Practicing Breast Imaging in HRT Ladies in Thailand

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The incidence of breast cancer in Thai women increased significantly each year. The statistic from Siriraj Cancer Institute, it was 6.8% of female cancers in 1985 and became 20.0% in 2003. With increasingly use of hormone replacement therapy in Thai ladies, awareness of breast cancer is mandatory. Screening for breast cancer is recommended prior to and during the treatment.

Thai breasts are differed in the composition of breast tissue. It was almost entirely fat in 2527 cases (7%), scattered fibroglandular in 7216 cases (20%), heterogeneously dense in 21498 (59%) and extremely dense in 5146 cases (14%).Therefore, in our practice, no matter it is a screening or diagnostic case, we performed mammography first, we looked at the films and finished the

Siriraj Breast Centre had mammograms performed in 39,806 cases (up to July 2004), which was for screening in 22,468 cases (56.44%) and for diagnosis in 17338 cases (43.56%). Of the screening cases, we made diagnosis of benign looking lesions (BIRADS 2) in 24.35%, probably benign (BIRADS 3) in 17.02%, indeterminate lesion (BIRADS 4) in 2.23% and malignancy (BIRADS 5) in 79 cases (0.35%).

Of those 79 cases, mass was noted in 43 cases, microcalcifications alone in 19 cases and mass with microcalcifications in 22 cases.

The ultrasound can detect malignancy in mammography negative in 141 cases. The correlation of mammographic, ultrasonic and pathological diagnoses will be presented and the analysis confirms significantly increased accuracy when both mammograms and ultrasound are practiced together, mammographic study and then, we scanned the patient by ultrasound. When a mass is found by mammograms, it is defined into a round or oval mass or a microlobulated, irregular or speculated mass. Ultrasound can show more details of the mass. We give the impression of a simple cyst, complex cyst, benign looking solid mass, probably benign solid mass, indeterminate nature or highly suggestive of malignancy. Ultrasound is very beneficial in detection of the vascularity of the mass and guidance for breast intervention (core needle biopsy, fine needle aspiration, cyst aspiration and needle localization, etc.) The procedure is easy and quick, showing the exact needle tip at real-time.

When microcalcifications are presented, mammography is extremely valuable. The distribution and the individual character of microcalcifications can be determined, leading to accurate diagnosis. Ultrasound is almost no clinically useful, unless they are abundant and extremely high frequency, high- resolution transducer is available. In certain cases, we use US guidance in such lesions, but normally, we use stereotactic guidance.

Other findings are also beneficial and will be discussed.

Keywords: *Breast, HRT*

J Med Assoc Thai 2004; 87(Suppl 3): S169-73

The incidence of breast cancer in Thai women increased significantly each year. The statistic from Siriraj Cancer Institute, it was 6.8% of female cancers in 1985 and became 20.0% in 2003 (Table 1). With increasingly use of hormone replacement therapy in Thai ladies, awareness of breast cancer is mandatory. Screening for breast cancer is recommended prior to and during the treatment.

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Thai breasts are differed in the composition of breast tissue. It was almost entirely fat in 7%,

scattered fibroglandular densities that could obscure a lesion in 20%, heterogeneously dense breast tissue that may lower the sensitivity of mammography in 59% and extremely dense breast tissue that lowers the sensitivity of mammography in 14% (Table 2). It is hard to see &/or evaluate the lesion in the latter two types of breast tissue, which is around 73% of Thai mammography. Therefore, in our practice, no matter it is a screening or diagnostic case, we performed mammography first, we looked at the films and finished the mammographic study and then, we scanned the patient by ultrasound. We take this opportunity to be with the patient in the US room to take history, do the physical breast examination and advise and teach the patient how to perform breast self examination.

Siriraj Breast Centre had mammograms performed in 39806 cases (up to July 2004), which was for screening in 22,468 cases (56.44%) and for diagnosis in 17338 cases (43.56%). Of the screening cases, we made diagnosis of benign looking lesions (BIRADS 2) in 24.35%, probably benign (BIRADS 3) in 17.02%, indeterminate lesion (BIRADS 4) in 2.23% and malignancy (BIRADS 5) in 79 cases (0.35%), see Table 3. Among the biopsy proven 84 malignancies, mass was noted in 43 cases, microcalcifications alone in 19 cases and mass with microcalcifications in 22 cases. Of the diagnostic mammography performed in clinically breast complaint, BIRADS 2 was found in 7136 cases (41.16%), BIRADS 3 in 6900 (39.80%), BIRADS 4 in 1968 (11.35%) and BIRADS 5 in 1334 cases (7.69%), see Table 4. Among the biopsy proven 1,761 malignancies, mass was noted in 106 cases, microcalcifications alone in 19 cases and mass with microcalcifications in 531 cases.

The ultrasound can detect malignancy in mammography negative in 141 cases. The correlation of ultrasonic, mammographic and pathological diagnoses is presented in Table 5-7. The analysis confirms significantly increased accuracy when both mammograms and ultrasound are practiced together.

Our management of breast lesions is as follow:

1. Mass:

If a mass is found on mammography, palpable or not, its shape is defined into:

1.1. Round, or oval shaped mass on mammography: Colour Doppler ultrasound is performed for further characterization into cystic or solid lesion.

1.1.1. If a cyst is noted. The lesion should be further classified by ultrasound criteria as follow:

1.1.1.1. The ultrasound criteria of a simple cyst is a smooth well defined thin walled, clear fluid

Table 1. Common female malignancies: Siriraj Cancer Institute, 2003

Site	Cases	%
Uterine cervix	618	22.66
Breast	545	19.99
Colorectal	164	6.01
Lymphoma	151	5.54
Leukemia	148	5.43
Ovary	111	4.07
Uterine corpus	92	3.37
Lung	91	3.34
Thyroid	83	3.04
Skin	74	2.71
Total	2,727	100.00

Table 2. Types of fibroglandular breast densities in Thai women: Siriraj Breast Centre, 2004

Breast tissue	Cases	%
Almost entirely fat	2,527	7
Scattered fibroglandular	7,216	20
Heterogeneously dense	21,498	59
Extremely dense	5,149	14

Table 3. Compare diagnosis in screening and diagnostic mammography

Mammogram	Screening mammo.		Diagnostic mammo.	
BIRADS	Cases	%	Cases	%
2 : Benign looking	5,471	24.35	7,136	41.16
3 : Probably benign	3,824	17.02	6,900	39.80
4 : Suspicious abnormality	500	2.23	1,968	11.35
5 : Highly suggestive of malignancy	79	0.35	1,334	7.69
Total	22,468		17,338	

Table 4. Compare findings in malignancy seen by screening and diagnostic mammography

Findings	Screening mammo.		Diagnostic mammo.	
	Cases	%	Cases	%
Mass alone	43	51.19	1,124	63.82
Calcifications alone	19	22.62	106	6.02
Mass with calcifications	22	26.19	531	30.16
Total	84		1,761	

Table 5. Correlation of ultrasound with pathology and mammography findings. (Wilaiporn Bhothisuwan, HRH Breast Centre, Faculty of Medicine Siriraj Hospital, Mahidol University)

US diagnosis	Pathological results			Mammographic results			
	Benign	Malignant	Negative	Benign	Indeterm.	Malignant	B + I
Negative	6			4		2	4
7		1				1	
Benign	127		13	79	18	17	97
136		9	3	4	2		6
Malignant	26		2	8	5	11	13
136		110	7	7	6	90	13
Total # 279	159	120	25	102	31	121	133

Table 6. Correlation of mammography with pathology and ultrasound findings (Wilaiporn Bhothisuwan, HRH Breast Centre, Faculty of Medicine Siriraj Hospital, Mahidol University)

Mam. diagnosis	Pathological results		Ultrasound results		
	Benign	Malignant	Negative	Benign	Malignant
Negative	15		4	13	2
25		10		3	7
Benign	91		0	79	8
102		11		4	7
Indeterminate	23		2	18	5
31		8		2	6
Malignant	30		1	17	11
121		91		0	90
Total # 279	159	120	7	136	136

Table 7. Results of combination of mammography and ultrasound in diagnosis of breast lesions (Wilaiporn Bhothisuwan, HRH Breast Centre, Faculty of Medicine Siriraj Hospital, Mahidol University)

Mammo & US diagnosis (Modified BIRADS)	Benign		Malignant		Total cases
	case	%	case	%	
cat 2	94	94.90	5	5.10	99
cat 3	31	88.57	4	11.43	35
cat 4	23	53.49	20	46.51	43
cat 5	4	4.22	91	95.78	95
Total	152		120		272

containing cyst, no architectural disruption, tissue reaction, abnormal vessel. There is no need for other management, except:

- The patient insists on having it aspirated or removed
- There is local tenderness but the mass is not palpable
- There is palpable lesion but it needs document evaluation
- Residual fluid is present.

Ultrasound guided aspiration is most suggestive. The patient can be returned to normal screening schedule.

1.1.1.2. The ultrasound criteria of a complex cyst includes thick septation, thicken-convex inner walls, abnormal vessels at the wall. Ultrasound guided aspiration of fluid and FNA by 18-G needle at the suspected wall/area is recommended. The fluid and cells are sent for cytology. If the cyst cannot be completely aspirated, a 14-G core needle biopsy for pathology may be added.

1.1.2. If a solid mass is noted by ultrasound, the criteria of ultrasound classification with modified BI-RAD categories are as follow :

1.1.2.1. The ultrasound criteria for benign looking solid mass include:

- Smooth, well-marginated solid mass of hypoechogenicity
- With minimal or no lobulation

Regardless of size, 80-90% are benign. FNA &/or CNB (preferred by ultrasound guided) is recommended. If the result is benign, no surgery or excision is needed, except if insisted upon by the patient. If the result is malignancy, then surgery or appropriate treatment is prompt. This will cut delayed follow up and patient's anxiety.

1.1.2.2. The ultrasound criteria for indeterminate solid mass include:

- Partial loss margination
- Increased lobulation

20-40% of these masses are malignant, thus require biopsy (FNA/CNB). The planning for surgery or other management depends on the pathological result. This should reduce re-excision and period of worry.

1.1.3. The ultrasound criteria for non-palpable probably benign solid lesions include:

-Generalized or localized breast abnormality
-A solitary noncalcified, well defined solid nodule

20% of the follow up yields positive predictive value of 2%. But the lesion is not palpable, thus breast examination and follow up are more difficult, therefore, any non-palpable lesions require histology. Needle localization for surgery is essential.

1.2 Irregular or speculated mass on mammography and there was no previous trauma or infection over the area, 75-85% are malignant.

The differential diagnoses are fat necrosis, radial scars, sclerosing adenosis, granular cell tumour and papillomatosis. It needs pathological confirmation and excision.

Ultrasound and US guided CNB is recommended. The alternative, if available, is the digital stereotactic CNB, which is preferred to the conventional stereotactic CNB. Stereotactic guidance is advised in a deep lesion in large fatty replaced breast, while ultrasound guidance is preferred in a superficial lesion in small breast and a lesion very close to the chest wall.

2. Microcalcifications:

Microcalcifications found in mammography are always worrisome. It is very important to understand that microcalcifications may be the only finding in making a diagnosis of breast cancer, particularly a DCIS (ductal carcinoma in situ), a disease that is curable. It is found only by mammography, not by normal transducer ultrasound, MRI, RNS or physical examination. Thus, mammography is still the imaging of choice in breast cancer screening.

3. Other findings:

3.1 Architectural distortion is tethering of the glandular tissue with the production of radiating, fine spicules unassociated with the mass, which is often a feature of malignancy. Appropriate action should be taken.

3.2 Breast asymmetry is the presence of glandular tissue in one part of the breast not in a similar location in the contra lateral breast and is often a normal finding. If it is not associated with a palpable mass or malignant mammographic features, the patient requires only a screening programme, not a follow-up programme.

3.3 Focal asymmetry is glandular tissue without the properties of a true mass but with a similar appearance on both CC and MLO views. Although it may merely represent an asymmetrical focus of glandular tissue, a further work-up with a spot cone compression view or ultrasound may be warranted.

In summary, the management of breast lesion depends on the characteristic of the imaging findings. BIRADS 4 and 5 need pathological study of any forms, while BIRADS 3 requires closed follow-ups.

There are many ways to obtain specific pathological studies. Among those included are: core needle biopsy (CNB), fine needle aspiration (FNA), excisional biopsy and other forms of surgical removal. Newer techniques using ABBI system and mammotome must be considered with a lot of precaution. If the lesion is not palpable and needed surgery, needle localization is appropriate. Any lesions that are seen by US, US guidance is recommended. The lesions that are seen only in mammograms, stereotactic guidance is required.

In conclusion, breast imaging findings management in the diagnostic radiological department guidelines is:

1. Add further studies if the imaging does not provide adequate information
2. Follow up if the lesions look benign and
3. Perform pathological study of any kinds if the lesion is indeterminate or malignancy is suspicious.

Plan of further treatment depends on the result of the pathology, as well as other factors, including tumour staging, histological grading, patient's status and preference, underlying risk factors, hormone receptors in tumour, genotype of the patient, etc.

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