

: (MRI) , (US) MRI
 : 9 4
 , US MRI , US
 , MRI T1 , T2
 3D-GRE , -
 : . US
 . 3D-GRE MRI
 6 (66.7%) , 3 (40.7%)
 (100%)
 8 (88.9%)
 가 (100%)
 5 (55.6%) 5 , 4 (44.4%)
 : 3D-GRE MRI 3 (75%) 1
 , 가 MRI 가

(1, 2). MRI 1 MRI
 가 가 (3-8). 5 9
 가 , 4 , 13(: =1:12)
 1

1
 2

S*: Skin P: Parenchymal layer R: Retromammary fatty layer.
M: Mild S†: Strong S‡: Slow R: Rapid I: Irregular
PA: Pyogenic abscess IC: Inflammatory cancer

가
가
가 (Fig. 2C, D).
가 가
(Fig. 2B).

MRI	(Fig. 1D, Fig. 2E, F)	T1	
	T2		
3D-GRE	MRI (Fig. 1E,		
Fig. 2G, H)			
(Table 3).	6 (66.7%)		
	, 3 (40.7%)	1 (11%)	, 8
		(88.9%)	

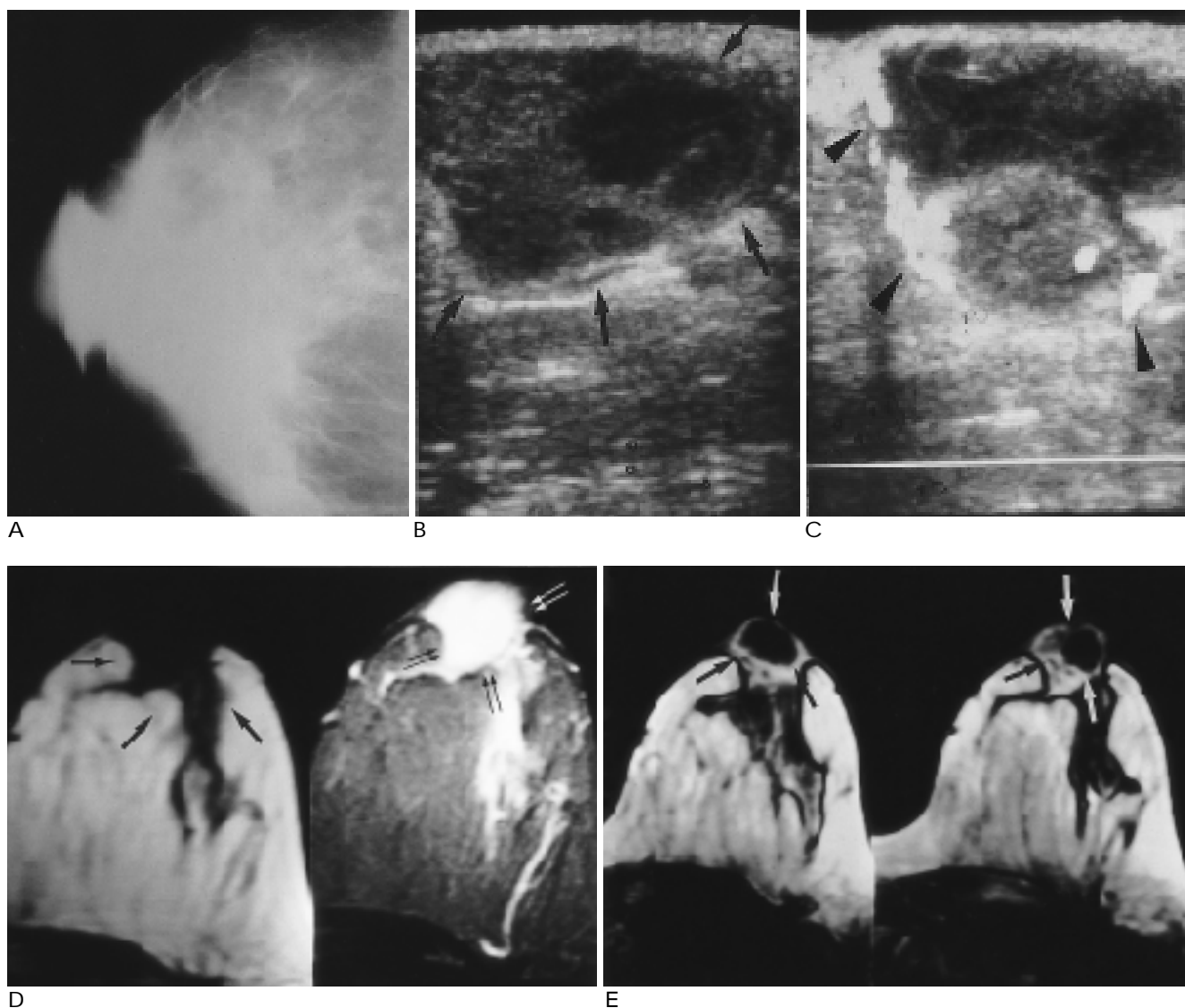


Fig. 1. 28 year-old women with pyogenic abscess in breast.

A. Mammogram shows subareolar subcutaneous thickening and asymmetrically increased density in parenchyma.

B. Ultrasonogram shows a relatively well demarcated heterogenous hypoechoic lesion with internal anechoic portion with posterior acoustic enhancement(arrows).

C. Color Doppler ultrasonogram shows abundant vascularized rim(arrowheads).

D. Axial Spin-echo T1 weighted MRI shows an irregular low signal intensity lesion (arrows) in periareolar area. Inversion-recovery T2 weighted image shows a high signal intensity lesion(double arrows).

E. Axial 3D-GRE dynamic MRI shows a central non-enhancing portion with irregular thick peripheral enhancing rim(arrows), extending to the surrounding parenchyma, which shows also mild degree heterogenous enhancement.

가 2 (22.2%) 1 (25%)
 2 (22.2%) 3 (75%)
 (77.8%) 5 (55.6%) 7

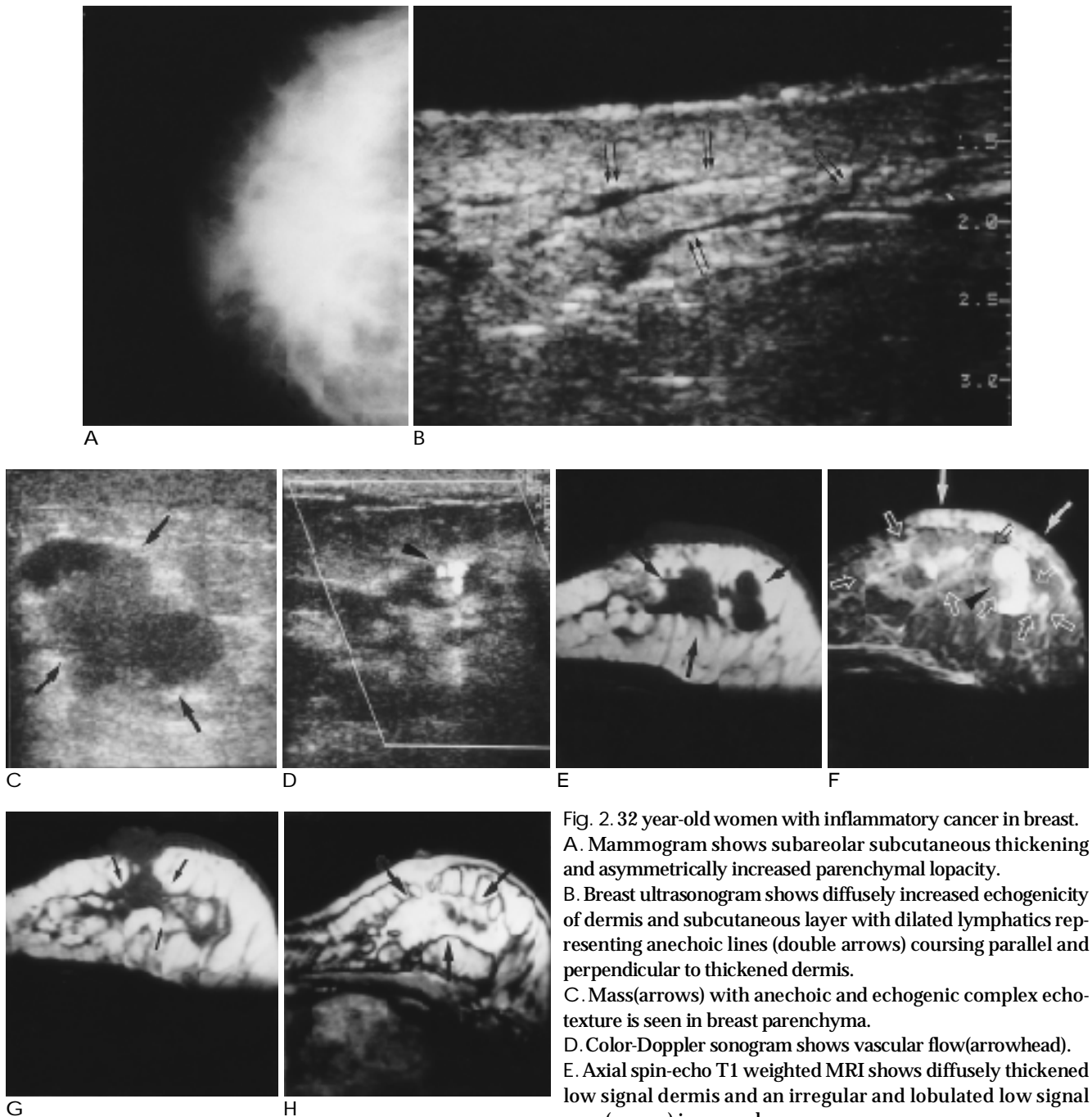


Fig. 2. 32 year-old women with inflammatory cancer in breast.
 A. Mammogram shows subareolar subcutaneous thickening and asymmetrically increased parenchymal opacity.
 B. Breast ultrasonogram shows diffusely increased echogenicity of dermis and subcutaneous layer with dilated lymphatics representing anechoic lines (double arrows) coursing parallel and perpendicular to thickened dermis.
 C. Mass (arrows) with anechoic and echogenic complex echotexture is seen in breast parenchyma.
 D. Color-Doppler sonogram shows vascular flow (arrowhead).
 E. Axial spin-echo T1 weighted MRI shows diffusely thickened low signal dermis and an irregular and lobulated low signal mass (arrows) in parenchyma.

F. Inversion-recovery T2 weighted MRI shows diffusely thickened subcutaneous layer with dilated lymphatics (arrows). Irregularly marginated and spiculated heterogeneously increased signal intensity mass (open arrows) with necrotic and fluid retained cystic portion (arrowhead) which suggested distended lobular structure in parenchymal layer.

G. Precontrast axial spine-echo T1 weighted image shows thickened low signal dermis and an irregular marginated low signal mass in parenchymal layer (arrows).

H. Axial 3D-GRE dynamic MRI shows diffusely enhancing dermal and subcutaneous layer and an inhomogeneously enhancing spiculated mass in parenchyma (arrows).

2F) T2 (Fig. 66.7%, ,

US 3D-GRE MRI

, US MRI

(1)

3

가

가

T1,T2 MRI

3D-GRE MRI

가

(nipple-areolar

(9).

1-6% 가 (3-8).

(3)

가

48-55 52

가 30 (13).

가

(4)

가

Heywang (5) 5 4

(10-14).

32 가 , 44

가

가

8

3D-

GRE MRI

Stack (15) 3D-GRE MRI

1-2

4

75% 1

(9, 13), US

US

US

(9, 13), 5 (55.6%)

, 4 (44.4%)

가 가

(14).

가

가

US
MRI
US

US MRI

US

3D-GRE MRI

가

MRI

1. Dash N, Lupetin AR, Daffner RH, Deeb ZL, Sefzeck JR, Schapiro RL. Magnetic resonance imaging in the diagnosis of breast disease. *AJR* 1986; 146:119-125
2. Heywang SH. *Contrast enhanced MRI of the breast*. Germany : Schering, 1990:11-18

3. Gd-DTPA 1995;32:173-180
4. 1997;37: 757-762
5. Heywang SH, Wolf A, Pruss E, Hilbertz T, Eiermann W, Permanetter W. MR imaging of the breast with Gd- DTPA: use and limitation. *Radiology* 1989;171:95-103
6. Kaiser WA, Zeitler E. MR imaging of the breast : fast imaging sequence with and without Gd- DTPA. *Radiology* 1989;170:681-686
7. Revel D, Brasch RC, Paajanen H, et al. Gd-DTPA contrast enhancement and tissue differentiation in MR imaging of experimental breast carcinoma. *Radiology* 1986;158 : 19-32
8. EL Yousef SJ, O 'Connell DM, Duchesneau RH, Smith MJ, Hubay CA, Guyton SP. Benign and malignant breast disease : magnetic resonance and radiofrequency pulse sequence. *AJR* 1985;1985; 145:1-8
9. Jackson VP, Jahan Reza, Fu YS. *Infections of the breast*. In Bassett LW, Jackson VP. *Diagnosis of the disease of the Breast*. Philadelphia : Saunders, 1997; 382-385
10. Glass JL, Frazee RC. Inflammatory Breast Cancer. *Am Surg* 1994; 121-124
11. Jaiyesimi IA, Buzdar AU, Hortobagyi G. Inflammatory breast cancer : a review. *J Clin Oncol* 1992;10:1014-1024
12. Donegan WL, Spratt JS. *Cancer of the Breast*. Philadelphia : Saunders, 1997;162-164
13. Kopans DB. *Breast imaging*. Philadelphia : Lippincott-Raven, 1998;403-571
14. Madjar H. Teubner J, Hackeloer BJ. *Breast ultrasound update*. Basel, Karger, 1994;214-219
15. Stack JP, Redmond OM, Codd MB, Dervan PA, Ennis JT. Breast disease : tissue characterization with Gd-DTPA enhancement profiles. *Radiology* 1990;174:491-494

Comparison of Imaging Diagnosis of Pyogenic Abscess and Inflammatory Cancer in the Breast : Focused on MRI¹

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Purpose : To compare the radiologic findings of pyogenic abscess(PA) and inflammatory cancer(IC) of the breast, as seen on mammograms, US, and MR images and to evaluate the usefulness of the differential diagnostic findings of MRI for differentiation of PA and IC of the breast.

Materials and Methods : We retrospectively analyzed the mammographic, US and MR findings of nine histopathologically proven cases of PA and four cases of IC of the breast. Parenchymal density, mass density, skin thickening and calcification were evaluated by mammography, and the extent of lesion and its morphologic characteristics and changes of dermal lymphatics by US and MRI. The latter was also used to analyse signal intensity and enhancement pattern.

Results : Mammographic findings for both lesions were non-specific. US showed that the pyogenic abscess was a hypoechoic and anechoic complex lesion with posterior acoustic enhancement, while inflammatory cancer was a spiculated lesion with a heterogeneous hypoechoic echotexture. On 3D-GRE dynamic enhanced MRI, PA was shown in six cases(66.7 %) to be a lesion with superficial periareolar involvement, in contrast to the deep parenchymal spread seen in all cases of IC. A central non-enhanced portion with an irregular thick peripheral enhanced rim was seen in eight cases of PA(88.9 %) , and in all cases of IC an inhomogeneously enhanced spiculated lesion in parenchyma and a diffusely enhanced dermal and subcutaneous layer was apparent. An MRI time-intensity curve showed that the enhancement pattern was slow in five cases of PA(55.6 %) and irregular in four(44.4 %), while for IC it was rapid in three cases(33.3 %) and irregular in one(11.1 %).

Conclusion : As compared with mammography and US, 3D-GRE dynamic MRI was a useful method for the differential diagnosis of PA and IC of the breast. The characteristic MR findings of PA were a central non-enhanced portion with an irregularly thick peripheral enhanced rim, located mainly in the superficial periareolar area and spreading into the parenchymal layer. An inhomogeneously enhanced spiculated solid mass in the parenchyma associated with diffuse dermal thickening and lymphatic dilatation was more suggestive of IC.

Index words : Breast neoplasms, diagnosis

Breast, diseases

Breast, MR

Breast, US

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