

반지세포 위암의 유방 전이: 증례 보고

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Metastatic Signet Ring Cell Carcinoma to the Breast: A Case Report

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Metastasis of signet ring cell gastric carcinoma to the breast is extremely rare. The common clinical findings are redness, edematous skin and pain, and these findings are similar to those of inflammatory breast cancer. We describe here a case of metastatic signet ring cell gastric carcinoma to the bilateral breasts, and this presented as bilateral palpable breast lumps after the patient had undergone radical total gastrectomy two years previously.

Key words : Signet ring cell carcinoma; Stomach; Breast; Malignancy; Metastasis

Introduction

Metastatic tumor to the breast is a rare phenomenon. The incidence of metastatic carcinomas to the breast is reported to be 0.4% to 5.1% of all non-mammary carcinomas in the breast [1] and 1.7% to 6.6% in an autopsy series [2]. The most common sources of metastatic breast cancer are melanoma and lymphomas, followed by carcinomas of the lung, ovary, kidney, stomach, oropharynx and carcinoid tumors [3]. Among them, metastasis of signet ring cell gastric carcinoma to the breast has been reported to be extremely rare [4].

We experienced a case of metastatic signet ring cell gastric carcinoma to the bilateral breasts, and this presented as bilateral palpable breast lumps after the patient had undergone radical total gastrectomy two

years earlier.

Case Report

A 71-year-old woman came to our hospital with newly developed palpable lumps in the upper outer portion of the bilateral breasts and right nipple retraction at the time of March 2011. This patient had undergone robot-assisted radical total gastrectomy due to advanced gastric carcinoma of the signet ring cell type in March 2009. The surgical pathology showed tumor invasion into the subserosal layer of the stomach (T2b), and metastatic regional lymph nodes were confirmed (N1). After surgery, the patient received adjuvant chemotherapy treatment for 6 months.

In March 2011, the patient presented with palpable lumps in the bilateral breasts. A mammogram

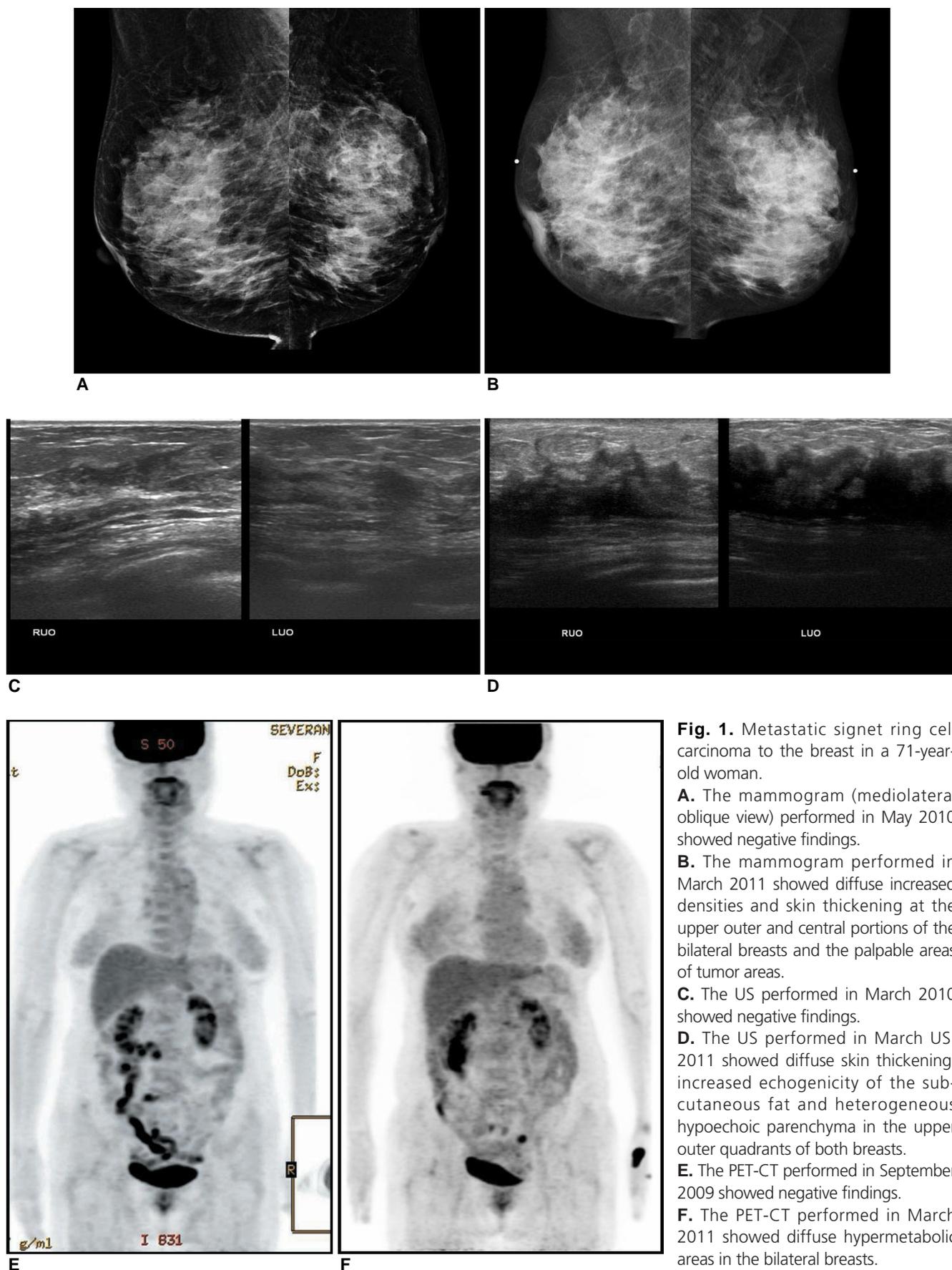


Fig. 1. Metastatic signet ring cell carcinoma to the breast in a 71-year-old woman.
A. The mammogram (mediolateral oblique view) performed in May 2010 showed negative findings.
B. The mammogram performed in March 2011 showed diffuse increased densities and skin thickening at the upper outer and central portions of the bilateral breasts and the palpable areas of tumor areas.
C. The US performed in March 2010 showed negative findings.
D. The US performed in March 2011 showed diffuse skin thickening, increased echogenicity of the subcutaneous fat and heterogeneous hypoechoic parenchyma in the upper outer quadrants of both breasts.
E. The PET-CT performed in September 2009 showed negative findings.
F. The PET-CT performed in March 2011 showed diffuse hypermetabolic areas in the bilateral breasts.

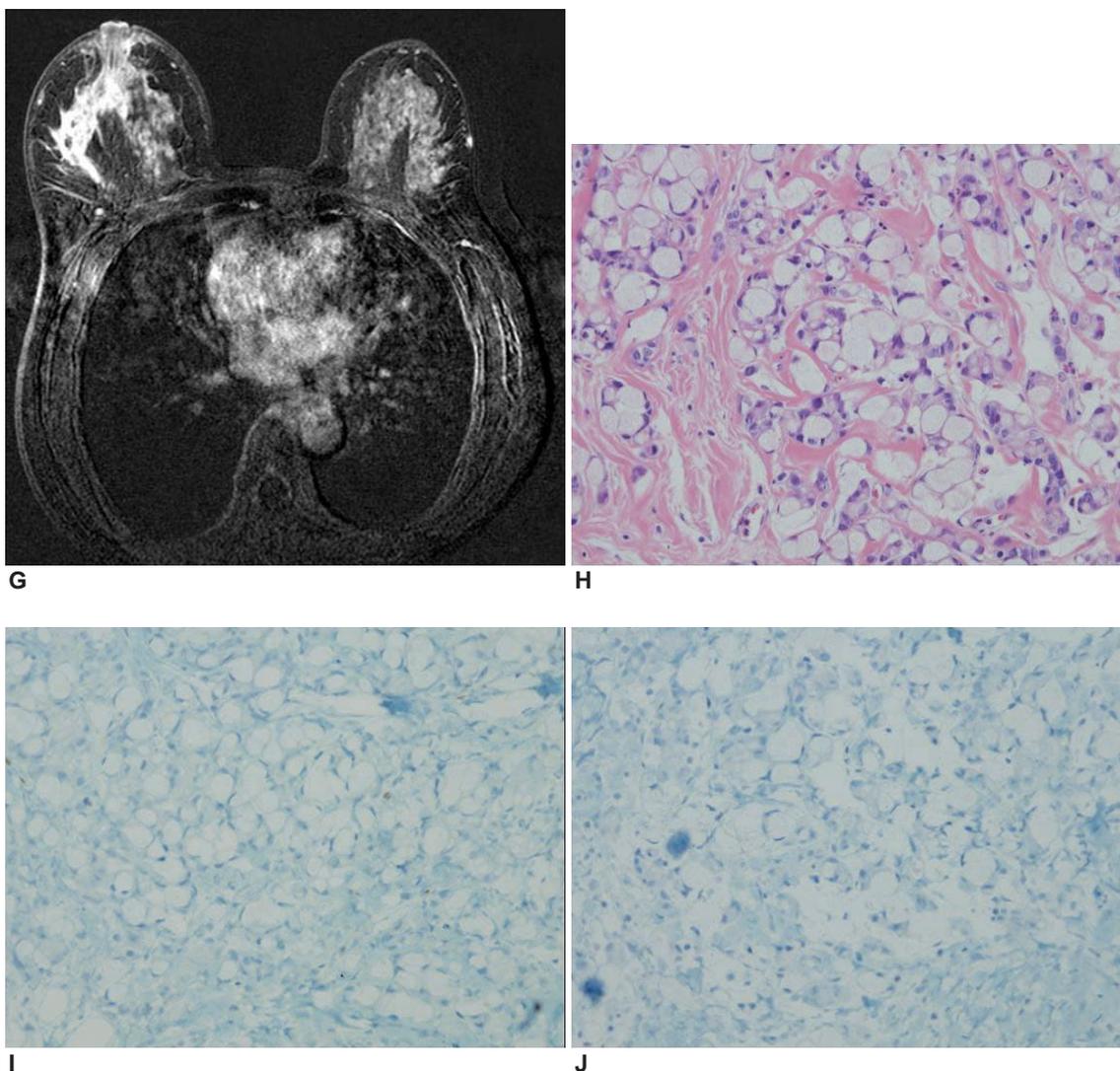


Fig. 1. G. There is diffuse, non-mass like, homogeneous enhancement of the right breast, and especially in the upper outer portion and there was non-mass like heterogeneous enhancement of the left breast seen on the subtraction image.
H. The breast pathology shows invasion of neoplastic cells with signet-ring feature into the breast parenchyma. (Hematoxylin & Eosin stain, $\times 200$).
I, J. The immunohistochemical staining is negative for estrogen receptor (**I**) and GCDFP-15 (**J**).

performed in March 2011 showed newly developed diffuse increased densities in the upper outer and central portions of the bilateral breasts at the palpable sites and also skin thickening, as compared to the negative mammogram obtained 10 months earlier (Fig. 1A and 1B). However, other suspicious features such as calcifications or enlarged axillary lymph nodes were not seen. Compared to the negative finding on ultrasonography (US) in May 2010, the US performed in March 2011 showed newly developed skin thickening, increased echogenicity of the subcutaneous fat and diffuse, heterogeneously

hypoechoic parenchyma involving the palpable areas of the upper outer and central portions of the bilateral breasts (Fig. 1C and 1D). There were no mass lesions detected in the bilateral breasts on US or enlarged lymph nodes in both axillae and the supraclavicular fossae. The positron emission tomography/computerized tomography (PET-CT) done in September 2009 showed negative findings, but the PET-CT done in April 2011 showed diffuse hypermetabolism in the bilateral breasts (Fig 1E and 1F). Breast magnetic resonance image (MRI) showed diffuse, non-mass like, homogeneous enhancement in

the upper outer, central and medial portions of both breasts. Metastatic lesions asymmetrically involved both breast. Associated skin thickening was seen on the right breast (Fig. 1G).

Vacuum-assisted biopsy with an 8-gauge needle was performed on the upper outer quadrants of the bilateral breasts. The biopsy specimens showed invasion of neoplastic cells with signet-ring feature into the breast parenchyma, which was similar to the findings of the gastrectomy specimen (Fig. 1H. Hematoxylin & Eosin stain, $\times 200$). Immunohistochemical studies showed negative findings for both estrogen receptor (ER) and gross cystic disease fluid protein-15 (GCDFP-15) (Fig. 1I and 1J), and the patient was confirmed as having signet ring cell carcinoma, and this was probably metastatic carcinoma from the stomach.

Discussion

Metastatic involvement of the breast from extramammary malignancies is unusual [4], and this generally occurs in a polymetastatic context [5]. Among them, metastatic signet ring cell carcinoma of the breast arising from the stomach is an extremely rare tumor, and only such 13 cases have been reported [4]. Metastasis to the breast occurs more frequently in a younger age group [4], because the physiologic status of the breast in the younger age group may provide fertile substrate for metastasis [6]. In contrast, our patient was a 71-year-old woman.

The common clinical findings of metastasis to the breasts are redness, edematous skin and pain, which are similarly seen in patients with inflammatory breast cancer [2, 4, 7]. A few cases of metastatic signet ring cell carcinoma of the breast reported palpable nodular lesions without signs of inflammation [4]. Our patient presented with palpability and nipple retraction without signs of inflammation, but the imaging features did not show any mass at the bilateral palpable sites. The most common location of metastatic lesions is the upper-outer quadrant of the breast [4]. Approximately 25% of the reported cases

showed bilateral breast involvement [6]. Our patient also showed metastatic lesions in the upper outer portions of the bilateral breasts.

Metastasis occurs through two routes via lymphatic or hematogenous spread [2]. Pathological tumor cells permeating the lymphatics and blood vessels result in diffuse involvement of the breast, and particularly dermal involvement, which usually means blood-borne metastases [2]. Because metastasis mainly involves the dermal layer, this shows diffusely increased density and skin thickening without definite mass lesions on mammography. Similarly, diffusely increased echogenicity of the subcutaneous fat and skin thickening are common findings seen on US. These findings are similar to those seen in our case and the cases reported by Kwak et al. and Boutis et al. [2, 4].

Metastatic signet ring cell gastric carcinoma to the breast should be differentiated from primary breast signet ring cell carcinoma because the therapeutic implications are definitely different [1]. Moreover, the prognosis of patients with metastasis to the breast is very poor and 80% of these patients die within 1 year of the diagnosis [8, 9]. Although the lack of any in situ component can exclude the primary carcinoma, this is not reliable [1]. Only immunohistochemical stains are helpful to differentiate the primary breast cancer and metastasis to the breast. Metastasis to the breast usually shows negative results for estrogen and progesterone receptors as well as GCDFP-15 [10]. In contrast, lymphatic tumor emboli or epithelial markers such as CK7, CK20 and CEA are usually present [1, 6]. In our case, the immunohistochemical staining was negative for ER and GCDFP-15.

Metastatic signet ring cell carcinoma of the breast is a rare disease and it has non-specific clinical, mammographic and US features. However, even when there are no definite masses or axillary lymphadenopathy, if skin thickening and increased density or echogenicity of the subcutaneous fat is noted on mammography or US, then the possibility of metastasis must be considered.

요 약

반지세포위암의 유방 전이는 매우 드문 질환이다. 알려진 임상적, 영상의학적 소견은 드물지만, 임상적으로 염증성 유방암과 유사한 발적과 부종을 보이며, 유방촬영술에서 미세석회화가 없는 불규칙한 종괴로 나타나는 경우가 보고된 적이 있다. 본 증례는 양측 유방의 만져지는 병변으로 내원한 71세 여자의 반지세포위암의 유방 전이로 유방촬영술에서 종괴 형성이나 미세 석회화 없이 미만성 음영 증가를 보이며, 초음파에서 부종성 변화와 비균질적 에코양상으로 보였다.

References

1. Madan AK, Ternovits C, Huber SA, Pei LA, Jaffe BM. Gastrointestinal metastasis to the breast. *Surgery* 2002;132:889-893
2. Kwak JY, Kim EK, Oh KK. Radiologic findings of metastatic signet ring cell carcinoma to the breast from stomach.

Yonsei Med J 2000;41:669-672

3. Paulus DD, Libshitz HI. Metastasis to the breast. *Radiol Clin North Am* 1982;20:561-568
4. Boutis AL, Andreadis C, Patakiouta F, Mouratidou D. Gastric signet-ring adenocarcinoma presenting with breast metastasis. *World J Gastroenterol* 2006;12:2958-2961
5. Krichen Makni S, Abbes K, Khanfir A, Frikha M, Sellami Boudawara T. Metastatic signet ring cell carcinoma to the breast from stomach. *Cancer Radiother* 2007;11:276-279
6. Alexander HR, Turnbull AD, Rosen PP. Isolated breast metastases from gastrointestinal carcinomas: report of two cases. *J Surg Oncol* 1989;42:264-266
7. Cavazzini G, Colpani F, Cantore M, et al. Breast metastasis from gastric signet ring cell carcinoma, mimicking inflammatory carcinoma. A case report. *Tumori* 1993;79:450-453
8. Amichetti M, Perani B, Boi S. Metastases to the breast from extramammary malignancies. *Oncology* 1990;47:257-260
9. McCrea ES, Johnston C, Haney PJ. Metastases to the breast. *AJR Am J Roentgenol* 1983;141:685-690
10. Merino MJ, Livolsi VA. Signet ring carcinoma of the female breast: a clinicopathologic analysis of 24 cases. *Cancer* 1981;48:1830-1837