Male Breast Cancer with Ureteral Metastasis: A Case Report

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Case report

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Abstract

Background: Breast cancer is rare in men and there is no report of male breast cancer (MBC) with ureteral metastasis. In this study, we report the first case of MBC with ureteral metastasis.

Case presentation: A 60-year-old man was diagnosed with triple negative breast cancer (TNBC) with lymph nodes metastasis. After surgery, chemotherapy and radiotherapy he was diagnosed with ureter metastasis because of hematuria. This patient took a Precitype gene test (immune index and PAM50) after several lines of treatment and the result indicated that this was a Luminal A subtype case, which was quite different from his immunohistochemical staining. We adjusted his therapeutic regimen according to the genetic test but there was no obvious efficacy and he passed away five months later.

Conclusions: MBC patients with urinary symptoms should be considered for the possibility of metastasis although urinary metastasis in breast cancer is rare. We still need more research and evidence of treatment recommendations for MBC.

Introduction

Male breast cancer (MBC) is a rare disease with an incidence rate less than 1% of that of female breast cancer[1, 2]. On one hand, male patients usually have later onset of disease and more advanced stage than female patients. On the other hand, male patients have lower risk of death from breast cancer than comparable female patients[3]. MBC patients usually have different characteristic and distinct clinical features[4, 5]. However, only few published data were collected from small cohorts of male patients treated at single institutions and most treatment recommendations were from the results of clinical trials that enrolled only women[6], which results that evidence of MBC treatment guideline is insufficient. Common metastasis site of breast cancer includes axillary lymph nodes, lung, liver, bone and brain while ureteral metastasis is very rare[7]. Here we report an interesting male breast cancer case with ureteral metastasis. We present the following case in accordance with the CARE reporting checklist.

Case Presentation

Mr. Lu, was 60 years old when diagnosed with breast cancer(Fig. 1). He had a history of epilepsy and had been taking valproate orally for a long time and there was no family history of breast cancer or any other malignant tumors. He underwent left breast radical mastectomy, axillary and supraclavicular lymph node dissection in October 2016 at local hospital, and pathologic examination indicated this was an TNBC case (T4N3M0, ER, PR and HER-2 negative, Ki-67 40% positive, Grade III). Then he received 8 periods of chemotherapy (epirubicin, cyclophosphamide, and paclitaxel liposome) and 25 periods of radiotherapy.

In August 2017, he found a mass on his left upper arm and doctors performed mass excision for him. After being confirmed of left arm metastasis, he came to our hospital for further treatment. He received chemotherapy for 6 periods (Navelbine and carboplatin) and began oral chemotherapy of capecitabine in April 2018. Unfortunately, the patient was diagnosed with ureter metastasis after middle ureter dissection

and anastomosis because of hematuresis and urinary obstruction (ER, PR and HER-2 negative, Ki-67 50% positive, Fig. 2 and Fig. 3). After 8 periods of chemotherapy with albumin-bound paclitaxe the patient was in poor condition with severe urinary system infection. Genomic test (immune index and PAM50) was taken with his primary breast tumor tissue and the test result showed he was a Luminal A subtype case and RNA expression of HER-2 gene was positive, which was totally different from his first result of immunohistochemical staining. After discussion we gave him endocrine therapy and anti-HER-2 target therapy with aromatase inhibitors, gonadotropin-releasing hormone (GnRH) analogue and trastuzumab. However, it seemed that the treatment did not work and his condition was getting worse and worse and he passed away because of severe infection and multiple organ failure in April 2020.

Discussion And Conclusions

In this study, we introduced the first case of male breast cancer with ureteral metastasis. His immunohistochemical character was rather different from the gene test. Although we adjusted his treatment regiment, this patient still had a poor result.

MBC is rather rare and the risk factors for MBC include demographic factors (black ethnicity, family history of breast cancer), genetic factors (germline genetic mutation, eg, *BRCA1, BRCA2, CHEK2, PALB2)*, environmental factors and diseases associated with hyperestrogenism[6]. However, there was no family history of breast cancer in this case and the genetic test of BRCA mutation was negative. At the same time, no radiation exposure or other diseases reported as risk factors such as liver disease or testicular abnormalities or obesity in this patient. As a result, the exact cause of breast cancer in this patient was unclear and risk factors of MBC should be further studied in the future.

Research data shows that MBC risk has remained at a constant level over the past 40 years[3]. Compared with female patients, male patients have later onset and more advanced disease because of lacking of awareness of early signs of breast cancer and early detection by mammography screening[8]. Although overall survival of MBC is usually worse, male patients actually have a survival benefit after adjustment of life expectancy, age, time of diagnosis, stage and treatment[3, 9]. In our study, the patient was at advanced stage when diagnosed, which leaded to his poor prognosis. In a word, much improvement in outcome of MBC can be achieved by improving earlier detection such as awareness and promotion of breast self-examination and development of therapy guidelines.

Breast cancer commonly metastasis to lymph nodes, lung, liver, bone or brain, and only few cases were reported metastasis to other sites such as intestine or ureter, which may be easily misdiagnosed[7]. In this case, the patient developed a symptom of hematuresis, which was considered urinary tract infection or primary tumors at first. After pathological examination and considering his past history of breast cancer, he was diagnosed with ureteral metastasis and received anti-tumor therapy again. This case reminds us that any patients with urinary symptoms as well as a history of breast cancer should not be easily ruled out of cancer metastasis. Further examinations or even pathologic biopsy is necessary for these patients.

Because there is still no certain evidence such as randomized clinical trials focusing on male breast cancer patients, treatment approaches are extrapolated from studies of treatment for women breast cancer patients[10]. Adjuvant chemotherapy and HER-2 targeted therapy is suggested for MBC patients who are at substantial risk for recurrence and death since observational cohort studies have suggested improved survival among them[11, 12]. Although no randomized trials have evaluated the role of radiotherapy in men, observational studies have suggested a benefit in men with positive nodes after mastectomy[13, 14]. Endocrine therapy is an important part of male breast cancer management since more than 90% breast cancers in men are hormone-receptor-positive[15]. However, in our case, the patient was diagnosed with triple negative breast cancer with ER, PR and HER-2 negative at the first time, which means that he could not benefit from endocrine and anti-HER-2 therapy.

Genomic tests, such as Oncotype DX, or MammaPrint are increasing used to evaluate the recurrence risk and prognosis for women with breast cancer and the likelihood that chemotherapy benefits[16]. Although these genomic tests are usually recommended for early stage patients to calculate a recurrence score and guide the choice of treatment, we still advised this patient to take a Precitype gene test (immune index and PAM50). This is a next generation RNA-Seq genomic test of 55 genes associating with ER related genes, HER-2 related genes, proliferation related genes and Basal related genes and 17 genes associated with immune genes. Genomic test indicated that this was a Luminal A case and the RNA expression of HER-2 was positive. Since his condition was bad and could not tolerate chemotherapy, we adjusted his therapy schedule with aromatase inhibitors plus gonadotropin-releasing hormone (GnRH) analogue and trastuzumab[17, 18]. However, it seemed that it did not work and his condition was getting poorer. Previous research had demonstrated that those patients would have worse prognosis if their PAM50 molecular subtyping is distinct with immunohistochemical subtyping[19], which may explain this patient's poor outcome to some extent. Genomic test such as Oncotype DX is increasingly being used in the management of MBC in clinical practice[20]. However, we need more long-term outcomes data to fully understand the implications of this practice.

We still know very little about MBC at present because of its rather low morbidity rate. More studies about the clinicopathological and immunohistochemical features of MBC should be conducted to build an evidence base that supports future treatment recommendations for this rare disease.

Abbreviations

MBC: Male breast cancer; ER: Estrogen receptor; PR: Progestogen receptor; HER-2: Human epidermal-growth-factor receptor 2; GnRH: Gonadotropin-releasing hormone; BRCA: Breast cancer susceptibility genes.

Declarations

Authors' contributions

Yanbo Chen and Jiannan Wu reviewed the literature and contributed to the manuscript drafting. Fengxi su and Tingting Hu were the patient's attending doctors and contributed to the manuscript drafting. Juanjuan Wang observed the pathological slices. All authors read and approved the manuscript.

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Availability of data and materials

All data generated or analyzed during this study are included in this published article.

Ethics approval and consent to participate

The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

CARE Checklist (2016) statement: The authors have read the CARE Checklist, and the manuscript was prepared and revised according to the CARE Checklist.

Consent for publication

This study was approved by the Medical Ethics Committee of Sun Yat-sen Memorial Hospital, Sun Yat-sen University (SYSEC-KY-KS-2019-152) and with written informed consent of the patient.

Competing interests

The authors declare that they have no competing interests.

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Figures

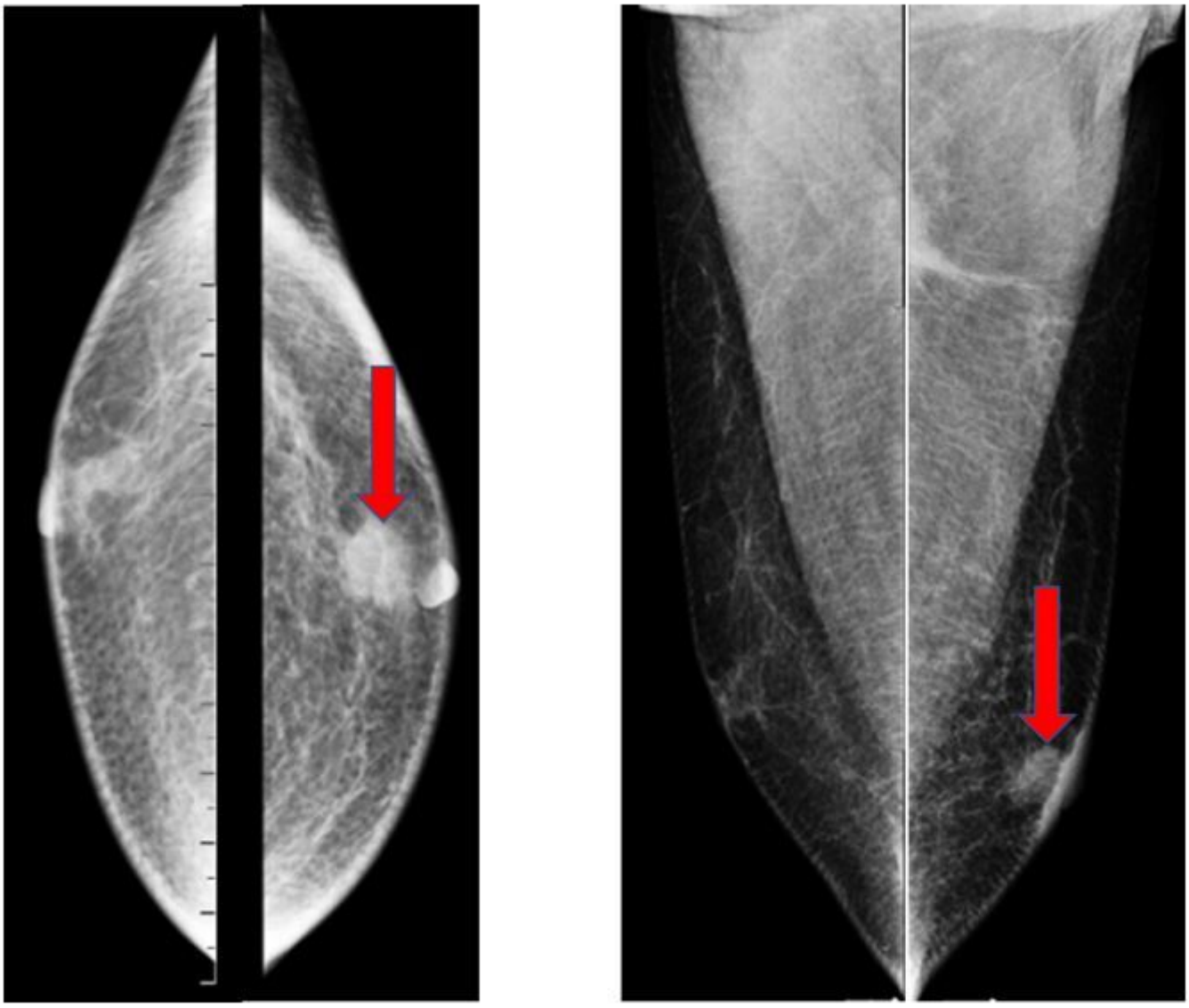

Figure 1

Mammography of the patient. The red arrows indicate lesion in the right breast.

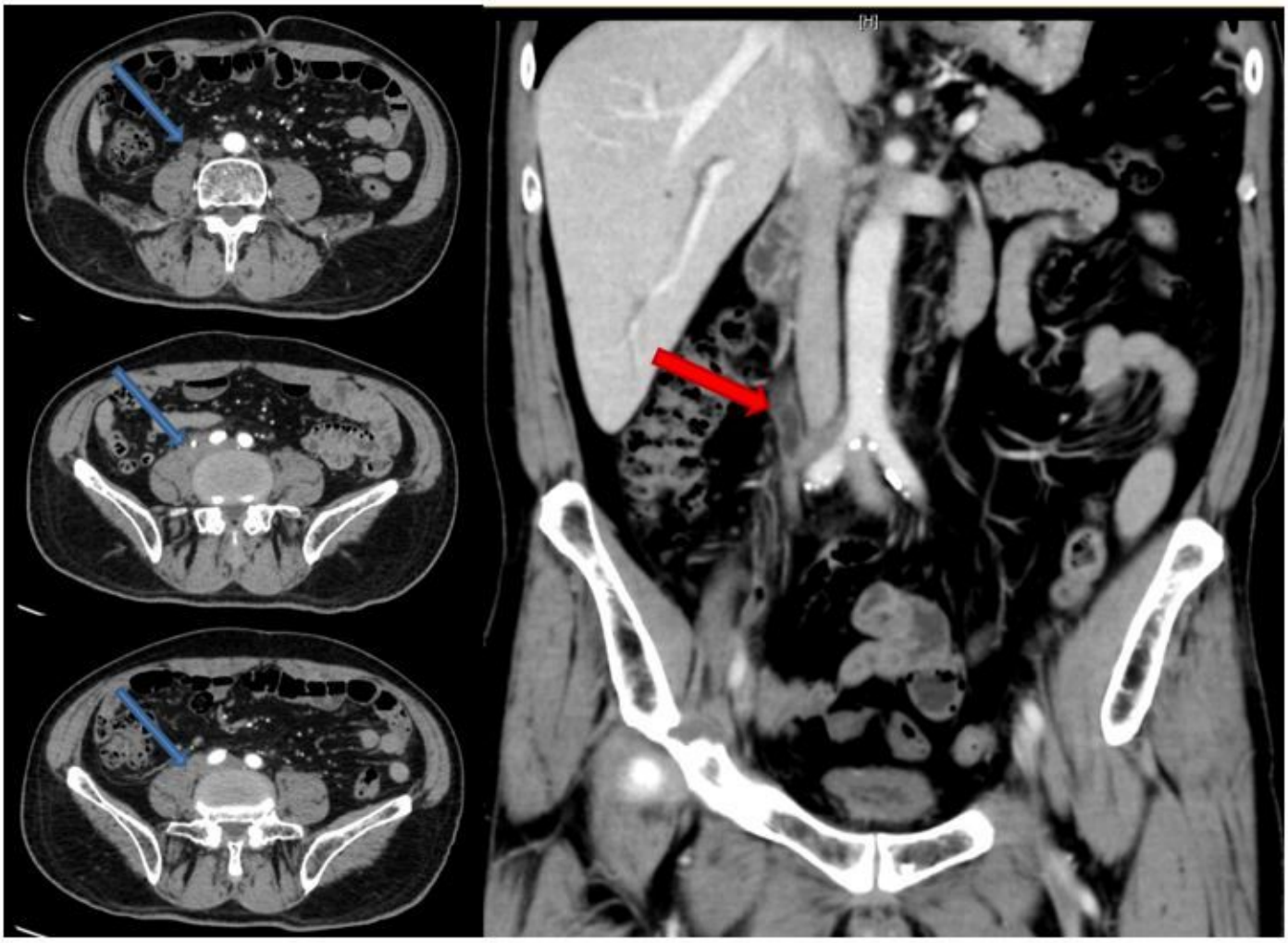

Figure 2

Breast cancer with ureteral metastasis. The blue arrows indicate metastatic region and the red arrow indicates dilated ureter.

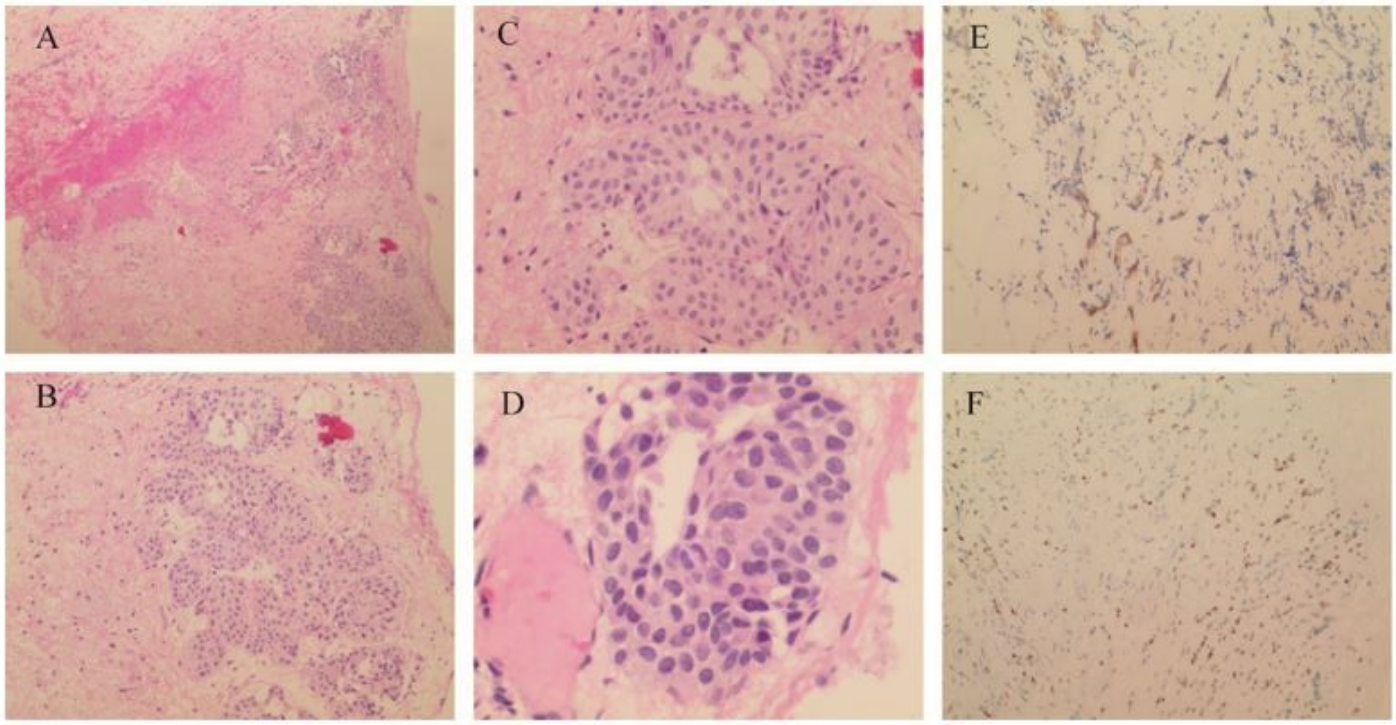

Figure 3

Immumohistochemical staining of the ureteral tissue shows metastasis of breast cancer. A-D: HE staining shows atypical cells in ureter tissue. E: anti-HER-2 staining indicates HER-2 negative expression. F: anti ki-67 staining shows about 50% of cancer cells with positive expression.

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