

The Role of Multimodality Images toward the Detection of Synchronous Breast Cancer (SBC) on a Woman with a Family History of Breast Cancer: A Case Report

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ABSTRACT

We present a case of a 47 year-old woman with a history of synchronous bilateral breast cancer with different radiology findings. This woman has a familial history as one of the primary risk factors. Breast imaging was performed on mammogram, breast ultrasound, and magnetic resonance. These modalities have their own advantages and disadvantages. Ultrasound guided core needle biopsy of left lesions that revealed invasive ductal cell carcinoma. In addition, stereotactic vacuum-assisted breast biopsy of the right breast microcalcification revealed malignant calcification and comedo necrosis. However, the signs of invasive ductal cell carcinoma were not obtained.

Keywords: breast cancer, synchronous, radiology.

ABSTRAK

Dilaporkan sebuah kasus wanita 47 tahun dengan riwayat kanker payudara bilateral sinkron. Didapatkan temuan radiologi yang berbeda. Riwayat keluarga dengan kanker payudara merupakan salah satu faktor risiko utama. Dilakukan pencitraan radiologi meliputi mamografi, ultrasonografi, dan resonansi magnetik. Masing-masing modalitas memiliki kelebihan dan kekurangan. Biopsi core dipandu ultrasonografi pada lesi payudara kiri menunjukkan adanya kanker payudara duktal invasif. Biopsi dengan bantuan vakum stereotaktik pada mikrokalsifikasi payudara kanan menunjukkan adanya kalsifikasi maligna dan nekrosis komedo. Meskipun demikian, tidak didapatkan adanya tanda-tanda kanker payudara intraduktal invasif.

Kata kunci: kanker payudara, sinkron, radiologi

INTRODUCTION

A 47 year old premenopausal woman with family history of breast cancer was presented with a breast lumps in her left breast in October 2010. On the examination, a 4 cm-discrete lump was palpable in the upper quadrant of her left breast and a 3 cm-lump in the axillary tail felt in the left breast. There is no palpable lesion in the right breast. Mammography examination was performed and a high-density oval mass with partial obscured margin was found on her superior left breast and a segmental fine pleomorphic microcalcification was found on her right breast. It was suggestive of bilateral breast cancer. Ultrasound examination on left breast showed a lobulated solid lesion with heterogeneous internal echo. Ultrasound guided core needle biopsy was performed on her left breast and revealed as an invasive ductal carcinoma, atypia 3, ER (+), PR (-), Her 2 (+). The ultrasound of her right

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breast found some unspecific hypoechoic lesion that was revealed as a mastopathia pattern. Ultrasound guided core needle biopsy was performed also with conclusion of suggestive ductal carcinoma in situ (DCIS). In addition, MRI was done with the result of suggestive of invasive ductal cell carcinoma on the left breast with axillar metastase and suggestive DCIS on the left breast without axillar lymphadenopathy.

Based on breast imaging founding, stereotactic vacuum assisted biopsy was done and continued with wire needle localization (Fig. Pathologic founding of these biopsy features are suggestive of malignant calcification and comedo necrosis while the signs of invasive ductal cell carcinoma were not be obtained, ER (+), PR (+), and Her 2 (-). Her left breast disease was T2N1M0, stage II B and the right breast was TisN0M0, Stage 0. Other systemic examinations did not reveal any relevant thing. Routine blood test showed Hb 8.7 g/dl, total and differential count of WBC, liver function test, renal function test, and ALP within normal limit. High estradiol was 110.3, high CA was 15-3; 39 U/ml, and anti p53 was 1760 U/ml. CT of the lung and whole abdomen revealed normal study. Bone scintigraphy was normal and there is no evidence of metastases.

This patient has different stage and different hormonal status on her two sites of malignancy. Management of this SBC patient was based on her index tumor. First, she will receive chemotherapy. The first 4 cycles of chemotherapy were FEC (Inj.5 FU+Inj. Epirubicin + Inj. Cyclophosphamide) x 3 weekly cycles and continuous with inj paclitaxel 80 mg, inj trastuzumab. After a six-month evaluation, response therapy will be based on surgical therapy. The hormonal therapy that will be given depends on her menstrual status after chemotherapy.

DISCUSSION

Synchronous Breast Cancer (SBC) is described as a malignancy that involves the development of a second malignant tumor within three months of the development of the first tumor. For some women, the development of SBC may be a sign of metastasis, while for other women this complication may simply be the development of an independent and new case of breast. The overall incidence of bilateral breast cancer has been shown to range from 1.4% to 12%.^{1,2} Kim, et al. defined the index cancer as the mass that was initially detected or reported by a patient, and contralateral cancer was defined as the mass that was detected in the contralateral

breast during breast evaluation.³ The incidence of bilateral synchronous breast cancer is uncommon, ranging from 0.7% to 3.0% in recent reports.^{1,2} One of the primary risk factors involves a familial history of this type of complex malignancy. These occur in this patient whose grandmother had a history of breast cancer. In addition, the women over the age of 58 years often are placed at a greater risk for SBC. The age of menopause onset does not seem to influence the progression of synchronous breast cancer. However, histology reports on first tumor represent a rather aggressive grading. This may also be a risk factor in the development of synchronous breast cancer.³

Patients with bilateral synchronous breast cancer have worse survival rates because of distant metastasis. Detection of bilateral synchronous breast cancer on imaging has been associated with earlier stage on diagnosis and better survival than the index cancer. These findings reinforce the need for early detection of non-symptomatic contralateral breast cancer in patients at the time of the initial diagnosis of unilateral breast cancer.⁴

Multi-modality imaging are complementary useful to detect SBC. They have their own advantages and disadvantages. Mammography as primary tool for breast cancer screening is extremely sensitive in detecting micro calcifications.⁵ Right breast mammography have conspicuous calcifications, the fine pleomorphic calcifications with a segmental distribution, even without the presence of the mass these calcifications would be classified as BI-RADS 5 (Fig. 1A,B; Fig. 2). Other type, fine linear calcifications, based on the morphology and distribution these calcifications, was also classified as BI-RADS 5.⁵ However, mammography is inadequate for detecting breast lesion in women with extremely breast dense. In this case, the woman has BI-RADS density type III, heterogeneously dense (40-90%).⁶

Ultrasound is an image with many appropriate indications. Based on The American College of Radiology Practice Guideline, the appropriate indications for breast ultrasound included in this case are evaluation and characterization of palpable masses and other breast related signs and/or symptoms, evaluation of breasts with micro calcifications, malignancy or highly suggestive of malignancy in a setting of dense fibro glandular tissue, for detection of an underlying mass that may be obscured on the mammogram, and guidance of breast biopsy and other interventional procedures.⁷ Ultrasonography examination on left breast showed

a 3.7 x 2.5 cm solid lobulated mass with heterogenous internal echo (Fig. 3A,B) proving to be malignant.⁸ Abnormal lymph adenopathy without hilar fat pattern was also defined (Fig. 4A,B). It was suggestive of nodal metastases. Ultrasound is the modality of choice for characterizing and guiding biopsy of these lesions. Ultrasound guided biopsy was performed

on her left breast and revealed as an invasive ductal carcinoma. Ultrasound of her right breast found an unclear lesion and some hypoechoic lesion as a mastopathia pattern with normal axillar lymph node (Fig. 5A,B). Ultrasound biopsy was performed with inconclusive result and suggestive ductal carcinoma in situ (DCIS).

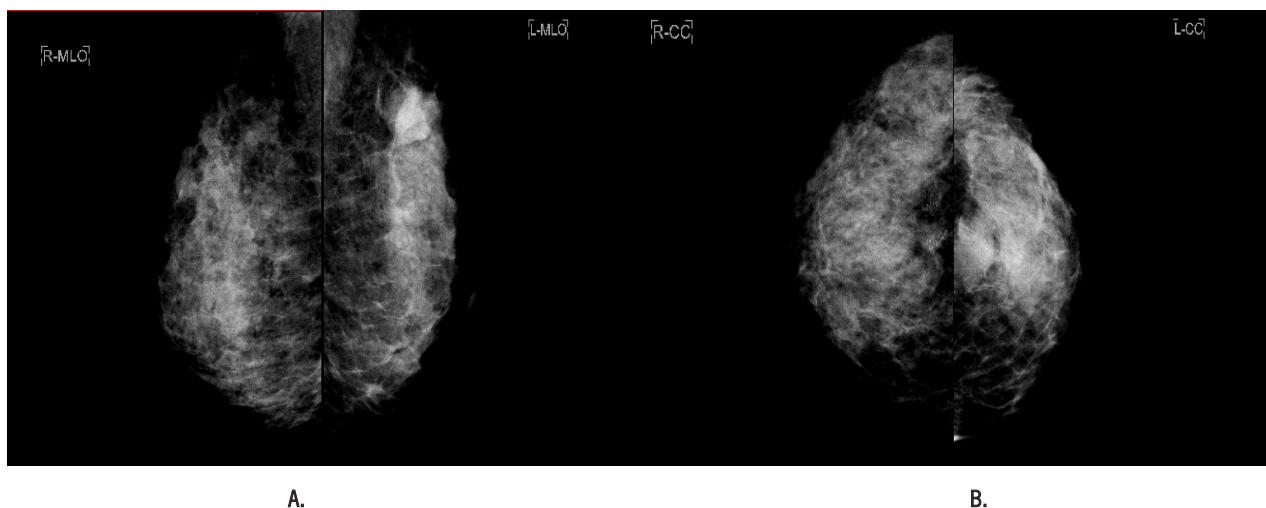


Figure 1:
MLO views (A) and CC views (B). Fine pleomorphic segmental microcalcification on the right breast (arrow) and indistinct mass on left breast (arrow head) suggestion of synchronous breast cancer (SBC)

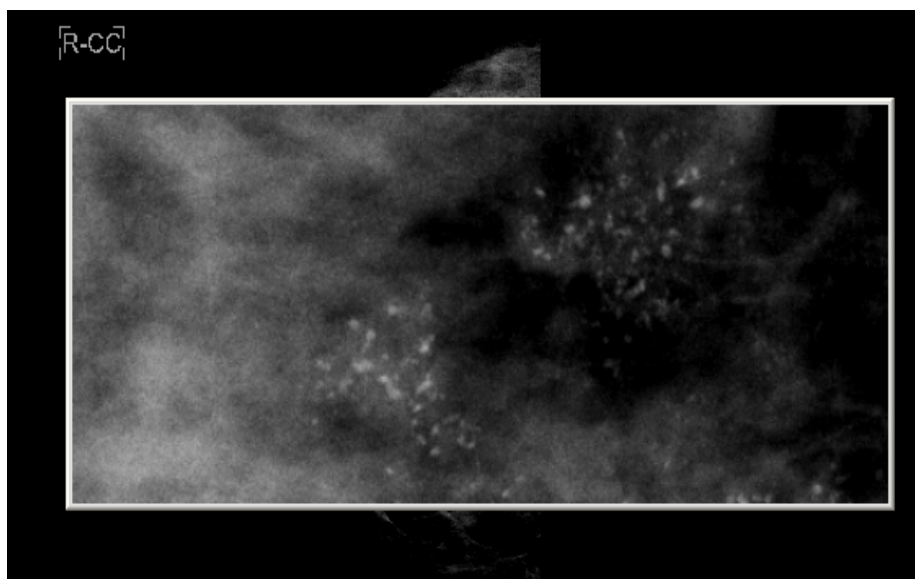
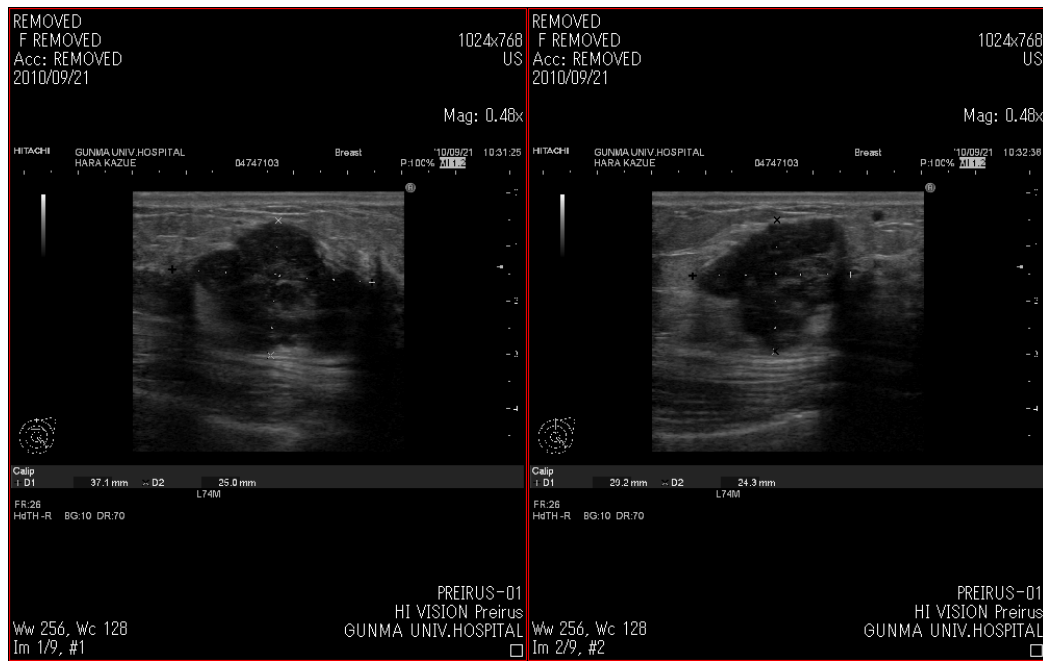


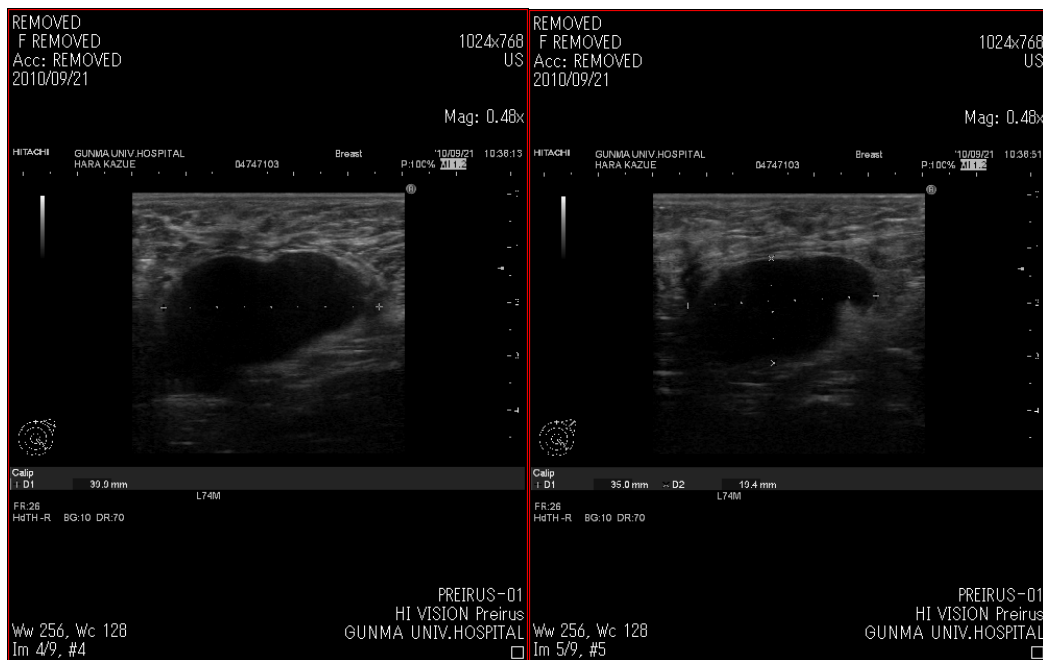
Figure 2:
Magnification imaging on right breast. The most conspicuous calcifications however are the fine pleomorphic calcification. They have a segmental distribution. Even without the presence of the mass these calcification should be classified as BI-RADS 5



A.

B.

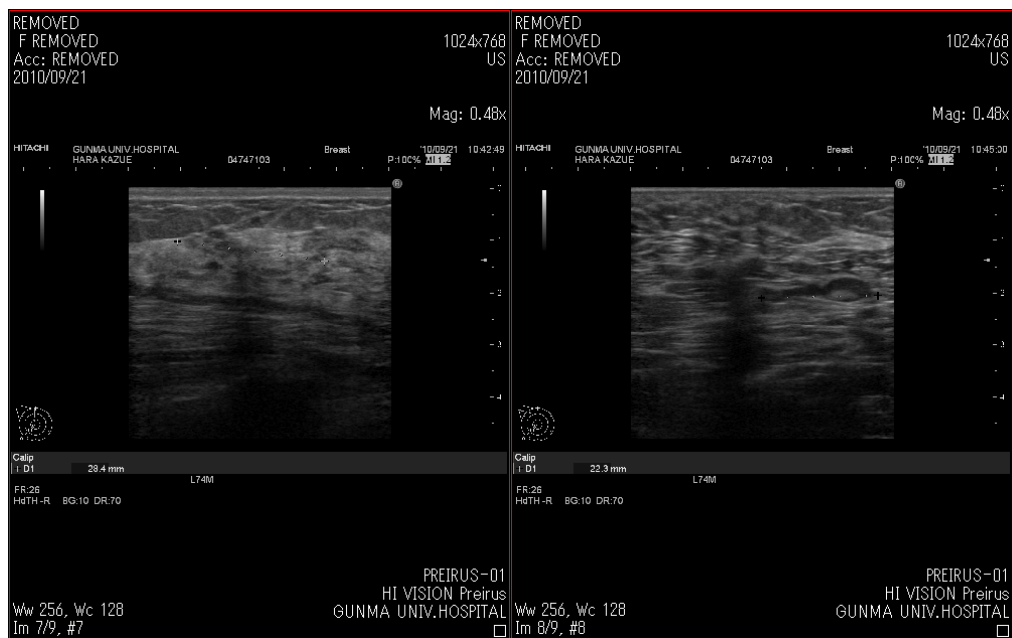
Figure 3:
Two sectional ultrasonography of the left breast (A,B).
Lobulated Solid Masses with heterogeneous internal echo proving to be malignant.



A.

B.

Figure 4:
Two sectional ultrasonography (A,B).
Abnormal lymph adenopathy without hilar fat pattern also defined, it was suggestive of nodal metastases

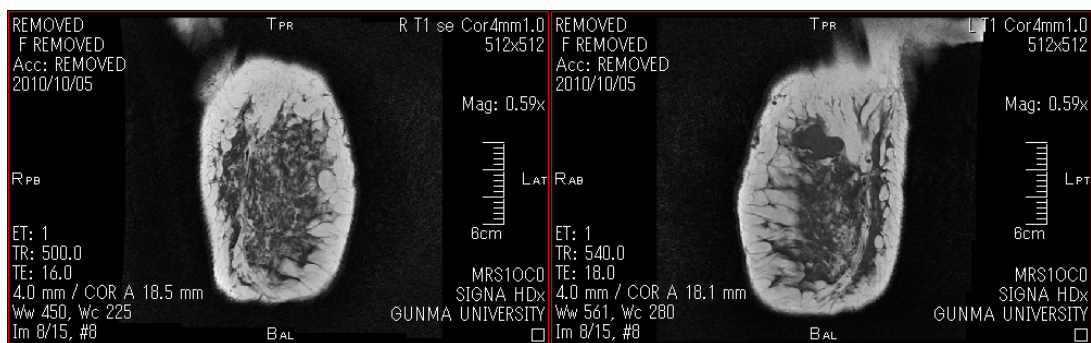


A.

B.

Figure 5:

Ultrasonography of her right breast found an unclear lesion. Some hypoechoic lesion was found as a mastopathy pattern (A) with normal axillar lymph node (B). Ultrasound biopsy was performed with inconclusive result and suggestive ductal carcinoma in situ (DCIS)

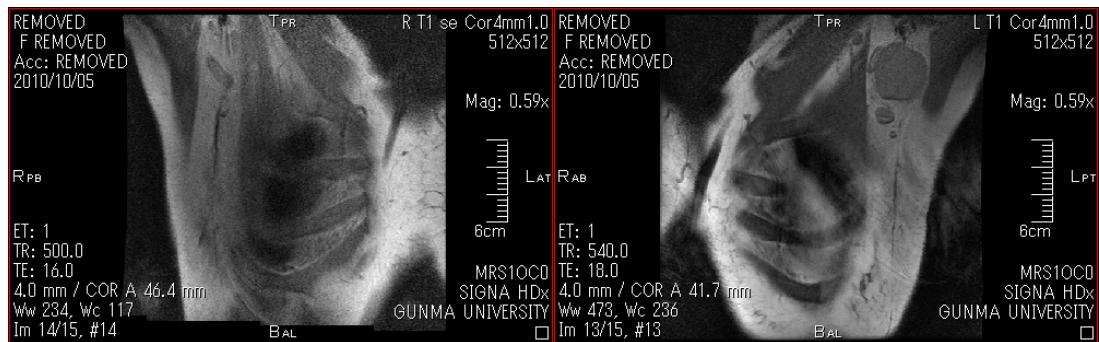


A.

B.

Figure 6:

T1 Weighted Image MRI with fat suppression, there is no suspicious lesion on the right breast (A) and showed hypointense lesion on the left breast (B)



A.

B.

Figure 7:

T1 Weighted Image MRI with fat suppression showed normal right axillar lymph node (A) and hipo intense left axillar lymph adenopathy (B)

T1 Weighted Image MRI with fat suppression showed there is no suspicious lesion on the right breast (Fig. 6A) with normal right axillar lymph node (Fig. 7A) and showed hypointense lesion on the left breast (Fig. 6B) with hypointense left axillar lymph adenopathy (Fig. 7B). T2 Weighted Image MRI, showed multiple small hyperintense lesions on segmental area on the right breast (Fig. 8A) with normal right axillar lymph node (Fig. 9A). There are lobulated hyperintense lesion on the left breast (Fig. 8B) and hyperintense left axillar lymph adenopathy (Fig. 9B).

Post gadolinium injection showed multiple small inhomogen slight enhancements on segmental area from the nipple to the superior segment right breast with normal axillar lymph node (Fig. 10A,B). Lobulated inhomogen enhancement lesion showed on the left breast with axillar lymph adenopathy (Fig. 11A,B) Three Dimensional (3D) was reconstruction with the conclusion suggestive DCIS on the right breast without axillar lymph adenopathy (Fig. 12A) and suggestive of invasive ductal cell carcinoma on the left breast with axillar metastase (Fig. 12.B).

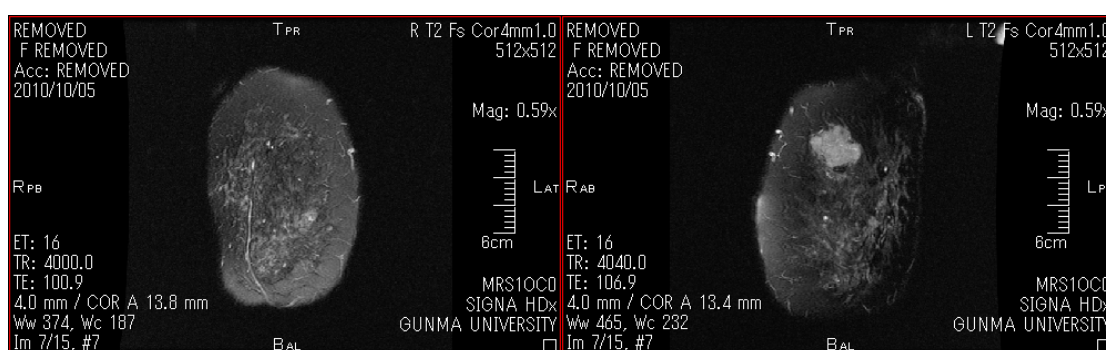


Figure 8:

T2. Weighted Image MRI, showed multiple small hyperintense lesions on segmental area (A) and lobulated hyperintense lesion on the left breast (B)

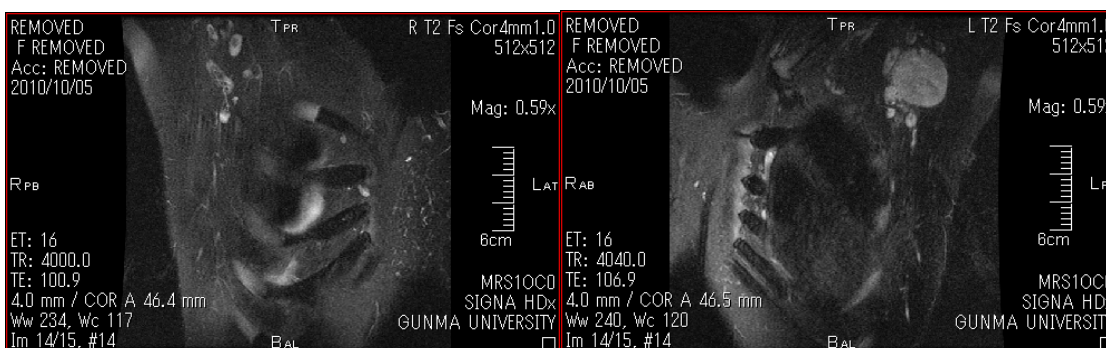


Figure 9:

T2. Weighted Image MRI showed normal right axillar lymph node (A) and hyper intense left axillar lymph adenopathy (B)

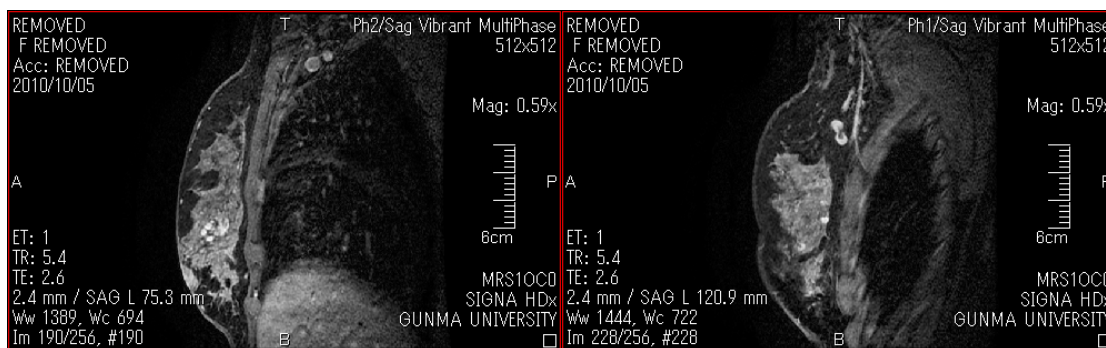


Figure 10:

Post inj gadolinium showed multiple small inhomogen slight enhancements on segmental area from the nipple to the superior segment right breast (A) with normal axillar lymph node B)

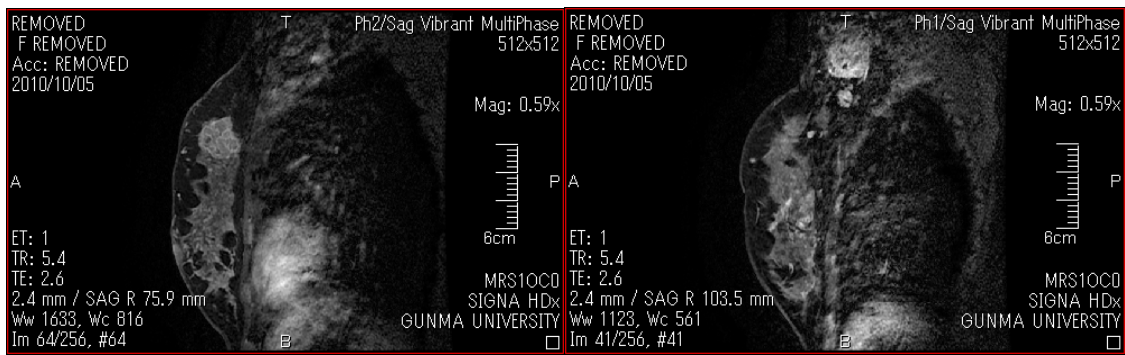


Figure 11: Post inj gadolinium. MRI showed lobulated inhomogeneous enhancement lesion on the left breast (A) and axillary lymphadenopathy (B)

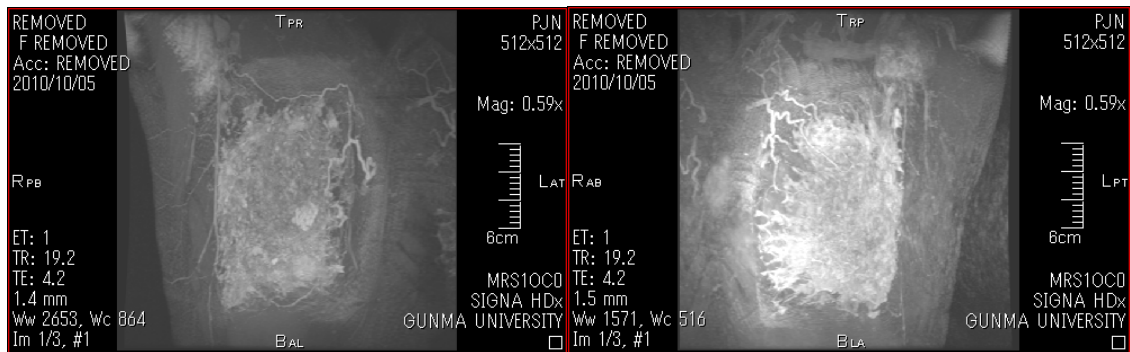


Figure 12: 3D was the reconstruction with the conclusion suggestive DCIS on the right breast without axillary lymphadenopathy (A) and suggestive of invasive ductal cell carcinoma on the left breast with axillary metastase (B).

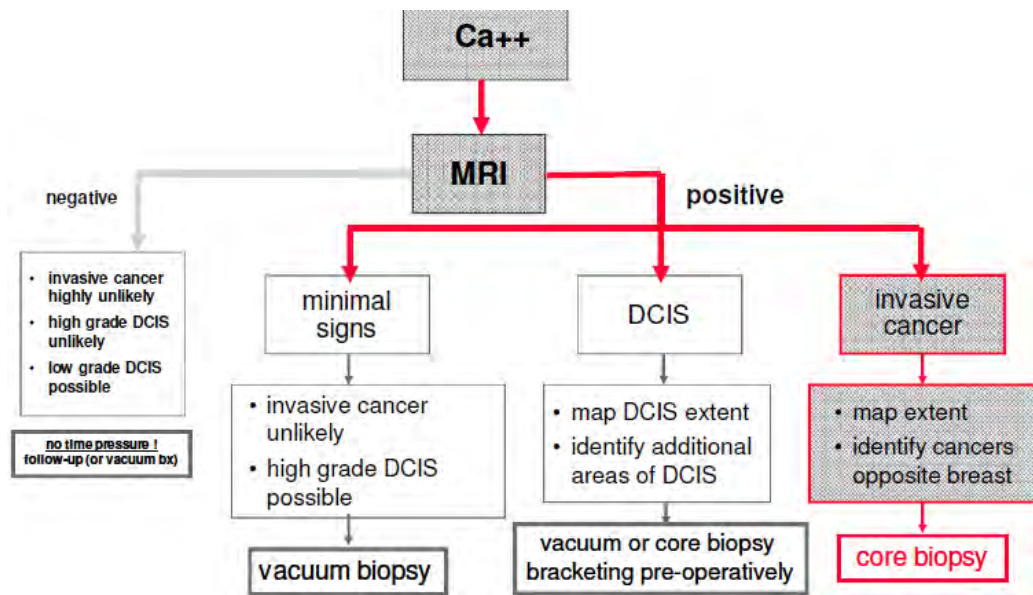


Figure 13: MRI Triage patient with mammographic calcification¹⁰

Over the past few years, it has become increasingly clear that MR imaging has played a significant role in the diagnosis of DCIS. MRI improved mapping of DCIS extent and of intraductal components around invasive cancers to avoid re-excisions to obtain free margins, allow the diagnosis of DCIS that went undetected by mammography, improve the triage of patients with calcifications to increase PPV of mammographic vacuum biopsy (Fig. 13), to avoid diagnostic delays in prognostically significant lesions (high grade DCIS, invasive cancer), and to reduce anxieties in patients.⁹

Contralateral tumor of this patient has different appearance to the index tumor as Roubidoux report.¹⁰ Evaluation of a contralateral imaging should be performed without regard for the image findings of the first cancer.

MRI resulted on minimal sign on right breast calcification suggestive of DCIS. There is no sign of invasive ductal carcinoma and stereotactic vacuum

assisted biopsy that was performed (Fig. 14). Pathological finding on this biopsy was malignant calcification and comedo necrosis without invasive ductal carcinoma.

The best management of patients with bilateral breast cancer is still not known. Patients are often treated with bilateral mastectomy rather than breast-conserving treatment and the prognosis is also regarded worse than in the case of unilateral breast cancer. This patient has different type, stage, and hormonal status, while the management was based on her index tumor. Contralateral cancers tended to be smaller and to have DCIS in a higher percentage of the cases than the index cancer.

Patients with SBC have a higher rate of distant metastasis and a worse disease specific survival than those with unilateral breast cancer. In this case CT of the lung (Fig. 15A) and abdomen (Fig. 15B), bone scintigraphy (Fig 16.C) finding were normal. There is no incidence of metastases.

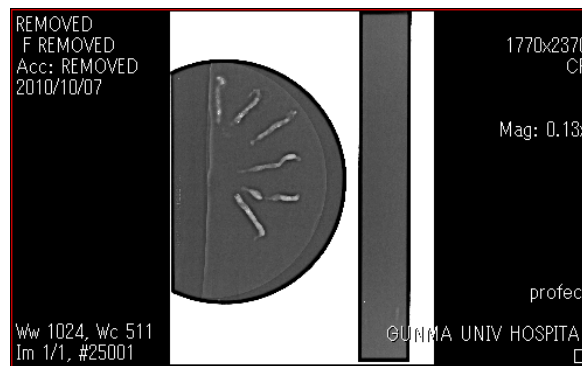


Figure 14: Sample stereotactic vacuum assisted biopsy. Pathologic founding of these biopsy features are suggestive of malignant calcification, comedo necrosis, not be obtained signs of invasive ductal cell carcinoma, ER (+), PR (+) and Her 2 (-).

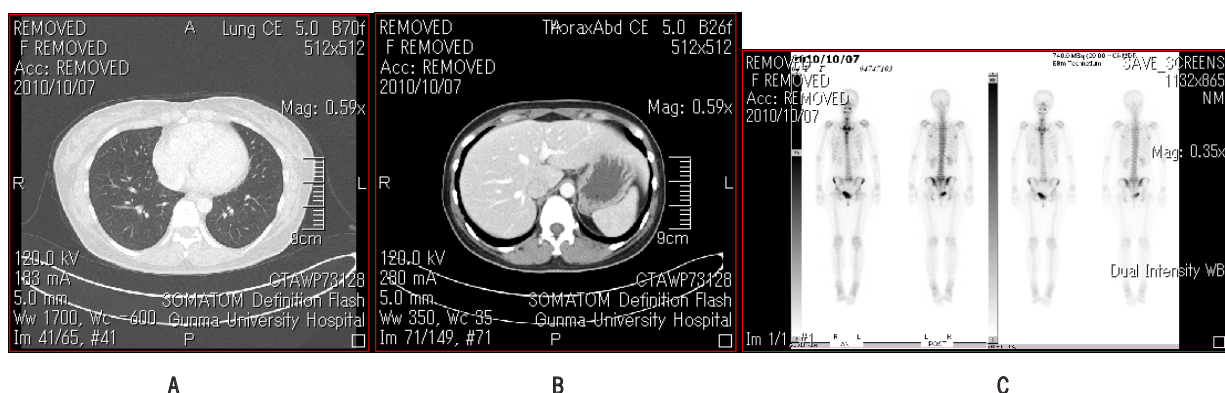


Fig. 11: These images show thorax (A) and abdominal (B) CT and Bone scitigraphy (C) on normal limit. There is no evidence of metastases.

CONCLUSION

Additional contralateral breast cancers in bilateral synchronous breast cancers appeared is usually small and less palpable and have less suspicious imaging findings and less advanced cancer staging than the index cancer. Multimodality imaging such as mammography, whole-breast ultrasound, and magnetic resonance are useful in the early detection of contralateral synchronous breast cancer.

REFERENCES

1. Heron DE, Komamicky LT, Hyslop T, Schwartz GF, Mansfield CM. Bilateral breast carcinoma: risk factors and outcomes for patients with synchronous and metachronous disease. *Cancer* 2000; 88:2739 -2750
2. Khairi GA, Guraya SG, Ahmed ME, Ahmed MA... Bilateral Breast Cancer Incidency Diagnosis and Histological Pattern. *Saudi Med J* 2005;26-4:6
3. Kim MJ, Kim EK, Kwak JY, Park BW, Kim SL, Oh KK. Bilateral Synchronous Breast Cancer in an Asian Population: Mammographic and Sonographic Characteristics, Detection Methods, and Staging *AJR* 2008; 190:208-213
4. Smithuis R, Pijnappel R. Breast Calcifications - Differential diagnosis and BIRADS *Journal of Clinical Pathology* 2008;61:145-151
5. Balleyguier C, Ayadi S, Van Nguyen K, Vanel D, Dromain C, Sigal R. BIRADS classification in mammography. *Jur. Eur. Radiology* 2007 Feb;61(2):192-4.
6. Kim MJ, Kim EK, Kwak JY, Park BW, Kim SL, Oh KK. Clinical Application of the BI-RADS Final Assessment to Breast Sonography in Conjunction with Mammography. *AJR* 2008; 190:1209-1215
7. Berg WA, Campassi CI, Ioffe OB. Cystic Lesions of the Breast: Sonographic-Pathologic Correlation. *Radiology* 2003; 227 183-191.
8. Kuhl CK. Why Do Purely Intraductal Cancers Enhance on Breast MR Images? *Radiology* 2009; 253; 281-283.
9. Kuhl CK. Diagnosing Intraductal Cancer (DCIS with MRI). www.worldclassme.com.
10. Roubidoux MA, Lai NE, Paramagul C, Joynt LK, Helvie MA. Mammographic appearance of cancer in the opposite breast: comparison with the first cancer. *AJR* 1996;166 : 29-31