

: , 5 (23-49 , 37)
 , , , 4
 : , 1
 가 가 4 3
 , 가 ,
 , 가 .3
 가 가 가
 1 , 가 가
 : , 가 ,
 가
 Senographe 500 T
 (CGR, France) Senographe DMR (GE, Milwaukee,
 Wisconsin) ATL HDI 3000
 (Advanced Technology Laboratories, Bothell, Wash., U.S.A.)
 7.5 MHz 16 G
 (1-2).
 (3-5).
 (6-9). (6, 10). (n = 2),
 (n = 3) 가
 (estrogen receptor,
 ER), (progesterone receptor, PR) gross
 cystic disease fluid protein - 15 (GCDFP - 15)
 5 , , 4
 23-49 , 37 , 1

1
2
3

1
Table 1

4

49

가 가

Table 1. Summary of Five Patients with Primary and Metastatic Signet Ring Cell Carcinoma of the Breast: Clinical and Radiologic Findings

No [#]	Age	Location	Symptom	Duration (months)	ER /PR	GCDFP - 15	Mammographic Findings	Sonographic Findings
1	49	Lt.	Palpable mass	2	+ /+	+	Asymmetric density	mass
2	41	Lt.	Breast enlargement	4	- /-	-	Diffuse increased density	Diffuse skin thickening, increased SQ echogenicity
3	23	Rt.	Breast enlargement	4	- /-	-	Diffuse increased density	Diffuse skin thickening, increased SQ echogenicity
4	36	Lt.	Breast enlargement	5	- /-	-	Diffuse increased density	Diffuse skin thickening, increased SQ echogenicity
5	38	Lt.	Palpable mass	3	- /-	-	No abnormality	mass

1 : primary signet ring cell carcinoma, 2 - 5 : metastatic signet ring cell carcinoma from stomach,
Lt : left, Rt : right, SQ = subcutaneous

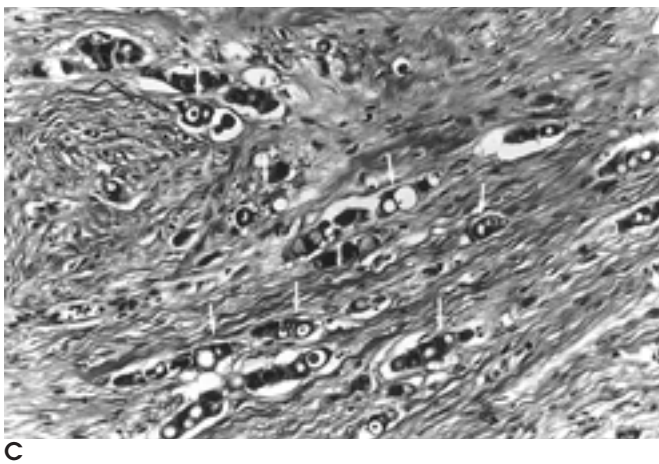
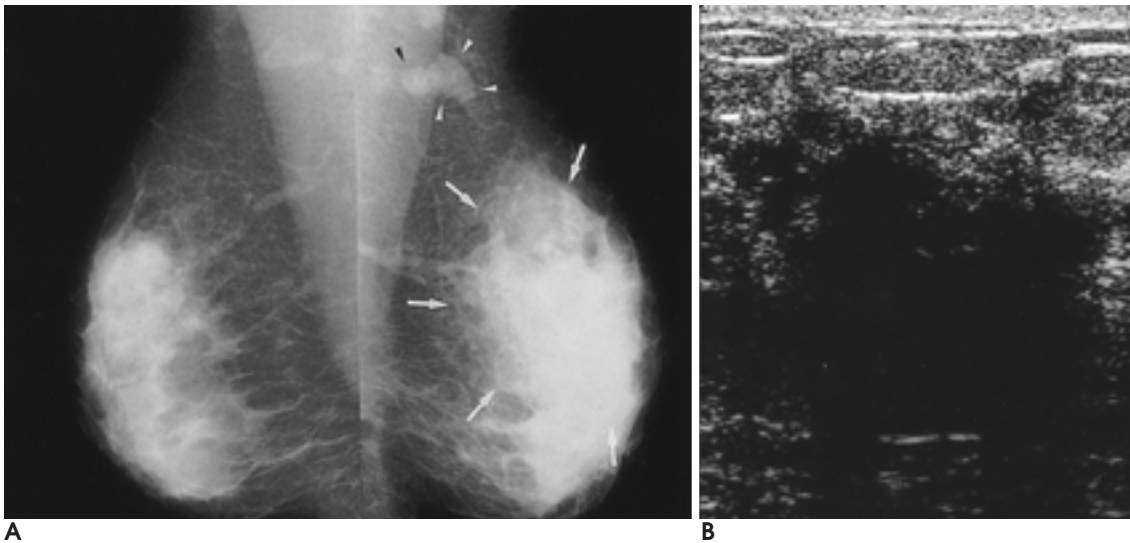


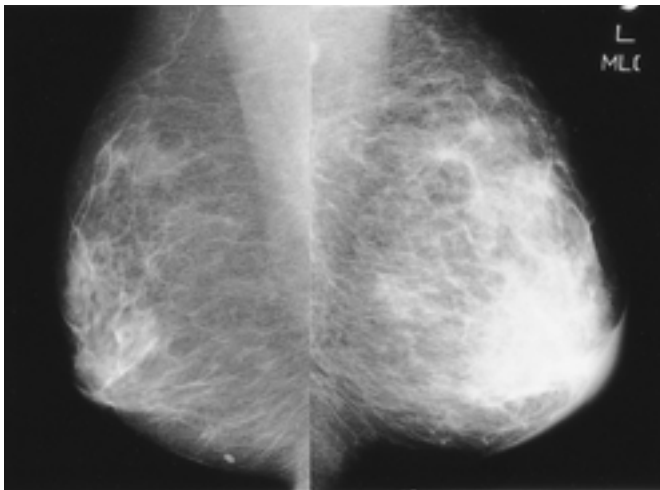
Fig. 1. 49-year-old woman with primary signet ring cell carcinoma.

A. Both mediolateral oblique (MLO) mammograms show asymmetric increased density in the upper portion of the left breast (arrows) and lymph node enlargement (arrowheads) in the axilla.

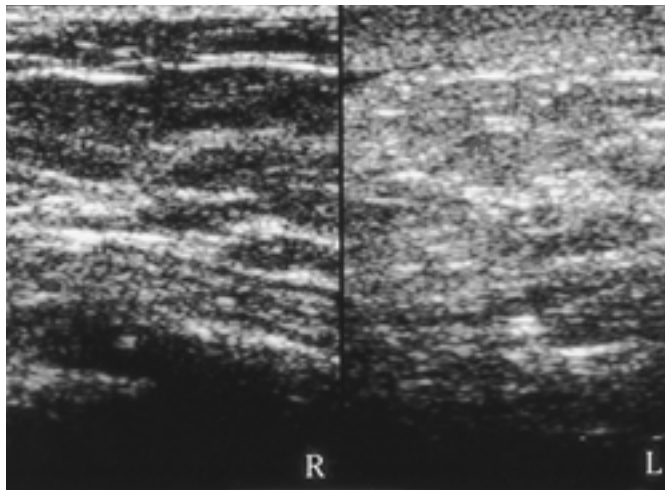
B. Ultrasound shows an 4 × 3 cm ill-defined hypoechoic mass with irregular margin and heterogenous posterior shadowing.

C. Photomicrographic findings of breast specimen (H & E, x 200) shows infiltration of signet ring cells (arrows) which has eccentric, semilunar nuclei and cytoplasmic vacuoles. Endoscopic examination was negative.

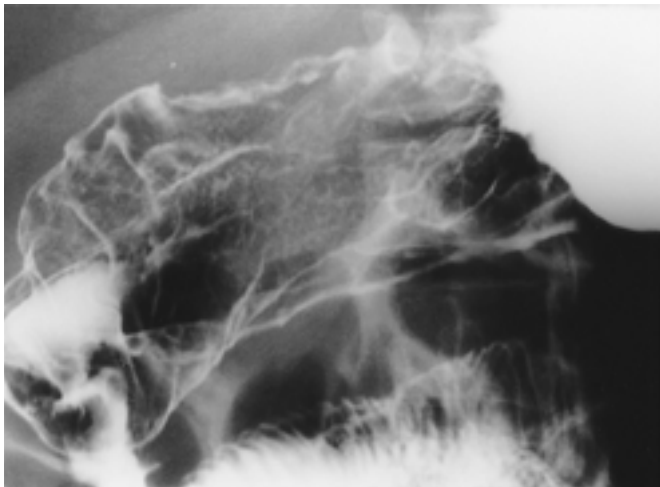
(Fig. 1A). 가
 가 , 4×3 cm , 가
 (Fig. 1B). 가
 가 (Fig. 1C). ER, PR,
 GCDFP - 15
 23 - 41 , 34
 3 , 1 4
 가 3 가
 가 (Fig. 2A, B). 1
 가 . 3
 가 1 3
 가 (Fig. 3A), 가
 가 가 ,
 가 가
 가 (Fig. 3B, C).
 1 cm 1.8 cm 가
 5 mm 2 - 3 (Fig.
 3D).



A



B



C

Fig. 2. 41-year-old woman with metastatic signet ring cell carcinoma.
A. Both mediolateral oblique mammograms show diffuse increased density with fascial thickening, retroareolar haziness, and periareolar skin thickening in the left breast.
B. On ultrasonogram, left breast shows diffuse skin thickening and increased echogenicity of subcutaneous fat layer (L). In contrast to this, right breast shows normal pattern (R).
C. UGI shows ulceroinfiltrative mass in lesser curvature of the stomach.

4
 15 ER, PR GCDFP - 3 ER PR 가 (12).
 (Fig. 2C).
 , Cavazzini (3)
 가 가 (10)
 8.7% mucicarminophilic 가 20% (1, 11).
 가 (1 - 2). 4 3

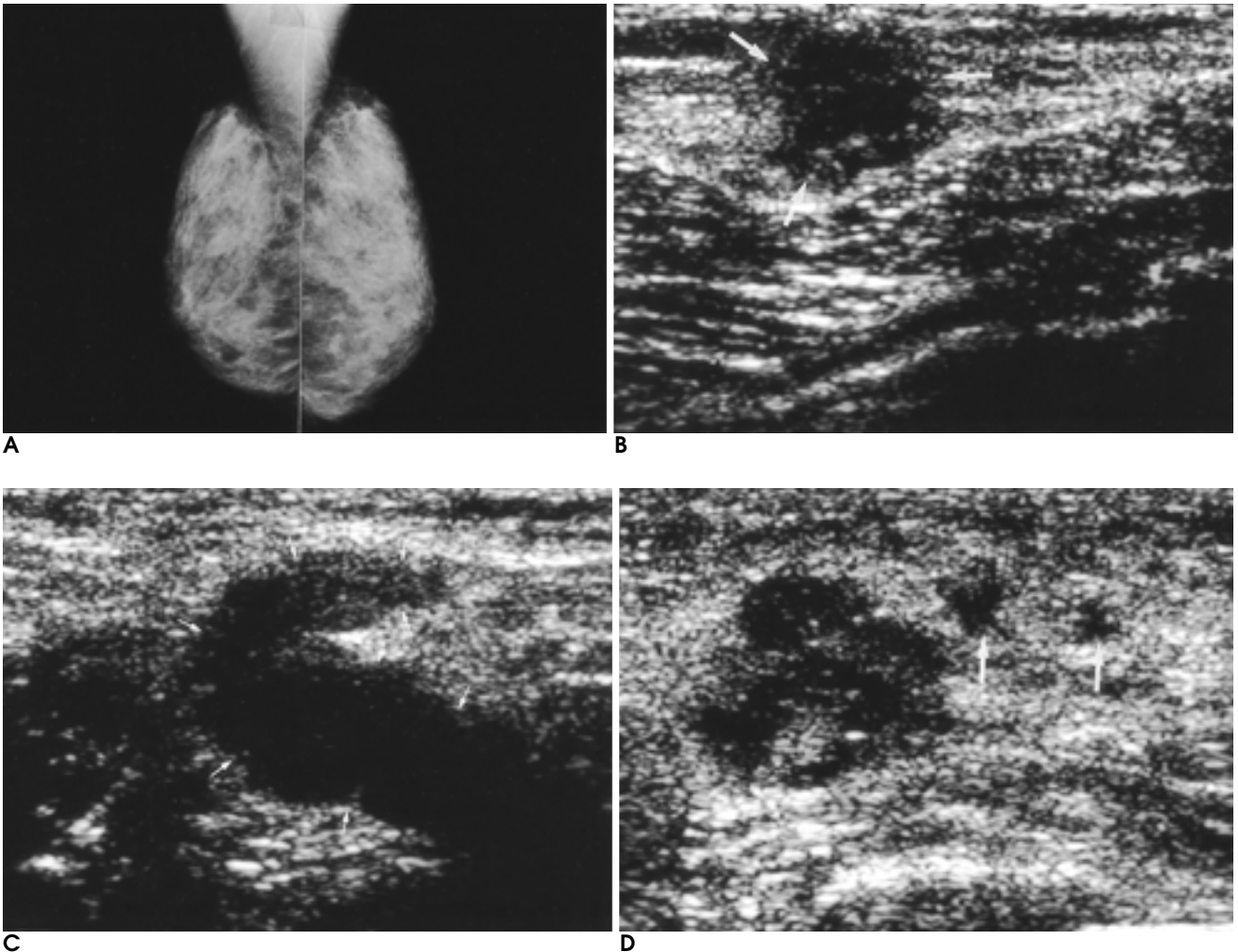


Fig. 3. 38-year-old woman with metastatic signet ring cell carcinoma.
A. Both mediolateral oblique mammograms show diffuse dense breast patterns with no definite evidence of mass.
B. Ultrasonogram of the left breast shows 1 cm ill-defined hypoechoic mass without posterior shadowing or enhancement (arrows).
C. Ultrasonogram of the left axilla shows enlarged hypoechoic lymph nodes with absence of central echogenic hilum (arrows).
D. Follow-up ultrasonogram of the left breast obtained 1 month later shows 1 cm to 1.8 cm increase in size of the mass and newly developed adjacent several hypoechoic nodules (arrows).

1.2 - 6.6%
 (6, 7).
 (6 - 9),
 가
 가
 (10).
 4 3
 가
 가
 가
 가
 가 (13 - 14).
 가
 (15).
 34
 가 1 80%
 (16).
 가
 (16),
 (12).
 (linitis plastica) 가 (12).
 ER
 가 (17)
 23% ER
 GDCFP - 15
 가
 (12),
 4
 PR, ER, GCDFFP - 15

1. Steinbrecher JS, Silverberg SG. Signet-ring cell carcinoma of the breast. The mucinous variant of infiltrating lobular carcinoma? *Cancer* 1976;37:828-840
2. Fechner RE. Infiltrating lobular carcinoma without lobular carcinoma in-situ. *Cancer* 1972;29:1539-1545
3. Cavazzini G, Colpani F, Cantore M, Aitini E, et al. Breast metastasis from gastric ring cell carcinomas, mimicking inflammatory carcinoma. A case report. *Tumori* 1993; 79:450-453
4. de la Cruz Mera A, Marino Cotelao A. Breast metastases. *Acta Cytol* 1998;42:1304-1306
5. Domanski HA. Metastases to the breast from extramammary neoplasms : a report of six cases with diagnosis by fine needle aspiration cytology. *Acta Cytol* 1996;40:1293-1300
6. Derchi LE, Rizzato G, Giugeppetti GM, Dini G, Garabenta A. Metastatic tumors in the breast: sonographic findings. *J Ultrasound Med* 1985;4:69-74
7. Yamasaki H, Saw D, Zdanowitz, Faltz LL. Ovarian carcinoma metastasis to the breast case report and review of the literature. *Am J Surg Pathol* 1993;17:193-197
8. Paulus DD, Libshitz HI. Metastasis to the breast. *Radiol Clin North Am* 1982;20:561-568
9. McCrea ES, Johnston C, Haney PY. Metastases to the breast. *AJR Am J Roentgenol* 1983;141:685-690
10. 1998;38:1139-1141
11. Eltorky M, Hall JC, Osborne PT, El Zeky F. Signet-ring cell variant of invasive lobular carcinoma of the breast. *Arch Pathol Lab Med* 1994;118(3):245-248
12. Yim H, Jin YM, Shim C, Park HB. Gastric metastasis of mammary signet ring cell carcinoma--a differential diagnosis with primary gastric signet ring cell carcinoma. *J Korean Med Sci* 1997;12(3):256-261
13. Toombs BD, Kalisher L. Metastatic disease to the breast : clinical, pathologic, and radiographic features. *AJR Am J Roentgenol* 1977; 129:673-676
14. Howarth CB, Caces JN, Pratt CB. Breast metastasis in children with rhabdomyosarcoma. *Cancer* 1980;46:2520-2524
15. Alexander HR, Turnbull AD, Rosen PP. Isolated breast metastases from gastrointestinal carcinomas: report of two cases. *J Surg Oncol* 1989;42:264-266
16. Hajdu SI, Urban JA. Cancers metastatic to the breast. *Cancer* 1972; 29:1691-1696
17. Kojima O, Takahashi T, Kawakami S, Uehara Y, Matsui M. Localization of estrogen receptors in gastric cancer using immunohistochemical staining of monoclonal antibody. *Cancer* 1991;67:2401-2406

Signet Ring Cell Carcinoma of the Breast: Clinical and Radiologic findings¹

Jin-Young Kwak, M.D.², Eun-Kyung Kim, M.D., Ki Keun Oh, M.D., Yong Hee Lee, M.D.³

¹Department of Diagnostic Radiology, Yonsei University College of Medicine

²Department of Diagnostic Radiology, Pundang CHA General Hospital, College of Medicine, Pochon CHA University

³Department of Pathology, Pundang CHA General Hospital, College of Medicine, Pochon CHA University

Purpose: To evaluate the clinical and imaging findings of signet ring cell carcinoma of the breast.

Materials and Methods: We retrospectively evaluated the clinical, mammographic and ultrasonographic (US) findings of five patients aged 23 - 49 (mean 37) years with signet ring cell carcinoma of the breast. Diagnosis involved US-guided core-needle biopsy. In all patients the stomach was evaluated endoscopically after confirmation of the breast lesion. Metastatic breast cancer was confirmed in four patients and primary breast cancer in one.

Results: Three of the four patients with metastatic signet ring cell carcinoma complained of breast pain and swelling or enlargement. Mammography indicated the presence showed of diffuse increased density and skin thickening, without calcifications, while US demonstrated diffuse marked skin thickening, lymphatic dilatation, and axillary lymph node enlargement. Neither modality revealed the presence of mass, however. In the remaining patient, an enlarged breast mass was observed; mammography showed no abnormality, but US revealed an ill-defined hypoechoic mass. Mammographic and US findings in the patient with primary signet ring cell carcinoma of the breast indicated an ill-defined spiculated mass, resembling other breast carcinomas.

Conclusion: Metastatic signet ring cell carcinoma of the breast showed clinical symptoms similar to these seen in inflammatory breast cancer, though the former condition occurred in younger women. Radiographs demonstrated diffuse increased density and skin thickening without associated microcalcifications or mass.

Index words : Breast neoplasm, diagnosis
Breast neoplasm, US
Breast neoplasm, metastases

Address reprint requests to : Eun-Kyung Kim, M.D., Department of Diagnostic Radiology, Yonsei University College of Medicine
134 Shinchon-Dong, Seodaemun-gu, Seoul 120-752, Korea.
Tel. 82-2-361-5837 Fax. 82-2-393-3035 E-mail: ekkim@yumc.yonsei.ac.kr