Synchronous Primary Tumors of Kidney and Breast

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Citation

R Sachdev, S Jain, S Nigam, P Agarwal. *Synchronous Primary Tumors of Kidney and Breast*. The Internet Journal of Urology. 2005 Volume 4 Number 1.

Abstract

Concomitant dual or multiple primary malignancies are very rare. Patients with renal cell carcinoma are at higher risk of developing other tumors at different sites. There is a paucity of literature on dual primary malignancies involving kidney and breast. An elderly female presented with a breast lump and a gradually increasing mass in the left lumbar region. On fine needle aspiration cytology (FNAC), the breast lump was diagnosed as duct carcinoma and the guided FNAC from renal mass was suggestive of renal cell carcinoma. The diagnosis was further confirmed on immunocytochemistry and histopathology. The clinician and cytologist should consider the possibility of concomitant dual or multiple primary tumors in a patient presented with mass lesions at various sites, especially if one of the site is kidney. Appropriate markers will aid the final diagnosis.

Presented as a poster at the XXI Annual Conference of Indian Association of Pathologists and Microbiologists (Delhi Chapter), Delhi, 16th April 2006

INTRODUCTION

The possibility of developing two or multiple different primary tumors is extremely rare and there are only a few published reports.[1,2,3,4,5,6,7] The study of multiple primary malignancies is important as the association of certain malignancies may direct the search for germ line mutations or genetic alterations.[2] Moreover, follow up of the patient can be tailored for detection of recurrence and screening for associated malignancies. Patients with renal cell carcinoma (RCC) are at higher risk for developing other primary tumors; commonest being breast, prostate, colorectal, bladder cancer and Non-Hodgkins lymphoma (NHL). [2, 3] Males having papillary variant of RCC (p RCC) are at an increased risk of subsequent prostate and bladder cancer.[3]

The extensive search of published cytological literature did not reveal any such report to the best of our knowledge. The case is presented for its rarity and probably is the first reported case of synchronous dual primary cancers involving breast and kidney diagnosed on fine needle aspiration cytology (FNAC).

CASE REPORT

A 56year female presented with gradually increasing lump in the left breast over a period of two years with a rapid increase in past four months. However, no axillary lymph nodes were palpable. There was no history of nipple discharge and no family history of carcinoma breast. On examination, the lump was firm and non-tender. On mammography, left breast showed a radiographic density with irregular margins and clustered microcalcifications suggestive of carcinoma breast.

The patient also complained of vague abdominal discomfort, anorexia, weight loss and progressively increasing lump for one year. On examination, a large mass was palpable in the left lumbar region. There was no history of colicky pain, hematuria, and no bladder/bowel complaints. Ulltrasonographic (USG) examination of abdomen showed a large mass in left kidney occupying the upper pole; it was predominantly solid with cystic areas. A provisional clinical diagnosis of malignant tumors in kidney and breast was made with following possibilities; primary tumor of breast/ kidney with metastasis to visa-versa, or metastases to kidney and breast from unknown primary site.

Routine investigations revealed normocytic normochromic anemia with increased hematocrit. FNAC from breast lump was performed; Giemsa stained smears showed scattered and loose cohesive clusters of moderately pleomorphic cells suggestive of duct carcinoma (figure1a). A repeat FNAC from breast lump was done for cell block preparation for immunocytochemistry (IC) by Avidin-biotin complex method (ABC); which included estrogen receptors (ER), progesterone receptors (PR), cytokeratin (CK), vimentin (Vim). The cells stained positive for ER, PR and were

negative for CK, Vim; thus confirming the diagnosis of primary mammary carcinoma.

Figure 1

Figure1a: FNAC breast. Loose cohesive clusters of pleomorphic cells. Giemsa x 400

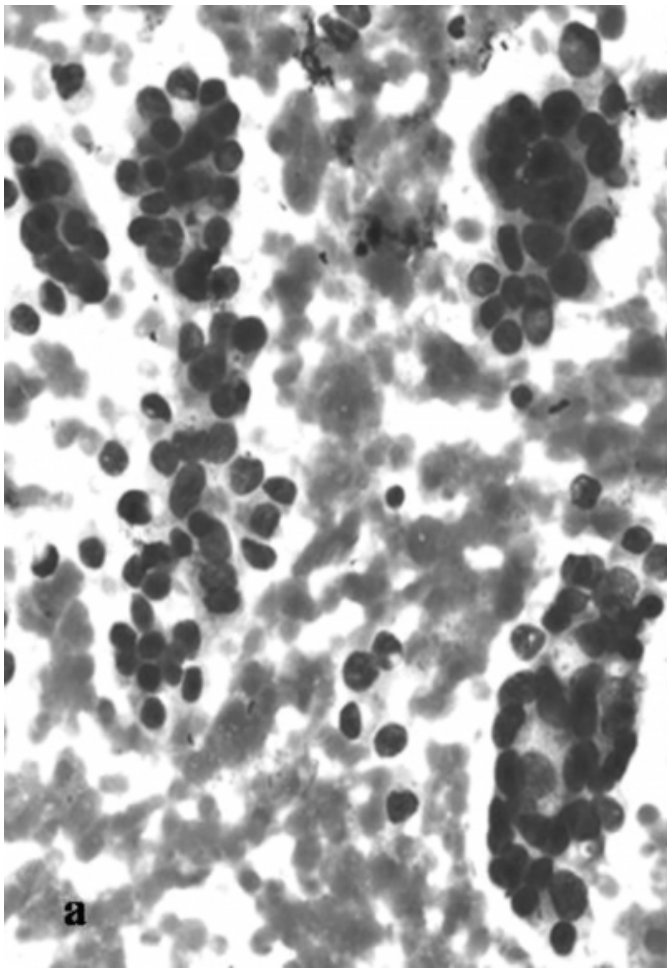
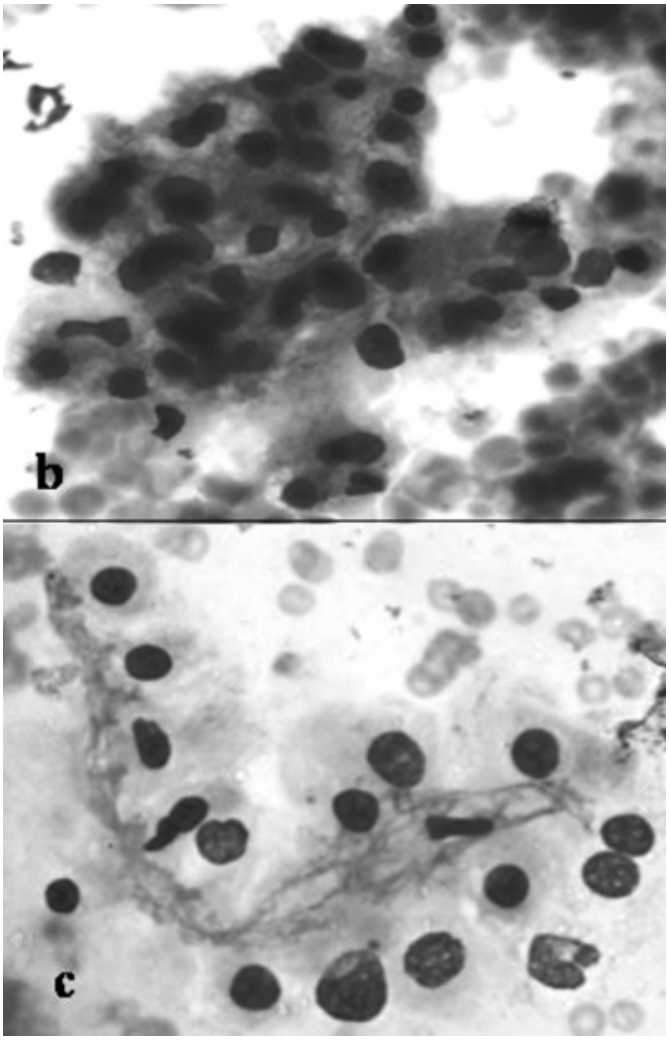


Figure 2

Figure 1bc: FNAC renal mass. Clusters of cells with granular and clear cytoplasm. Giemsa x 400



Meanwhile, a USGguided FNAC from the renal mass was also performed; cytology smears showed morphology entirely different from that of breast lump. The smears showed predominantly large cells, which were present as dissociated, in clusters as well as in perivascular pattern. These cells had abundant granular and clear cytoplasm and prominent large nucleoli in most cells (figure 1b, c); suggested the diagnosis of RCC. A left nephrectomy was carried out. On gross examination, the kidney was replaced by a large tumor occupying mainly the upper pole, measuring 3x2 cms in size, on cut section the mass was partly solid-cystic, with areas of hemorrhage and necrosis; there was no area of capsular or renal vein invasion was seen (figure 2a).Sections from tumor mass showed large cells in acinar and tubular pattern with abundant clear cytoplasm (figure2 b), leading to a diagnosis of RCC (clear cell type). The tumor cells were positive for Periodic-Acid-Schiff stain

(PAS) and also for CK and Vim on IC. Based on the clinical-radiological, cytological and histopathological findings, a final diagnosis of synchronous primary mammary carcinoma and RCC was entertained.

Figure 3

Figure 2a: Nephrectomy specimen. A large tumor with hemorrhage and necrosis is seen in the upper pole

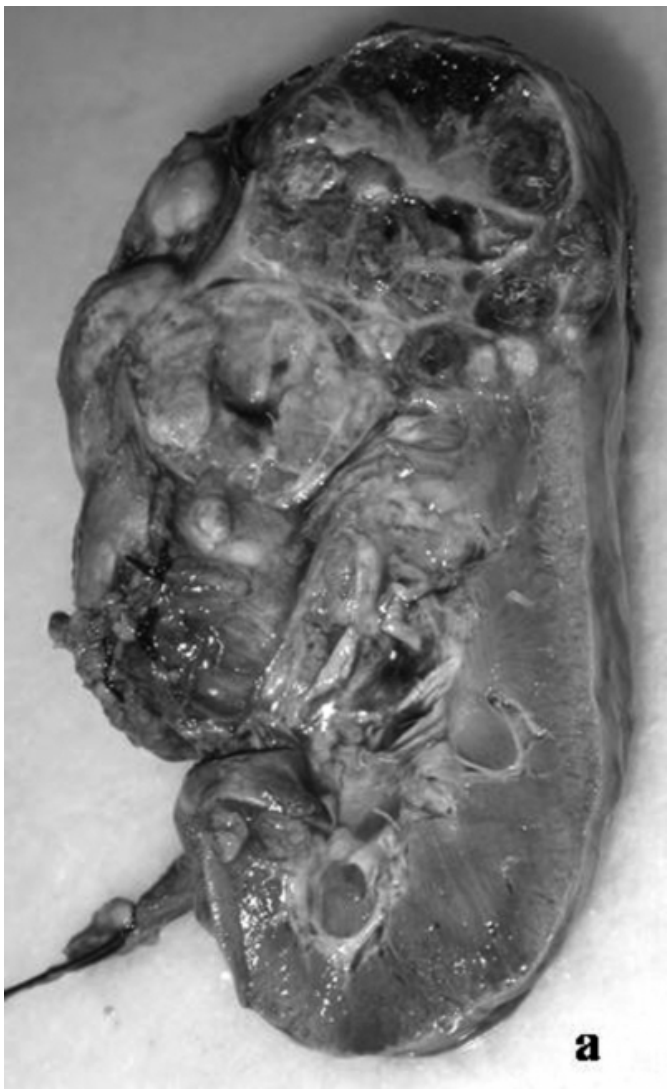
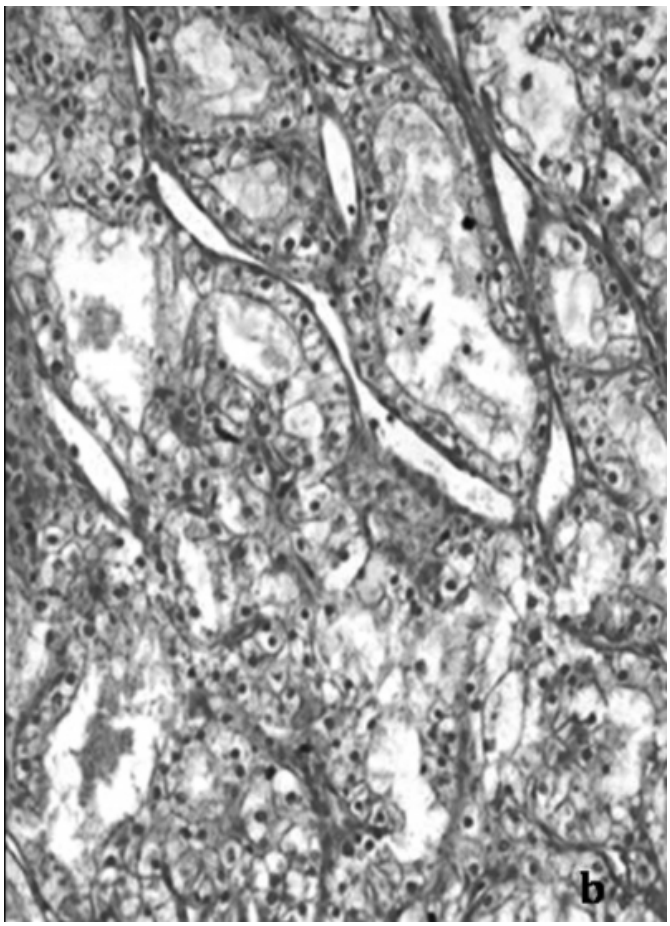


Figure 4

Figure 2b: Paraffin section from renal mass showing tumor cells with clear cytoplasm. Haematoxylin and Eosin x 300



DISCUSSION

Dual primary tumors was first described by Billroth in 1889.[1] The presence of a second primary tumor is described as antecedent, synchronous and metachronous by evaluating the interval between the discoveries of the different neoplasms[4]. There are few reports in literature where the association of RCC with malignancies at various sites has been described; these tumors are of breast[2], colon[2], rectum[2], stomach[5], prostate[2], bladder[2], endometrium[1], ovary[1], nasopharynx[5], lung[6] and others e.g. NHL[2], hematological malignancies (malignant melanoma[4], Waldenstroms macroglobulinemia[5], AML M4[6]).

The role of estrogens is proposed for RCC associated with other primary tumors involving steroid hormone target tissues (breast, endometrium and ovary) [1]. Banerjee et al[7] reported that estradiol induces the development of micronuclei and aneuploidy in hamster renal tissues. Estrogens can potentiate the development of tumors by different action; a) it may act like carcinogens that are

capable of forming direct covalent linkage to DNA, b) it can act as promoters of other carcinogens, c) it may have a permissive influence on growth factors.[1] The existence of specific receptors for estrogen and progesterone has been demonstrated in cases of human RCC[1]; however our case did not show estrogen positivity in RCC. Risk of RCC is increased with the number of births and decreased with increasing age at menarche and increasing age of first birth. Age at menopause or estrogen replacement therapy was unrelated to the risk of developing RCC[1].

The proposed factors that increase the risk of other malignancies in RCC could be as follows; due to a common carcinogenic exposure such as tobacco or alcohol, germ line mutations of p53 as seen in Li Fraumeni syndrome, Beckwith Wiedeman syndrome or side effects of radiotherapy and chemotherapy[3].

There are few published reports of these cases where the diagnosis was entertained on histopathology; the cytological literature is scanty.[1,2,3,4,5,6,7] In the present case, initially the clinical diagnosis was not very clear of diagnosis, although radiological diagnosis insisted on neoplastic lesions in presence of mass lesions at both the sites. However, cytological features from both lumps were quite characteristics of different tumors and this helped us in suggesting the rare dual primary tumors at different sites.

To conclude, the clinician and pathologist should keep the possibility of dual or multiple primary malignancies. The cytologist also should consider the possibility of dual or multiple primary tumors in a patient presented with mass lesions at different sites, especially if one of the site is kidney. Appropriate markers and investigations will help in making the final diagnosis. These patients should be followed for a long time for other synchronous and metachronous malignancies.

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