EARLY DETECTION OF BREAST CANCER BY SCREENING MAMMOGRAPHY

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ABSTRACT

Mammography is currently the best modality for breast cancer screening. We have been performing a mammography screening over the last 3½ years on 1000 women seen during this period. We detected 3 cancers, all of which were ductal carcinoma-in-situ with microinvasion and no axillary node involvement. The overall cancer detection rate was three per thousand. All of our cases were younger than 49 years of age. Our cancer detection rate and stage of detected cancer meet the standard suggested by international reports. Further study to increase our sample size is on-going.

INTRODUCTION

Breast cancer is the third most common cancer of women in Thailand after cervix and liver.[1] The estimated national incidence rate is 13.5 cases per 100,000. This incidence appears to be low as compared to South East Asia (22.7), China (14.6) and Japan (23.5). The etiology of breast cancer is unknown but potential, risk factors have been observed. Changes in dietary patterns, breast-feeding patterns or life style may increase the incidence of breast cancer in Thailand as has been observed in similar circumstance in many developed Asian countries such as Singapore and Hong Kong.[2-4]

Most patients with breast cancer in Thailand were in stage II or greater when first diagnosed. Mammography has clearly been shown to be sensitive for early breast cancer detection. Results from several international studies have shown a reduction in breast cancer mortality rate of approximately 30%-40% from mammographic screening programs. We undertook a mammography screening trial at our institution in the hoping that the outcome would be profitable and effective for Thai women.

MATERIALS AND METHODS

Between June 1994 to December 1997, 1000 asymptomatic women, aged 40 years and older were offered entry into the screening mammography program. Physical examination was performed by the referring physician or the radiologist in case of self-referral.

Women were asked for general information, including marital status, education, menstruation and pregnancy history, breast feeding history,

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familial history of breast cancer, clinical breast symptoms, hormonal supplement, history of breast surgery and history of breast self examination.

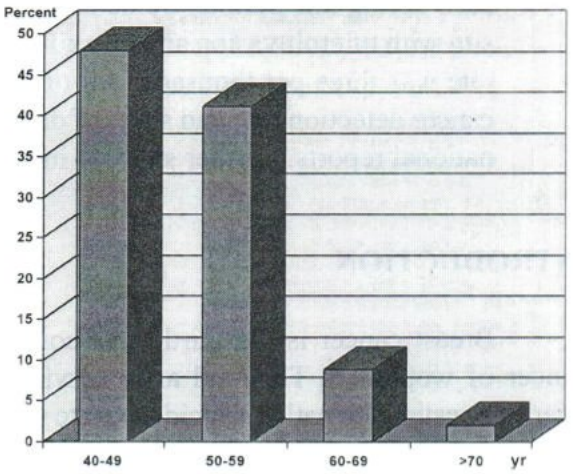
Two standard views were taken of each breast (one craniocaudal view and one mediolateral oblique view) by a dedicated mammography machine (Lorad MIII) and Kodak min-R screen-film combination. The films were reported by a qualified radiologist and graded into five categories according to the mammographic findings, 1.normal, 2.benign, 3.probably benign, 4.suspicious abnormality, 5. highly suggestive of malignancy. Additional view(s) or ultrasound of the breast may then be obtained accordingly in the same day. Women with grade 1 and 2 reports were discharged and return to annual screening. With grade 3 reports, they were asked to have a follow-up examination twice at 6 month intervals. With grade 4 and 5 reports, they were all referred to the surgeon.

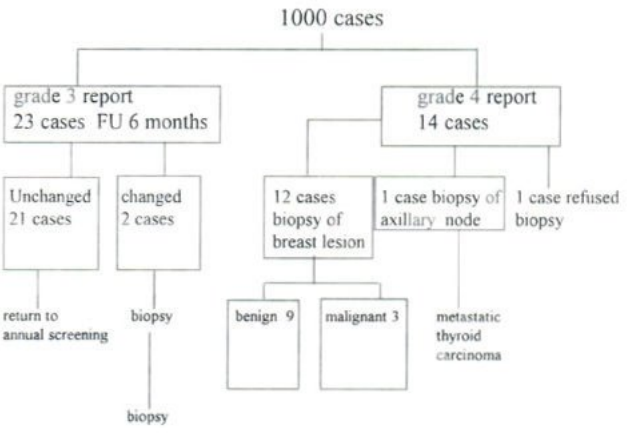
RESULTS

All women had the first screening mammography. There were 479 cases (47.9%) in the age group of 40-49 years, 412 cases (41.2%) aged 50-59 years, 89 cases (8.9%) aged 60-69 years and 20 cases (2%) aged 70 years or older (Table 1). Twenty-three patients had grade 3 reports. Of these, 21 patients showed unchanges after 6 months and 1 year follow-up. Two were biopsied after 6 months follow up and showed benign results. Fourteen patients had grade 4 reports and were advised to have biopsy. Of these, 13 had abnormal lesions in the breasts and 1 had abnormal enlarged axillary node which was proved to be metastatic thyroid carcinoma. One patient refused to have biopsy. Biopsy of the 12 breast lesions revealed ductal carcinoma-in-situ (DCIS) with microinvasion in 3 and benign lesions in 9 cases (Fig.1). The tumor size was 1 cm. in 2 cases (Fig 2) and 2 cm.in one case.

Biopsy was performed by hook-wire localization in 9 cases, stereotactic-guided needle core biopsy in 1 case and direct biopsy in 4 cases. The overall benign-to-malignant biopsy ratio was 3.7:1. All 3 cases with cancer detected were aged 40, 42 and 43 years. The lesions were nonpalpable with negative axillary node.

Table 1. Age distribution of 1000 women participating in screening program

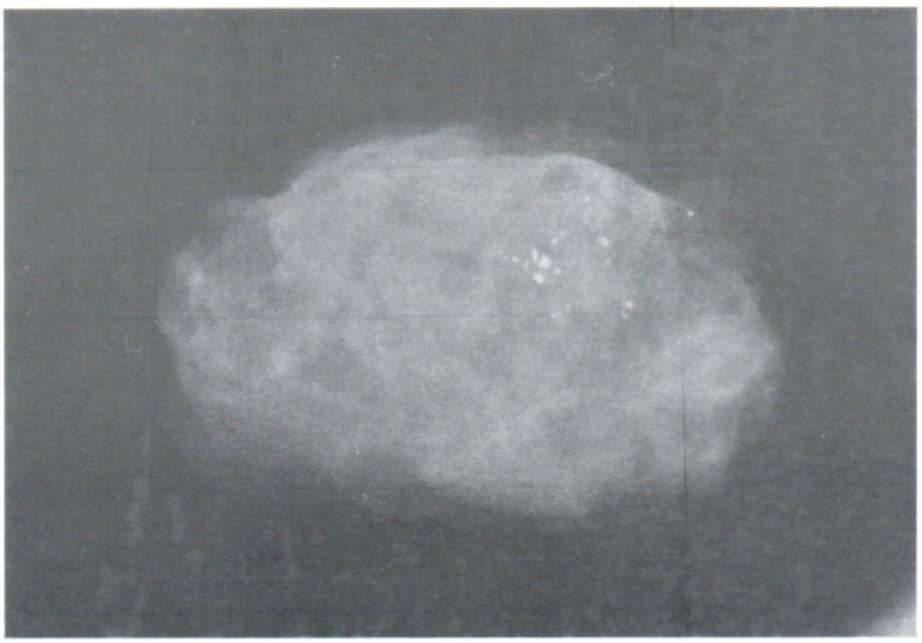




Benign : Malignant ratio = 3.7:1

Fig 1. Flow diagram of diagnostic pathways in 1000 screened women.

2A.



2B.

Fig. 2A. Magnification mammogram of a 40-year-old asymptomatic woman demonstrates a cluster of pleomorphic microcalcification (arrow). (B) Specimen radiograph confirms excision of the microcalcifications. Histology revealed ductal carcinoma-in-situ with microinvasion.

Table 2. Distribution of demographic characteristics in 786 women participating in screening program

Characteristics	No (%)
Age (yr)	
40-49	377 (48)
50-59	323 (41.1)
60-69	70 (8.9)
>70	16 (2.0)
Marital status	
Single	89 (11.3)
Married	604 (76.8)
Divorced	32 (4.1)
Widowed	61 (1.8)
Parity	
Nulliparous	153 (19.5)
Parous	633 (80.5)
Education	
below high school	205 (26.1)
high school graduate	180 (22.9)
university graduate or more	401 (51)
Cumulative duration of breast feeding (month)	
Never	180 (22.9)
<3	234 (29.8)
3-12	280 (35.6)
>12	92 (11.7)
Age at menarche (yr)	
12 or less	109 (13.9)
13-14	352 (44.8)
>15	325 (41.3)
Age at menopause (yr)	
45 or less	75 (9.5)
46-50	223 (28.4)
>50	158(20.1)
premenopause and hysterectomy	330 (42)
History of breast disease	
Yes	79 (10.1)
No	707 (89.9)
Familial history of breast carcinoma	
Yes	86 (10.9)
No	700 (89.1)
Breast self examination	
Yes	581 (73.9)
No	205 (26.1)

DISCUSSION

Mammography was introduced in Thailand only recently. Currently, we have approximately 51 mammography machines in Thailand. The machines are mostly in the big cities especially in Bangkok, and most of the studies are for diagnosis of breast diseases. Several international studies have shown that mammography is sensitive in detecting early breast cancer.[5-7] Breast cancers tend to increase in Asian women and mammography screening in Asian women is of proven benefit.[3-4]

Recruitment of women for mammography screening at our institution is quite a problem and it took time to convince both the physicians and women to accept the procedure. The demographic characteristics in our screened women showed that young and educated women were more concerned about their health. Seventy four percent regularly practiced breast self-examination. Approximately 11% of screened women had a familial history of breast cancer but all of breast cancers were detected in women with a negative familial history.

The cancer detection rate in our study was 3 per thousand. All 3 positive cases had DCIS with microinvasion and occured in young woman. This may be explained by the high proportion of young women in our study. The cancer detection rate from western countries is variable, ranging from 4 to 7 per thousand, and most of the patients are older than 50 years.[5-10] However, many studies have proven benefit from screening in women aged 40-49 years.[11] Only 2 large population trial mammography screening studies from Asia have been reported recently.[3-4] The overall cancer detection rate was 4.94 per thousand from Hong Kong and 4.8 per thousand from Singapore. In the study from Hong Kong, the cancer detection rate in women aged 40-49 years was 4.61 per thousand because of the high proportion of young women in the screened population. A previous study suggested that Asian breasts are small and relatively dense, and may not be suitable for mammography because of low sensitivity in detecting the lesion.[12] The modern mammography machines are now much improved and all our detected cancer cases were in young women with dense breasts. Our benign-to-malignant surgical biopsy ratio of 3.7:1 was quite similar to the international studies which ranged from 10:1 to 2:1.[13,14]

Our data regarding the stage of detected cancer clearly meets standard suggested by international experts. For example, Tabar[5] et al suggested that at least half of the cancers detected at mammographic screening would be less than 15 mm. in diameter and that 70% have no nodal involvement. However, it is too early to draw any firm conclusions as our sample size is too small. We intend to continue our study, recruit more women, provide a good-quality service and compare our results to those of the major well-organized breast screening centers worldwide.

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