Breast and ovarian metastatic localization of signet-ring cell gastric carcinoma

Breast metastatic localization from extramammary neoplasms is rare (1.7–6.6% in old autopic series, 1.2–2% in clinical reports and 2.7% in cytological series) [1]. We describe the first case of a metastatic deposit to the breast and ovary from gastric signet-ring cell carcinoma to be reported in the literature.

In March 1999, a 39-year-old woman underwent abdominal hysterectomy, bilateral salpingo-oophorectomy and omental excision because of a right pelvic mass resembling a primary ovarian carcinoma. The pathological examination of the ovarian mass showed the presence of a malignant signet-ring cell carcinoma, Krukenberg type. A subsequent gastroscopy with biopsies disclosed a signet-ring cell carcinoma in the distal stomach. The subject never underwent gastric resection. Several palpable mammary nodules (synchronously bilateral) appeared at the end of March 1999. Three firm, superficial, movable, not tender masses (one in the upper outer and one in the inner lower quadrant of the right breast, one in the inner lower quadrant of the left breast) were observed at admission to our institute (April 1999). At ultrasonography the nodules measured 5, 2.5 and 3.3 cm, respectively. A computed tomography scan of the abdomen suggested a peritoneal dissemination of the tumor. Skin metastases appeared after 6 months of chemotherapy.

The histological examination of the biopsies from the ovary confirmed the initial diagnosis. On gastric biopsies, a primary carcinoma of the antrum, signet-ring cell type, with focal microglandular features and abundant intracellular mucus was observed. The presence of a signet-ring cell carcinoma in the breast was diagnosed by Tru-Cut needle biopsy of the palpable breast lesions (Figure 1). The breast biopsies were composed of irregular clusters of signet-ring shaped cells with a glandular arrangement. Immunostaining was negative for gross cystic disease fluid protein (GCDFP)-15, c-erb-B2, estrogen receptors (ER) and progesterone receptors in biopsies from both the gastric tumor and the ovary and breast localizations, confirming the gastric origin of the tumor and suggesting the diagnostic value of GCDFP-15 in recognizing tumors of breast origin. In fact, primary signet-ring gastric carcinoma shows microglandular aspects and no GCDFP-15 expression [2].

In our patient, the preference of the signet-ring tumor cells to grow in endocrine target organs is intriguing. The patient’s premenopausal hormonal milieu and the gastric cancer histotype could be associated with the development of breast and ovary metastases. In fact, the growth of gastric cancer in young women may be influenced by their natural biological and hormonal circumstances [3]. Recently, it has been demonstrated that the effects of estrogen in gastric cancer may be mediated by ER-β, specifically in signet-ring cell adenocarcinoma [4]. Moreover, luteinizing hormone is suspected to be related to stromal luteinization in Krukenberg’s tumor, based on the possible stromal origin of the signet-ring cells in the ovary, according to the Krukenberg’s original criteria [5].

Finally, in spite of the exceptionally rare presentation of a metastasizing signet-ring cell gastric carcinoma to the breast and ovary, we think that a right definition of the primary tumor is crucial for an adequate treatment.

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Figure 1. Signet-ring cell carcinoma metastatic localization in the breast.
References


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