1

. ¹, ⁴ . . ². ³

:

.

: 2002 6 2004 6
113 . , ,
, , / ,
. .
: 113 17 , 10 , 19 ,
24 . /
16 5 (31.3%) 27 17 (63%) 43
22 (51.2%) . 43
36 17 (47%)
27 10 (37%) .
: , ,
. .
.

40

113

(n = 78), (n = 24), (n = 11)
. (1, 2). . 113
0.3-2.0% 64 (56%)
(3).

.

. 44.6 (15-7)
23 mm (5-140 mm) . 7-10 MHz
GE
LogiQ 700 Expert Series (GE Medical systems, Milwaukee,
2002 6 2004 6 Wisconsin, U.S.A.) ATL (Advanced Technology
3364 330 330 Laboratories, Bothell, WA) HDI 5000 .
. Berg (1)
(simple cysts)

,
1
2 (clustered cysts)
3
4 ,
2005 1 25 2005 12 29 . (cysts with thin septa) 0.5 mm

(complicated cysts) Breast Imaging Reporting and Data System(BI- RADS) (4)

-

. /

(cystic masses with thick wall/ septa or nodules) 0.5 mm

50%

(complex solid and cystic masses) 50%

(Table 1).

2

.

/

43

.

Table 1 .

,

17 (n= 16), (n= 1)

. 10 (n= 1) (n= 9)

19 (n= 12)

(n= 7) (Figs. 1, 2),

24 (n= 2)

(n= 6), (n= 15), (mucocele- like tumor) (n= 1) (Fig. 3).

16 , 15 (n= 13)

(n= 2)

. 17 7

(n= 2)

(n= 5) . 16

/ 11 (n= 1),

(n= 1), (n= 5), (mucocele-like tumor) (n= 1), (n= 3) 5

(infiltrative ductal carcinoma, IDC) (n= 4) (papillary carcinoma) (n= 1) (Fig. 4). 27

10

(n= 5), (n= 1), (n= 2), (n= 2)

17 (n= 9) (Fig. 5),

(metaplastic carcinoma) (n= 4), (malignant

Table 1. Subclassification, Method of Sampling, & Rates of Malignancy of 113 Cystic Lesions

Sonographic feature	Aspirtaion	CNB	Excision	Rate of Malignant
Simple cysts (n = 17)	14	2	1	-
Clustered cysts (n = 10)	4	4	2	-
Cysts with thin septa (n = 19)	14	3	2	-
Complicated cysts (n = 24)	17	5	2	-
Cystic masses with thick wall/ septa or nodules (n = 16)	11	1	4	5 (23)
Complex solid and cystic masses (n = 27)	18	9	-	17 (77)
Total (n = 113)	78	24	11	22 (100)

Note.- Data are the number of lesions. Data in parentheses are percentages.
CNB: core needle biopsy
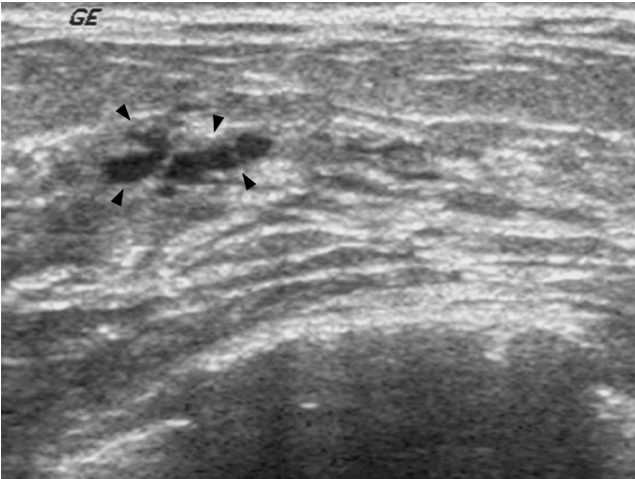
Fig. 1. A 44-year-old woman with clustered cysts. Transverse US scan shows an aggregate of small cysts (arrowheads) without discrete solid component. The lesion was incidentally detected during screening examination. Aspiration cytology revealed fibrocystic change.
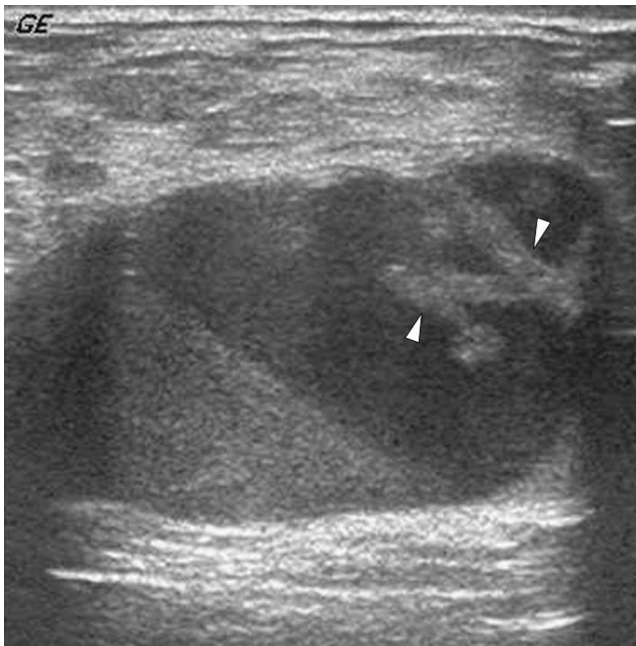
Fig. 2. A 27-year-old woman with cyst with thin septa. Radial US scan shows a cyst with thin (< 0.5 mm) septa (arrowheads) that otherwise met the criteria for a simple cyst. The cyst disappeared after aspiration and the pathologic result was benign cyst contents.
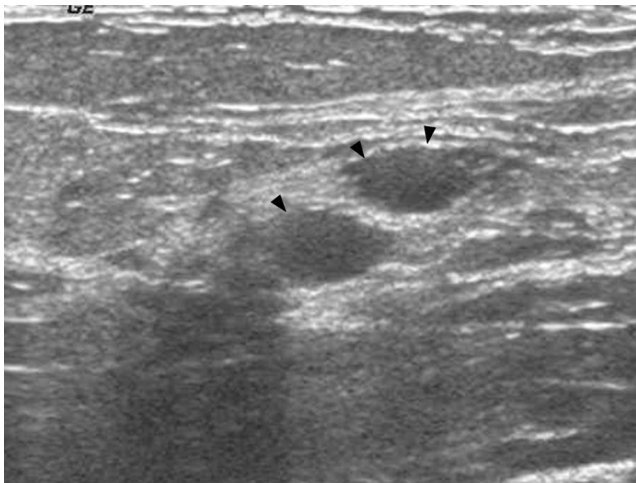
Fig. 3. A 27-year-old woman with complicated cysts. Transverse US scan shows well-defined, oval masses with homogeneous internal echoes (arrowheads) with tubular structure of radial US scan (not seen). Aspiration yielded mucinous material with atypical cell and following excisional biopsy revealed mucocele-like tumor with foci of intraductal papilloma.
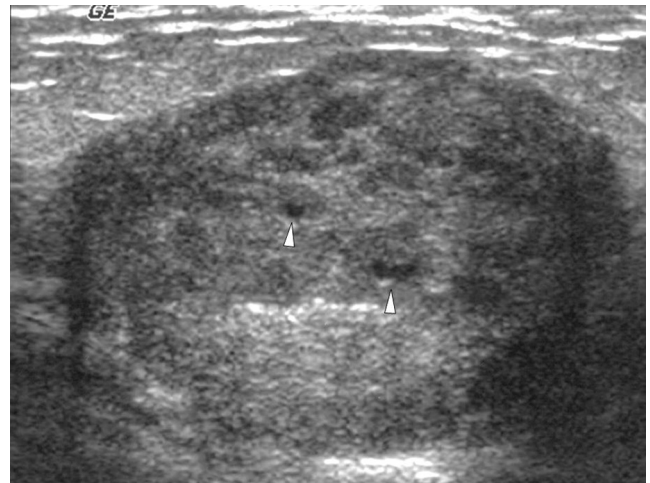
Fig. 5. A 37-year-old woman with complex solid and cystic mass. Transverse US scan shows well-circumscribed, oval solid mass with internal small cystic components (arrowheads). The pathologic result was infiltrative ductal carcinoma of anaplastic type.

Fig. 4. A 64-year-old woman with cystic mass with thick septa and nodule. Transverse US scan shows a well-circumscribed, oval cystic mass with thick septa (arrowheads) and mural nodular component. Fluid-debris level is also seen. Aspiration yielded bloody fluid and following core needle biopsy revealed low-grade intraductal papillary carcinoma.

phyllodes tumor) (*n*=3), (mucinous carcinoma) (*n*=1) (Table 2).

/

43 22 (51.2%) . 43

36
17 (47%) 27 10 (37%) (Table 3).

10 (22%) . 2 20
7 , 4 , 6 , 3 .

40
BI-RADS category 2, .

(4-8).

,
(1).

(tissue harmonic image) (9).
100% 2-3 mm (1).
(spatial compounding image)
(10).

Table 2. Correlation of Pathologic Outcome & Sonographic Features for 113 Cystic Lesions

Finding	Simple cyst	Clustered cysts	Cysts with thin septa	Complicated cyst	Cystic masses with thick wall /septa or nodules	Complex solid and cyst	Total
Benign							
Cyst	16	1	12	2	1	-	32 (28.3)
FCC	1	9	7	6	1	5	29 (25.6)
Abscess	-	-	-	15	5	1	21 (18.6)
Mucocele-like tumor	-	-	-	1	1	-	2 (1.8)
Fibroadenoma	-	-	-	-	-	2	2 (1.8)
Papilloma	-	-	-	-	3	2	5 (4.4)
	17 (100)	10 (100)	19 (100)	24 (100)	11 (68.7)	10 (37.0)	91 (80.5)
Malignant							
IDC	-	-	-	-	4	9	13 (11.5)
Metaplastic ca	-	-	-	-	-	4	4 (3.5)
Malignant Phyllodes	-	-	-	-	-	3	3 (2.7)
Papillary ca	-	-	-	-	1	-	1 (0.9)
Mucinous ca	-	-	-	-	-	1	1 (0.9)
	0	0	0	0	5 (31.3)	17 (63.0)	22 (19.5)
Total	17 (100)	10 (100)	19 (100)	24 (100)	16 (100)	27 (100)	113 (100)

Note.- Data are the number of lesions. Data in parentheses are percentages.
FCC: fibrocystic disease, IDC: infiltrative ductal carcinoma, ca: carcinoma

Table 3. Sonographic Findings of 43 Cystic Masses with Solid Component and Rates of Malignancy

		No. of lesion	No. of Malignant lesion
Shape	Round	9 (100)	7 (78)
	Oval	27 (100)	10 (37)
	Irregular	7 (100)	5 (71)
Margin	Circumscribed	27 (100)	10 (37)
	Indistinct	2 (100)	2 (100)
	Angular	3 (100)	2 (67)
	Microlobulated	11 (100)	8 (73)
	Spiculated	0 (100)	0 (0)
Total No.		43 (100)	22 (51.2)

Note.- Data are the number of lesions. Data in parentheses are percentage.

. Venta

(8)   308   0.3%

.

Buchberger (12) 133   Kolb
(13) 126   .
24   1
(Fig. 3).

,

(apocrine meta-
plasia)   Berg (1) 35%
86%   .

(11).

9   8

.

.   /
16
(1, 3, 5, 8).   5 (31.3%)   4 (80%),
-        1   .   ,   ,
,
24   15 (62.5%)   .   .

(1, 14).

/

(2-3   )

(1).

. Jackson   (15)

. Liberman   (16)

Berg   (1)

0.3-2.0%
90%   3 cm

(3, 17-19).

(3, 19, 20).

0.3%   (21).
Berg   (1)

54   12 (22%)

33

45   10 (22%)   .

1. Berg WA, Campassi CI, Ioffe OB. Cystic lesions of the breast: sono-graphic-pathologic correlation. *Radiology* 2003;227:183-191
2. Bassett LW. Imaging of breast masses. *Radiol Clin North Am* 2000; 38:669-691
3. Omori LM, Hisa N, Ohkuma K, Fujikura Y, Hiramatsu K, Enomoto I, et al. Breast masses with mixed cystic-solid sonograph-ic appearance. *J Clin Ultrasound* 1993;21:489-495
4. American College of Radiology. *Breast imaging reporting and data system (BI-RADSTM) ultrasound*. Reston, VA: American College of Radiology, 2003
5. Mendelson EB, Berg WA, Merritt CR. Toward a standardized breast ultrasound lexicon, BI-RADS: ultrasound. *Semin Roentgenol* 2001;36:217-225
6. Hilton SV, Leopold GR, Olson LK, Willson SA. Real-time breast sonography: application in 300 consecutive patients. *AJR Am J Roentgenol* 1986;147:479-486
7. American College of Radiology. *Breast Imaging Reporting and Data System.* 3rd ed. Reston, VA: American College of Radiology, 1998
8. Venta LA, Kim JP, Pelloski CE, Morrow M. Management of com-plex breast cysts. *AJR Am J Roentgenol* 1999;173:1331-1336
9. Sklair-Levy M, Muradali D, Kulkarini S. Linear transducer har-monic imaging: improved characterization of breast cysts com-pared to conventional sonography. *AJR Am J Roentgenol* 2001;176: 6-7
10. Merritt C, Piccoli C, Forsberg F, Wilkes A, Cavanaugh B, Lee S. Real-time spatial compound imaging of the breast: clinical evalua-tion of mass. *Radiology* 2000;217:491-492
11. Warner JK, Kumar D, Berg WA. Apocrine metaplasia: mammo-graphic and sonographic appearances. *AJR Am J Roentgenol* 1998; 170:1375-1379
12. Buchberger W, DeKoekkoek-Doll P, Springer P, Obrist P, Dunser M. Incidental findings on sonography of the breast: clinical signifi-cance and diagnostic workup. *AJR Am J Roentgenol* 1999;173:921-927
13. Kolb TM, Lichy J, Newhouse JH. Occult cancer in women with dense breasts: detection with screening US-diagnostic yield and tu-mor characteristics. *Radiology* 1998;207:191-199
14. Soo MS, Kornguth PJ, Hertzberg BS. Fat necrosis in the breast: sonographic features. *Radiology* 1998;206;261-269
15. Jackson VP, Rothschild PA, Kreipke DL, Mail JT, Holden RW. The spectrum of sonographic findings of fibroadenoma of the breast. *Invest Radiol* 1986;21:34-40
16. Liberman L, Bonaccio E, Hamele-Bena D, Abramson AF, Cohen MA, Dershaw DD. Benign and malignant phyllodes tumors: mam-mographic and sonographic findings. *Radiology* 1996;198:121-124
17. Kersschot EA, Hoste MV, Dochez CL, van Marck EA, De Schepper AM, Van Goethem ML. Intracystic carcinoma of the breast. *Rofo* 1986;144:728-279
18. Reuter K, D'Orsi CJ, Reale F. Intracystic carcinoma of the breast: the role of ultrasonography. *Radiology* 1984;153:233-234
19. Czernobilsky B. Intracystic carcinoma of the female breast. *Surg Gynecol Obstet* 1967; 124:93-98

:

20. Ravichandran D, Carty NJ, al-Talib RK, Rubin C, Royle GT, Taylor I. Cystic carcinoma of the breast: a trap for the unwary. *Ann R Coll Engl* 1995;77:123-126

21. Knelson MH, el Yousef SJ, Goldberg RE, Ballance W. Intracystic papillary carcinoma of the breast:mammographic, sonographic, and MR appearance with pathologic correlation. *J Comput Assist Tomogr* 1987;11:1074-1076

Differentiation of Benign and Malignant Cystic Lesions of the Breast according to Sonographic Findings[1]

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Purpose: To classify the ultrasonographic findings of cystic lesions of the breast and correlated them with the pathology, to evaluate the characteristic features of cystic masses in benign and malignant tumors, and to determine the appropriate level of patient management according to the ultrasonographic findings.

Materials and Methods: From June 2002 through to June 2004, the ultrasonographic findings of 113 pathological proven cystic breast lesions were reviewed retrospectively. The cystic lesions were classified as simple cysts, clustered cysts, cysts with thin septa, complicated cysts, cystic masses with a thick wall/ septa or nodules, and complex solid and cystic masses. The ultrasonographic findings of each type of cystic lesion of the breast were compared with the pathology and evaluated according to whether they were benign or malignant.

Results: Of the 113 lesions, there were 17 simple cysts, 10 clustered cysts and 19 cysts with thin septa. Twenty four cases of complicated cysts were found to be benign. Five (31.3%) of the 16 cases of cystic masses with a thick wall / septa or nodules and 17 (63%) of the 27 cases of complex solid and cystic masses were found to be malignant. The shape and margin of the 43 cases of cystic masses with a solid component were analyzed. Seventeen out of 36 sonographical round or oval shaped masses and 10 out of 27 sonographical circumscribed margins were found to be malignant.

Conclusion: The simple cysts, clustered cysts, cyst with thin septa and non-symptomatic complicated cysts detected by sonography were all benign. Symptomatic complicated cysts should be aspirated and treated appropriately. Cystic masses with a solid component should be examined by a biopsy with a pathological confirmation.

Index words : Breast, cysts
Breast, US
Breast, diseases

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