

51,170

Breast Cancer Screening of 51,170 Women

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Purpose: The purpose of this study was to evaluate the efficacy of annual breast screening, which includes a mammography and a clinical physical examination.

Methods: From April 1995 to March 2000, we performed 51,170 annual clinical examinations and mammographies on 26,354 women, who wanted to undergo breast screening, at the breast center. Ninety-five breast cancers were detected during screening, and of these, only 76 breast cancers were operated on. The result were compared with 650 symptomatic breast cancers from the outpatient department (OPD).

Results: Of the 51,170 cases screened, the recall rate for further examination was 9.9% (n=5,066), and the biopsy rate was 2.1% (n=1,096). Ninety-five breast cancers were detected; a detection rate of 0.19%. Fourteen breast cancers were detected after more than 2 screening rounds. On the analysis of the medical audit data based on the screening mammographies, the positive predictive value, confirmed when a biopsy from a surgical consultation was recommended (PPV), was 8.6%. Further, 41 cases involving tumors found at stage 0 or I (54%). There were 25 cases of axillary lymph node metastasis (32.9%). These results were compatible with the ideal rates for medical audits, except for PPV and axillary lymph node metastases. The pathologic stages of the screened group were: 0, 22.4%; I, 31.6%; II, 40.8%; III, 5.2%, whereas those of the OPD group were 0, 3.4%; I, 27.4%; II, 52.8%; III, 15.5%, and IV, 0.8%. Early breast cancers were detected more frequently through screening than by the OPD (P < 0.05). Breast conservation surgery was carried out on 32.9% (25 cases) from the screened group,

but only 12.8% (83 cases) from the OPD group (P < 0.05). **Conclusion:** Our breast cancer screening was properly performed. Further, these findings indicate that breast cancer screening using a clinical examination and a mammography is very effective in the early detection of breast cancer. (J Korean Surg Soc 2002;63:11-17)

Key Words: Breast cancer screening, Mammography, Early breast cancer

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 : 2002 5 13 , : 2002 5 31
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가
 14.7%
 16.7 , 1998
 20.3 , 1999 22.4 , 가
 (I)
 1960
 7 Human
 Insurance Plan Project(2) 9
 29% ,
 2 (3,4) 6
 31%
 Feig (5) 60%
 가

가 ,

가 , (6)

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1995	4	2000	3	5
26,354	, 2	9,392		. 51,170
	1	32,951 (64.4%), 2		
	10,347 (20.2%), 3			5,088
(9.9%), 4		2,156 (4.2%), 5		625
(1.2%), 6		3 (0.02%)		
30				

, cone down view, magnification view

X

(Fig. 1).

95

658

19

5 , 4

ACR BI-RADS™ (American College of Radiology Breast Imaging Reporting and Data System):

(follow up and outcome monitoring)

(medical audit)

가 가 .(7)

2

14

가

Van Dijck

(8)

1) Screening error:

가 ,

2) Minimal sign present: 가

가

3) Radiographically occult: 가

4) Radiographically occult at diagnosis: 가

1

(Screen-detected cancer)

가

(interval cancer)

Window SPSS 10.0

Chi-square test

5,066 (9.9%)	, 51,170	26,354		51,170
(6.1%)				
		1,096 2.1%		
		95 0.19%		
		8.6%		
26,354				0.36%

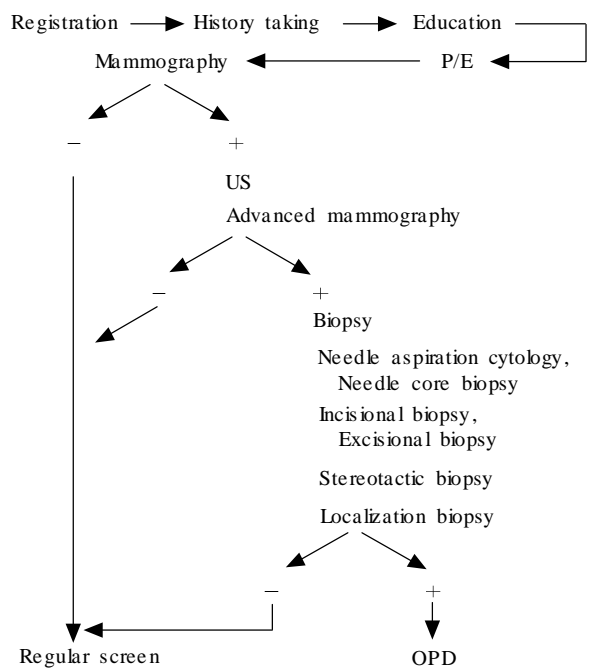


Fig. 1. Breast screening system.

26,354 81
 (0.31%), 2
 14 (0.15%) (Table 1).
 20 84
 10,058 (38.2%) , 40 8,900 (33.8%) 50
 40 1,000

Table 1. Results of breast cancer screening

Total examines (CBE*±MMG [†])	51,170 (100%)
Further examination recommended	5,066 (9.9%)
Further examination performed	3,122 (6.1%)
Biopsy	1,096 (2.1%)
Benign	1,001 (1.96%)
Malignancy	95 (0.19%)
<hr/>	
Total patients	26,354 (100%)
Benign	1,001 (3.8%)
Malignancy	95 (0.36%)
First visitors	81/26,354 (0.31%)
Second visitors .etc	14/9,392 (0.15%)

*CBE = clinical breast examination; [†]MMG = mammography.

Table 2. Age distribution and cancer detection rate of 26,354 screened women according to age

Age	No. women (%)	No. ca.	Ca detection rate (per 1,000)
29	434 (1.6)	3	6.9
30-39	3,712 (14.1)	11	2.96
40-49	8,900 (33.8)	38	4.26
50-59	10,058 (38.2)	40	3.97
60-69	2,948 (11.2)	2	0.68
70	302 (1.1)	1	3.31
Total	26,354 (100)	95	3.6

20 가 6.9 가 , 50
 가 . ,

(Table 2).

658
 23 77 . 649
 76
 I 가 31.6%, 0 22.4%, IIa 30.3%
 84.3% , IIa가
 34.8%, I 가 27.4%, 0 가 3.4% 가 65.6%

(Fig. 2).

가
 51
 (67.1%), 25 (32.9%) ,

가 566 (87.2%),
 가 83 (12.8%)

(Fig. 3)(P=0.00).

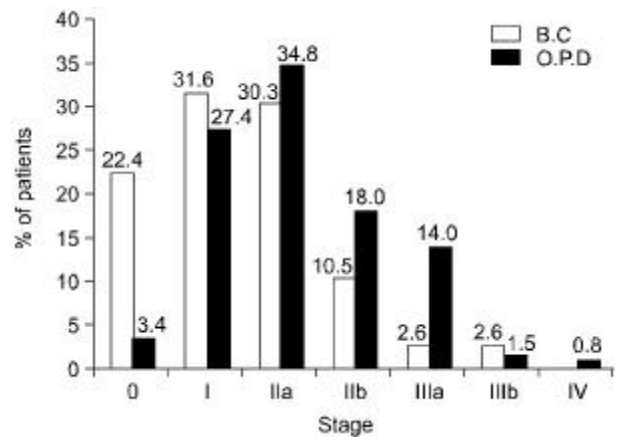


Fig. 2. The comparison of pathologic stages of breast cancers detected between in breast center and in O.P.D (P<0.05).

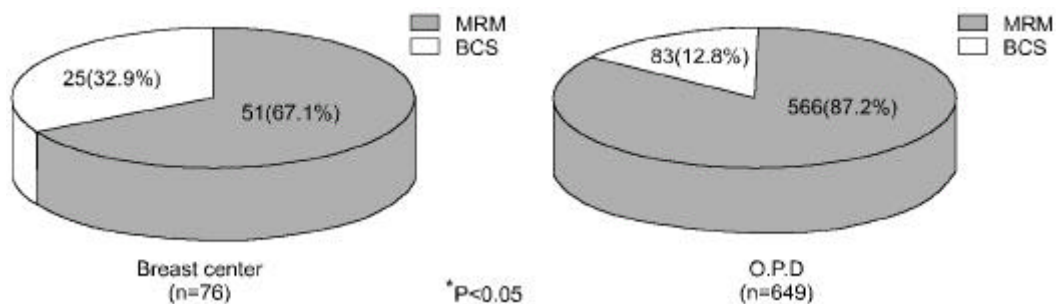


Fig. 3. The comparison of operative methods of breast cancer between in breast center and in O.P.D.

9.9%, Case 12 1 10 (case 3) (Table 4).
 8.6%, 0 1 10
 76 41 54%, Case 13 2 8
 25 32.9% (Table 3). 3
 2 14 Case 14 5 10
 screening error 6
 case 1, Case 1
 minimal sign present case 2, 4, 5 3, radiologi- 11
 cally occult 9 (case 6 14). Radiologically oc- (screen - detected ca) , 가
 cult at diagnosis 1 Case 12, 13, 14 .
 , 2 26,354 3 1,000
 0.1 .

Table 3. Analysis of medical audit data of screening mammo-
 graphy

Audit data	Desirable goals	Our data	1/4
Positive predictive value when biopsy or surgical consultation recommended	25 40%	8.6%	가 가 .(I) 20
Tumor found-stage 0 or 1	>50%	54% (41/76)	가
Node positive	<25%	32.9% (25/76)	
Cancer found/1,000 cases	2 10	3.6	1800
Recall rate	< 10%	9.9%	1900

Table 4. Breast cancer not diagnosed on previous screen

Case	Age	Round	Previous screen			Recent screen					OP	TNM	Van dijck (pre/recent)	
			Sx	PE	MMG	Sx	PE	MMG	Us	Bx				Dx
1	55	2	(-)	(-)	MC B	(-)	(-)	CMC M	(-)	LB	DCIS	BCS. Lt	TisN0M0	(+ / +)
2	53	2	(-)	(-)	ND B	(-)	(-)	ND M		LB	IDC	MRM. Lt	T1N0M0	(± / +)
3	56	2	NE	NE	(-)	NE	NE	(-)		IB	IDC	MRM. Lt	T1N1M0	(- / -)
4	39	4	(-)	(-)	MC B	(-)	(-)	CMC M	(-)	LB	DCIS	BCS. Lt	TisN0M0	(± / +)
5	55	5	(-)	(-)	MC B	(-)	(-)	CMC M		LB	DCIS	BCS. Lt	TisN0M0	(± / +)
6	51	2	(-)	(-)	(-)	(-)	(-)	ND M	Mass M	CNB	IDC	MRM. Rt	T1N0M0	(- / +)
7	48	2	(-)	(-)	(-)	(-)	(-)	CMC M		LB	IDC	MRM. Lt	T1N0M0	(- / +)
8	49	2	(-)	(-)	(-)	(-)	(-)	CMC M	(-)	LB	DCIS	MRM. Rt	TisN0M0	(- / +)
9	53	3	(-)	(-)	(-)	(-)	(-)	CMC M	(-)	LB	DCIS	BCS. Lt	TisN0M0	(- / +)
10	46	3	(-)	(-)	(-)	(-)	(-)	CMC M	Mass M	CNB	IDC	BCS. Rt	T1N0M0	(- / +)
11	44	4	(-)	(-)	(-)	(-)	(-)	CMC M		LB	IDC	BCS. Lt	T1N0M0	(- / +)
12	45	2	(-)	(-)	(-)	Mass	Mass	AD	Mass M	CNB	IDC	MRM. Rt	T1N0M0	(- / +)
13	58	3	(-)	(-)	(-)	Mass	Mass	AD	Mass M	CNB	IDC	BCS. Lt	T1N0M0	(- / +)
14	60	6	(-)	(-)	(-)	Mass	Mass	CMC M		CNB	DCIS	MRM. Rt	TisN0M0	(- / +)

AD = asymmetric density; B = benign; BCS = breast conserving surgery; CMC = clustered microcalcifications; CNB = core needle biopsy; IB = incisional biopsy; IDC = invasive ductal carcinoma; LB = localization biopsy; M = malignancy; MC = microcalcifications; MRM = modified radical mastectomy; ND = nodular density; NE = nipple erosion.

가 . 10% , 0 1 3.6 , 50% , 1,000
time bias, lead 가 25% 2 10 32.9%
length-time bias, 가 25% .
selection bias
(9) 1960 가 8.6% 25% 가
(2-5) 가
(National cancer institute) 1997 40 가 , ,
1 2 , (10) 가 가 ,
(American Cancer Society) 가 가 가
(American College of Radiology) , , 가
40 , , 가
(11) 가 , 30 80
가 가 40 50 ,
(1, 12-14) , 50 70 , 20
34% , 40 ,
13% 40 가
30 , 40 , 20
(13, 15, 16) Tabar (16) 40 가 , 40 가 , 50
(mean sojourn time) 1.7 , 50 3.3 , 60 ,
3.8 , 30 , 40
, , 가
(18-20) ,
(21) 가 0 1 가
(22) (23)
bias ,
Sickles(17)가 (medical audit) 2 14 Van Dijck
(interval cancer)
(screen-detected cancer) 9.9%,
missed diagnosis 54%, 1,000 radiologically occult

가 9 가 , screening error, minimal sign
 present 가 4 . Van Dijk (8) minimal sign
 present 가 30 40% radiologically occult
 33 58% , 2

screen error, minimal sign present, radiologically occult
 present 가 minimal sign 1

553,501 2
 1,000 0.95
 ,(25) Somme Department 3
 1,000 0.51 ,(26)
 2
 10,000 18.2 ,(27)
 1

1,000 0.1 ,
 1
 26,354

가

가

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