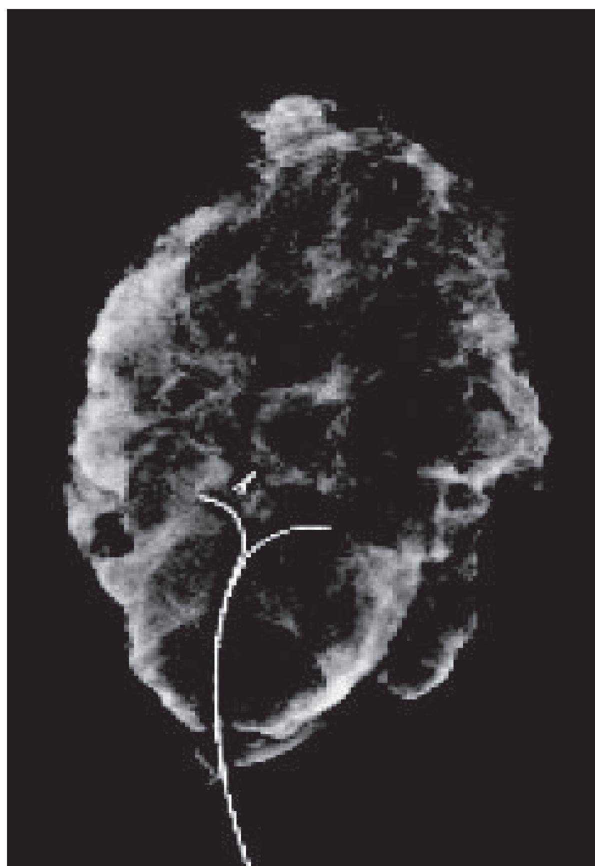

Fig 12: *Mammogram of the excised breast tissue specimen.*

Image showed excised margin is free and specimen was sent for histopathology.(Fig-12).Total twenty-seven cycles of three dimensional radiotherapies were given starting from 28th December 2021 up to 23rd January 2022 and now the patient is on hormone therapy.

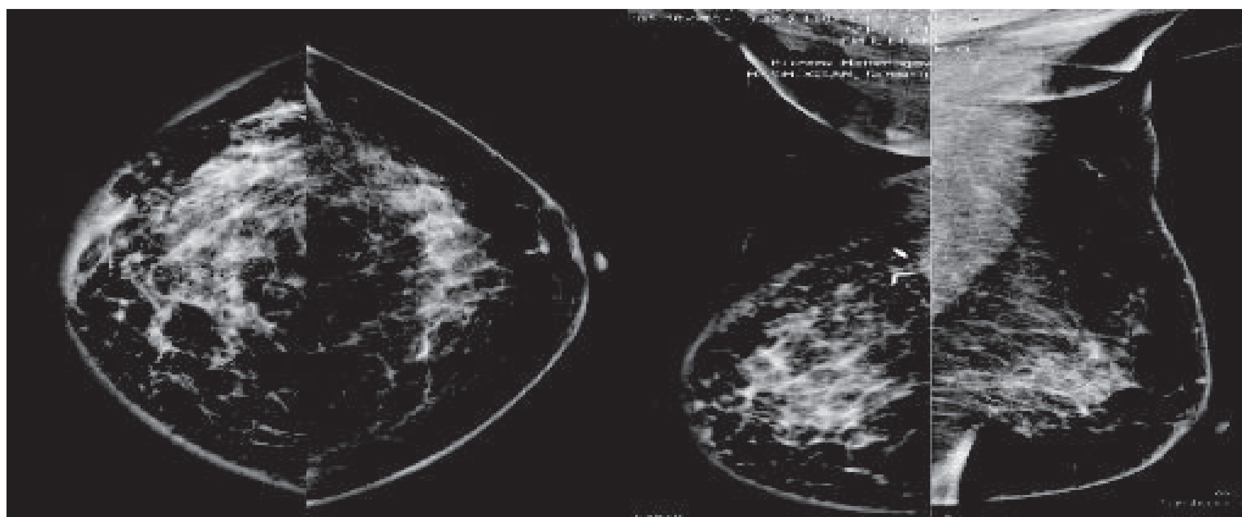

Fig 13: *Follow up mammogram on 16th May 2022.*

Almost 7 months after surgery another follow up mammogram of both breast was done. On 16th may 2022 which showed multiple radio opaque surgical clips in upper and outer quadrant of right breast. No definite mass lesion or architectural distortion was seen on either breasts.Skin was grossly thickened on right side, possibly due to sequel of operation and radiotherapy.(Fig-13)

Discussion:

In this study it has been seen that lesion was at first a small solid palpable lesion in right breast which after 2 month became a larger irregular shaped lesion with an additional enlarged right axillary lymph node . Mammogram showed an added density area in right breast with enlarged right axillary lymph node and was a suspicious case. Ultimately an USG guided biopsy confirmed it as an invasive ductal carcinoma with axillary lymph node metastasis. Few years back such silent case was used to be diagnosed at a late stage when it metastasizes to other organs and dealt with mastectomy followed by chemo and radiotherapy[3]. But now a days due to radiological advancement early diagnosis was possible but choice for lumpectomy with keeping breast fully intact is a cosmetic challenge[4]. The surgical plan was by placing a tissue marker making the lesion identifiable even after chemotherapy, but risk of recurrence would remain if primary was not removed[5]. An USG guided wire localization of tumor was needed as small cancerous breast tissue may not be differentiable in naked eye where a mammogram image can define density difference of healthy breast tissue[6]. The result of mammogram of excised breast tissue and frozen section biopsy was same[7]. This is different in a study conducted among 1064 breast cancer patient where mastectomy tool place among 56.9% and lumpectomy among 43.1% patient[8]. Mastectomy was chosen because of site of lesion, larger size, to avoid radiation related genetic mutation in later pregnancy, to avoid annual mammogram and MR. Again mastectomy ensure low morbidity and mortality. In large tumour with distant metastasis lumpectomy must not be chosen. To improve quality of life, physical, mental, social, emotional and cognitive functioning lumpectomy with radiotherapy could be an option. Again satisfaction rate in mastectomy varies depending on life expectancy and severity of disease. In less severe cases lumpectomy is more popular. But failure cases are also there. Overall survival rate of both mastectomy and conservative breast surgery is more or less same[9]. The case report was performed after taking informed written consent and willingness to participate from the patient without disclosing any personal data.

Conclusion:

Conservative Breast Surgery replaces difficulties of radical mastectomy and reduces mental trauma of patient and family. An awareness and periodic mammogram and periodic breast USG specially for premenopausal women can be a reliable radiological guideline as well as intervention radiological solution.

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