

BI-RADS

가¹

BI-RADS

BI-RADS : 2004 1 12

368 471

BI-RADS

2 3 4

5

2 298 , 3 21 , 4 108 , 5 44

1% (3/298), 4.7% (1/21), 8.3% (9/108),

90.9% (40/44) . 4 4a 5.4% (5/92), 4b 1.3% (1/8), 4c 50% (4/8)

90.6%, 75.1%, 31.6%,

98.4%

가

가

BI-RADS

가 (1, 2) BI-RADS (12)

2003 (13).

(3, 4), 17), BI-RADS (14-

가

BI-RADS

가 (taller than wide) , , 가

(5-11).

(American College of Radiology) 2004 1 2004 12

(Breast Imaging Reporting and Data system; 368 471

BI-RADS

. 14G 70 , 8G

396 ,

1
2
3

가 : BI-RADS 가

가 4b(intermediate), 4c(moderate likelihood of malignancy)

가 14 .

HDI 5000 (Philips, Bothell WA, U.S.A.) 2 3

7-12 MHz linear array transducer , 4 5

가 2(benign finding), (1

3(probably benign lesion), 4(suspicious cm, 1.1-2 cm, 2.1-3 cm, >3 cm

malignant lesion), 5(highly suggestive of malignancy) . 1 cm

BI-RADS , , , 가

가 (taller than wide) , 가

가 가

가 가

가 2 471 59

가 (lobular) 12.5%

가 , 3 2 298 , 3 21 , 4

가 , 4 가 , 2 8 (2.7%), 3 1 (4.8%), 4 10

가 , 4 가 , 5 40 (90.9%)

가 4 4a 5 (5.4%), 4b 1 (1.3%), 4c 1

가 5 , 4 (1.3%) (Table 1).

가 4a (low), 384 13 (3.4%)

Table 1. Malignancy Rate to US-BIRADS Category in Breast Lesions

US-BIRADS	No of the Lesions	No of the Malignant Lesions (%)	Percentage of the Malignant Lesions
C2	298	8 (2.7)	13.6
C3	21	1 (4.8)	1.7
C4	108	10 (9.3)	16.9
	C4a	92	5 (5.4)
	C4b	8	1 (1.3)
	C4c	8	1 (1.3)
C5	44	40 (90.9)	67.8

Table 2. Sonographic-Histologic Correlation

US-BIRDS	Malignancy (C4 and C5) Benign (C2 and C3)	Histologic Findings		Total
		Malignancy	Benign	
	Malignancy (C4 and C5)	48	104	152
	Benign (C2 and C3)	5	314	319
	Total	53	418	471

Sensitivity 48/53(90.6%), Specificity 314/418(75.1%), Accuracy 362/471(76.9%)
 Positive predictive value 48/152(31.6%), Negative predictive value 314/319(98.4%)

70 30 (42.9%)
 17 16 (94.1%)
 가
 가 14
 , 1 cm 245 10
 (4%), 1.1-2 cm 159 21 (13.2%), 2.1-3 cm
 42 10 (23.8%), 3.1 cm 15 11 (73.3%)
 2
 160, 107, 23, 8 , 3 16, 10, 5, 0 , 4
 72, 24, 10, 2 , 5 6, 2, 9, 7
 1.07 cm,
 2.05 cm (Fig. 1).
 10
 412
 (fibroadenoma) 239 ,
 (fibrocystic change)가 108 , (fibrosis)
 24 , (sclerosing adenosis) 15 ,
 (intraductal papilloma) 9 , (ductal
 hyperplasia) (ductectasia) 5 ,
 (inflammation) 3 , (adenoma) 2 , (hematoma) 1
 , (microcalcification) 1
 59 (invasive ductal carcinoma) 38 ,
 (DCIS) 4 ,
 (atypical duct hyperplasia) 4 , (mucinous
 carcinoma) 3 , (atypical medullary
 carcinoma), (invasive lobular carcinoma)
 carcinoma) 1 , (metaplastic
 carcinoma) 1
 가 6 , 2 , 2
 24 17
 2 4 가 4a, 3 가 3 ,

가 18 , 3 , 1 ,
 1 , 1
 0.89 cm 1.18 cm
 2 3 , 4 5
 48 , 가 5 , 가 104
 18/53 (93.6%) , 314/418 (75.1%)
 , 48/152 (31.6%),
 314/319 (98.4%), 362/471 (98.4%)
 (Table 2).

1
 가 가 , 2-3 cm
 (Table 3).

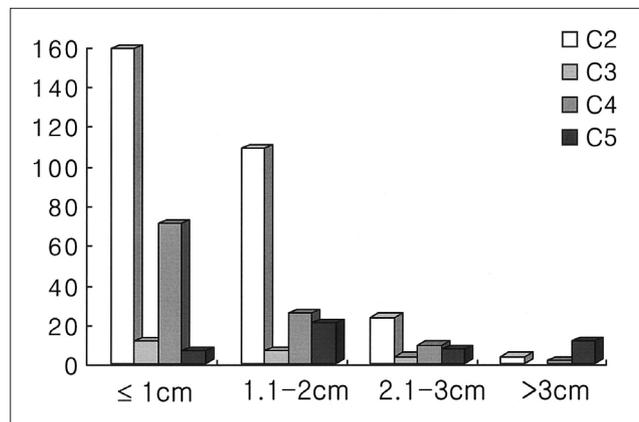


Fig. 1. Categorical Distribution according to the Mass Size.

Table 3. Multivariate Logistic Regression for Malignant Histologic Findings

Characteristics	Classification	adjusted Odds Ratio	p-value
Age		1.023	0.432
Margin	Well defined	1.000	
	Ill defined	28.79	0.000
	Microlobulated	55.50	0.001
Shape	Lobular, Oval, Round	1.000	
	Irregular (including spiculated)	2.777	0.158
Inhomogeneity	-	1.000	
	+	5.518	0.004
Increased vascular flow on Doppler US	-	1.000	
	+	5.088	0.158
Peripheral halo	-	1.000	
	+	4.774	0.197

: BI-RADS 가

11.5%, 100%, 38.8%, Stavros
(10) 98.4%, 67.8%, 38.0%,
99.5%, 72.9% Stavros (10)

(BI - RADS)

가 가

2003 가 4 2 0.08, 3 0.45, 4 1.04 (4a: 1.01, 4b: 1.38,
BI-RADS 5 2.27
BI-RADS 1.98 0.34

가 가

BI-RADS 가

4 90.6%

2 3 가
4 5 12.5% 가

Hong (18) BI-RADS 가 1 가 (taller than wide) 4
4 가 4
가 Stavros (10) 2 4

가

4 8.3%, 5 2 1%, 3 4.7%, BI - (desmoplastic)
RADS 2 0%,
3 2% , 4 3% 94%, 5 95% 가
4 2, 3, 5

BI - RADS , Tan (19)

(17) 4 27.2%, 5 84.2% Liberman
(14) 4 34%, 5 81%, Orel (16) 가 (9). Nishimura (20)
4 30%, 5 97% BI-RADS가 가

가 4 5 가 가 (20).
2 3 가

(21).

2 3 가 가

2 3 , 4 5 가 가
90.6%, 75.1%

31.6%, 98.4%, 98.4% 가 가
Buchberger (11) 100%, 33.5% 가 가

(22).
 3 (1 - 2 mm)
 가 가 가 (23).
 가
 가 (7, 19)
 20 4 2 (10%)
 가
 가 4 3% 94%
 a, b, c
 가
 a
 b c
 4a 가
 가
 3
 4 a, b, c b
 c 가
 BI - RADS
 ACR

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Categorization and Evaluation of Usefulness of Breast Lesions with using Ultrasound BI-RADS (Breast Imaging Reporting and Data system)¹

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Purpose: The aim of our study was to determine the positive predictive value (PPV) and to evaluate the usefulness of ultrasound BI-RADS, as compared with the histologic results of breast lesions that were categorized and classified by the ultrasound BI-RADS lexicon.

Materials and Methods: Between January and December 2004, the ultrasound features of 471 breast lesions in 368 patients were analyzed and categorized with using ultrasound BI-RADS. All of the lesions were compared with the histological results. We categorized category 2 and 3 lesions as benign lesions, and category 4 and 5 lesions as malignant lesions. We then calculated the sensitivity, specificity, positive predictive value, negative predictive value and accuracy.

Results: The breast lesions were histologically diagnosed as 298 cases of category 2, 21 cases of category 3, 108 cases of category 4 and 44 cases of category 5. The categorical malignancy rate was 1% (3/298) in category 2 lesions, 4.7% (1/21) in category 3 lesions, 8.3% (9/108) in category 4 lesions and 90.9% (40/44) in category 5 lesions. Within category 4, the malignancy rate for category 4a lesions was 5.4% (5/92), the malignancy rate for category 4b lesions was 1.3% (1/8) and the malignancy rate for category 4c lesions was 50% (4/8). The sensitivity, specificity, positive predictive value and negative predictive value were 90.6%, 75.1%, 31.6% and 98.4%, respectively. The statistically valid ultrasound features that were correlated with malignancy were an ill defined margin, a microlobulated mass, an irregular mass, inhomogenic echogenicity, an echogenic halo and an older patient age.

Conclusion: Ultrasound BI-RADS was useful in differentiating benign from malignant breast lesions.

Index words : Breast, disease, Breast, Ultrasound (US)

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