Breast Metastasis from a Renal Cell Carcinoma

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Metastases to the breast from extramammary tumors are uncommon, but the proper diagnosis is important because the prognosis and treatment differ from those of primary breast cancer. Metastatic renal cell carcinoma to the breast is extremely rare, accounting for 3% of cases [1]. We report an isolated metastasis to the breast from a renal primary carcinoma that occurred 2 years and 10 months after left radical nephrectomy for renal cell carcinoma.

Patient Description
A 55 year old woman was admitted to the hospital for macrohematuria in January 2003. Whole-body computed tomography scan showed an isolated left renal mass, 5.9 cm in diameter, with no evidence of metastatic spread. On 21 January 2003, she had a left radical nephrectomy. Pathological examination demonstrated renal cell carcinoma of the clear cell type [Figure A], grade I-II and focally III; the tumor compressing the renal capsule but not infiltrating through it; and hilar vessels and ureteral surgical margins free of tumor. Follow-up by the surgeon disclosed no signs of any local recurrence or distant metastases until November 2005 when a routine mammography showed a solid mass in the right breast. Ultrasound examination confirmed a lesion of 6 mm in diameter. Biopsy showed metastatic renal cell carcinoma.

Further systemic evaluation followed. Whole-body bone scan with 99 mTc was negative for bone metastatic spread. Repeated whole-body CT scans showed a spleen nodule 2 cm in diameter, consistent with hemangioma. The lump was excised on 25 December 2005. Pathology examination showed a focus (0.9 cm in diameter) of metastatic clear cell renal carcinoma [Figure B], with all surgical margins free of tumor. No further treatments were recommended.

Routine follow-up in the oncology clinic after discovery of the mass, including CT scans, mammography and ultrasound, showed no evidence of disease as of September 2007.

Comment
The small number of case reports on this entity in the literature suggests that the breast is a highly uncommon site for metastatic disease. It may, however, become an increasingly frequent finding as patients live longer with malignant diseases [2]. In our case the breast metastasis was the first presentation of disease recurrence.

Metastatic neoplasms to the breast account for 0.5–6.6% of all malignant mammary tumors in autopsy series [2], 0.5–1.3% in clinical reports [3], and 2.7% in cytology series [4]. The most frequent origins of metastasis to the breast in women are malignant melanoma, lymphoma, reticulosarcoma, and lung cancer; and for males, prostate cancer [1]. Renal
tumors metastasizing to the breast are rare, occurring in only 3% of cases [1]. The average age of patients at the time of presentation of breast metastases from extra-mammary primary malignancies is 47 years [4].

Clinically, metastatic lesions in the breast present as painless discrete masses with rapid growth. Metastatic lesions have several features that may be helpful in differentiating them from primary lesions; all of them were present in our patient. The skin is usually not affected, and axillary node involvement is uncommon. Mammogram shows well-circumscribed lesions that lack microcalcifications. Both breasts are equally affected, and bilateral involvement is not rare. Solitary discrete lesions occur in 85% [1].

Although difficult, it is of the utmost importance to determine the nature of a malignant finding in the breast. A preceding history of malignant disease should arouse suspicion of metastatic escape to the breast despite the fact that primary carcinoma of breast is much more common [1,4]. Pathological investigation is the key to making the correct diagnosis. Palliative chemotherapy or radiotherapy rather than radical surgery may be preferred if the breast lesion is recognized as a metastasis and other sites of metastatic spread are found [1,4]. In the case of an isolated lesion, metastasectomy is the treatment of choice. Mastectomy and lymph node dissection are unnecessary. The prognosis is often poor with a life expectancy rarely exceeding one year [5]. In our patient, tumorectomy was performed and 2½ years later the patient is alive with no evidence of disease.

References

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Capsule

Antibodies bind therapeutic T cells to tumor cells

Considerable effort has been made in cancer immunotherapy in elaborating robust T cell responses to tumors. However, focusing a T cell’s attention on its tumor target is difficult, often because tumor cells do not present sufficient distinguishing features from normal human cells for the immune system to detect. Bargou et al. overcame this by using a modified bi-specific antibody that simultaneously binds two different cell surface proteins: one on a killer T cell and one on the target tumor cells – in this case, non-Hodgkin’s lymphoma B cells. By tethering the T cell to its intended target, the modified antibody forces direct killing of the lymphoma cells and, even at very low doses, could achieve measurable, or even complete, regression of cancer in a small number of patients who had proven refractory to existing therapies. Although the durability of this treatment needs careful follow-up, it offers further patient-based evidence that T cell-based immunotherapy may yet offer a viable means of treating cancer in the clinic.

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Capsule

Control of mTOR signaling as possible strategies for therapeutic intervention in cancer

The protein mTOR (mammalian target of rapamycin) is a central player in many human diseases, including cancer and cardiovascular dysfunction, and is the target for major efforts in drug discovery in the pharmaceutical industry. Much is known about signaling mechanisms leading to activation of mTOR, but mechanisms controlling protein turnover are currently unknown. Mao et al. demonstrated that FBXW7, a tumor suppressor protein recently identified as another major target for mutation or loss in human cancers, interacts with and targets mTOR for degradation through the proteasome pathway. Because FBXW7 is a haplo-insufficient human tumor suppressor gene, the data provide insights into the control of mTOR signaling and suggest possible strategies for therapeutic intervention.

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