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## Case Report

# Late breast cancer metastasis to the urinary bladder presenting with bilateral hydronephrosis

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### ABSTRACT

**Introduction:** Since breast cancer is the most common non-skin cancer in women and the second most common cause of cancer death in women, it is important to understand potential sites of metastasis, including rare sites that have not frequently been reported in the literature. As our cancer interventions improve, patients will live longer and we will potentially see unusual patterns of metastatic disease more frequently, as in our case of a woman with breast cancer metastasis to her urinary bladder.

**Case presentation:** We report a case of a 77-year-old female with history of breast cancer, metastatic to bone, and recently diagnosed bilateral hydronephrosis, secondary to a new urinary bladder mass. This mass presented 30 years after her initial cancer diagnosis and biopsy confirmed that the origin was most likely metastatic pleomorphic lobular carcinoma of breast origin.

**Discussion:** This case raises the possibility that unusual patterns of cancer metastasis may become more common, as life expectancy of cancer patients increases. This creates unique diagnostic and management challenges for radiologists and all members of the health care team.

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## Introduction

Breast cancer is the most common type of nonskin cancer in women in the United States and the second most common cause of cancer death in women [1]. Despite advances in therapy and detection, metastasis of breast cancer is relatively common and metastatic disease, particularly distant metastases, is the leading cause of death in breast cancer patients [2]. Breast cancer metastasis to lymph nodes, bone, brain, liver, and lungs are the most common [1,2]. Many metastatic cases have been documented and decades of research have followed

the diverse pathophysiology of metastasis to the common locations. However, there are very few cases reported of breast cancer metastasizing to the urinary bladder [3,4]. There are even fewer cases reports which discuss the challenges in diagnosing and treating this uncommon presentation.

## Case presentation

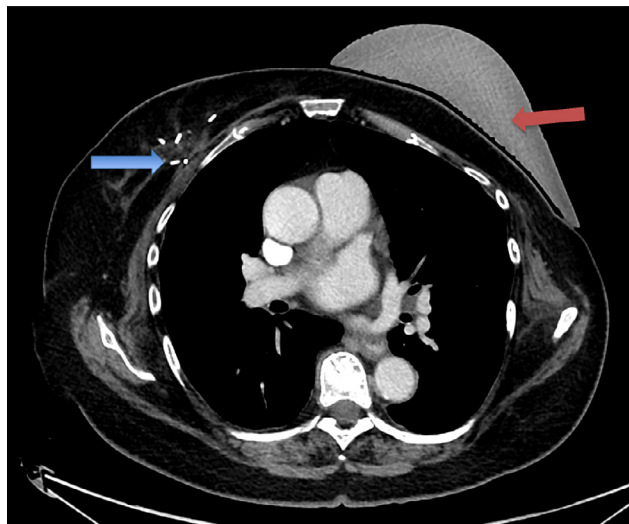
We report a case of a 77-year-old female with history breast cancer, metastatic to bone, and recently diagnosed bilateral

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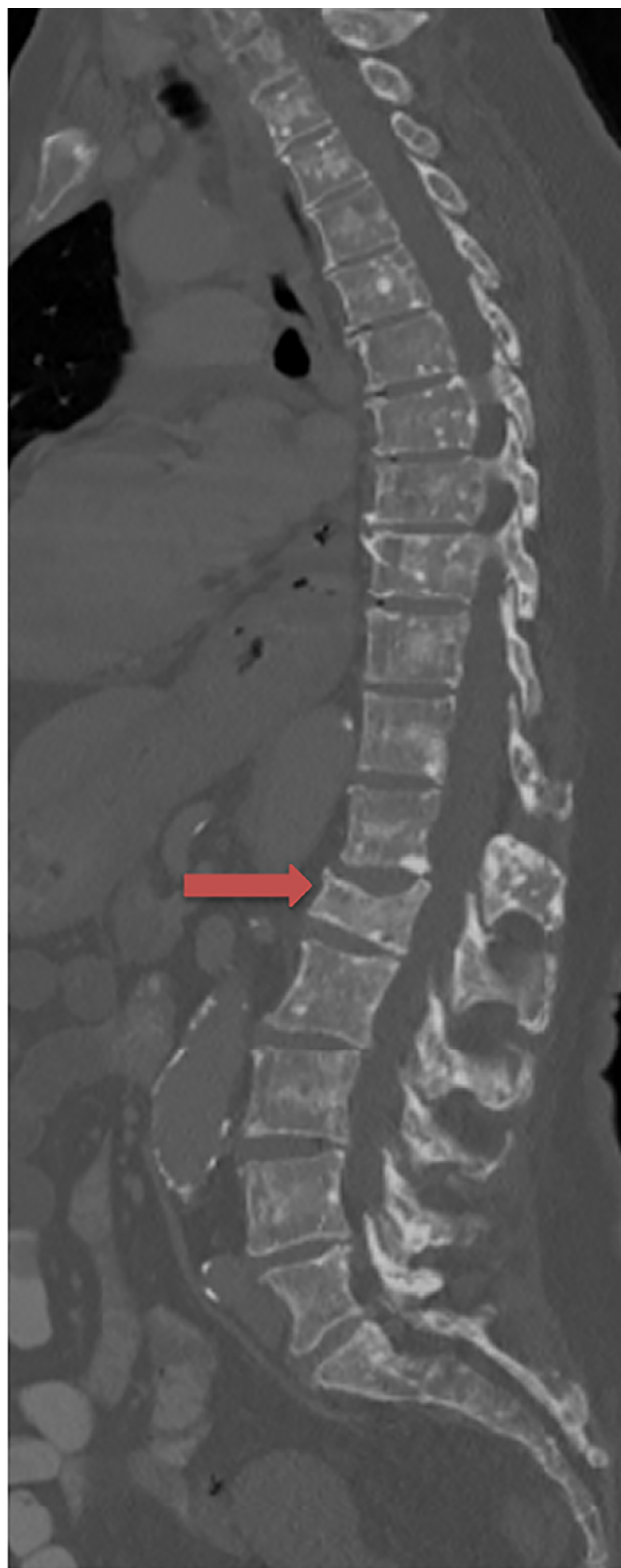


**Fig. 1 – Post lumpectomy changes with surgical clips in the right breast for treatment of DCIS (blue arrow). Post left mastectomy changes with an external breast form prosthesis following treatment of remote invasive breast cancer (red arrow). (Color version of figure is available online.)**

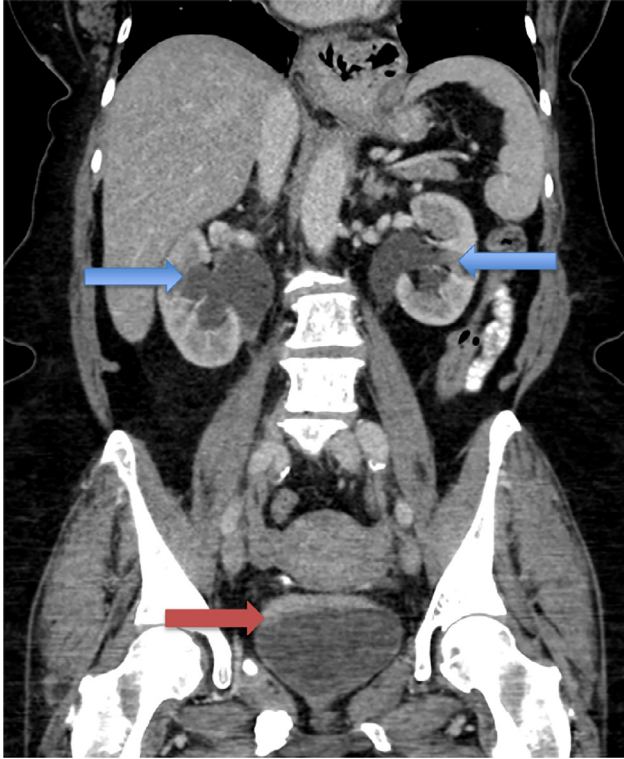
hydronephrosis, secondary to a new urinary bladder mass. Her family history is significant for her mother having endometrial cancer and her aunt having colon cancer. She is a retired paralegal and does not have a history of smoking, drinking or use of illicit drugs. She has no reported occupational toxin exposures.

The patient was diagnosed with left-sided Stage 3 breast cancer with axillary nodal metastases in 1987 and is status post left mastectomy, left axillary nodal dissection, chemotherapy, and radiation. Tumor subtype, markers, and additional details from her initial diagnosis are unfortunately not available from her initial outside institution, despite multiple requests to obtain prior records. She subsequently did not receive treatment for over 20 years. In April of 2015, the patient was found to have new right breast calcifications, biopsy of which revealed right-sided ductal carcinoma in situ, 100% estrogen receptor (ER) positive, 80% progesterone receptor (PR) positive and human epidermal growth factor receptor 2 positive. The patient underwent lumpectomy, which was followed by repeat excision for positive margins (Fig. 1). No invasive cancer was detected. Radiation therapy was not administered and the patient began a tamoxifen regimen of 20 mg per day.

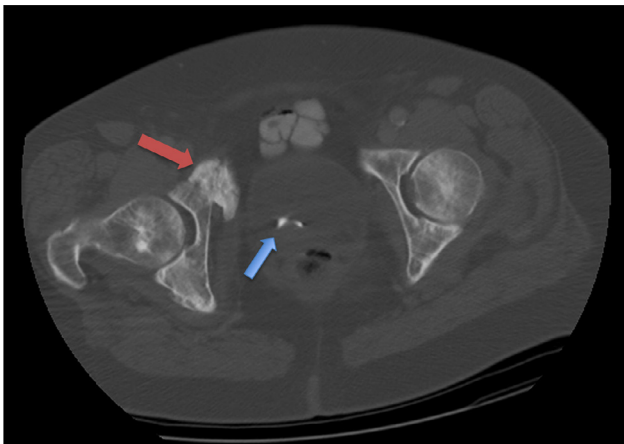
October 2015, the patient underwent MRI for right-sided hip pain that showed lesions concerning for metastatic disease, later confirmed by biopsy. The pathology revealed ER-, PR-, HER1+. In December 2015, computed tomography (CT) scan of the chest showed numerous small sclerotic foci, suggestive of metastatic disease. In December 2016, abdominopelvic CT showed scattered lytic and blastic bone lesions throughout the spine and pelvis consistent with metastatic disease (Fig. 2). She received capecitabine and denosumab for her metastatic disease and she has continued that regimen.



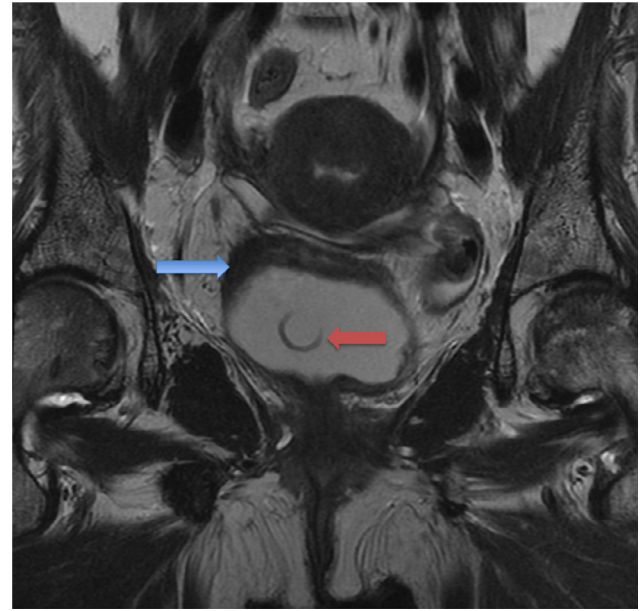
**Fig. 2 – Sagittal bone window image from a contrast-enhanced CT scan of the chest, abdomen and pelvis. Diffusely mottled appearance of the bones secondary to extensive mixed lytic and sclerotic breast cancer metastases. A compression fracture is noted at the L1 vertebral body (red arrow). (Color version of figure is available online.)**



**Fig. 3 – Coronal image from a contrast-enhanced abdominopelvic CT demonstrating bilateral hydronephrosis (blue arrows) secondary to a newly-imaged mass at the dome of the urinary bladder (red arrow). The mass was subsequently biopsied revealing metastatic breast carcinoma. Incidentally, a moderate hiatal hernia is present. (Color version of figure is available online.)**



**Fig. 4 – Axial bone window image from a contrast-enhanced CT scan demonstrating mottled appearance of the bones, secondary to diffuse lytic and sclerotic breast cancer metastases. Old pathologic fracture of the right superior pubic ramus (red arrow). Partially-imaged right ureteral stent in the urinary bladder (blue arrow). (Color version of figure is available online.)**

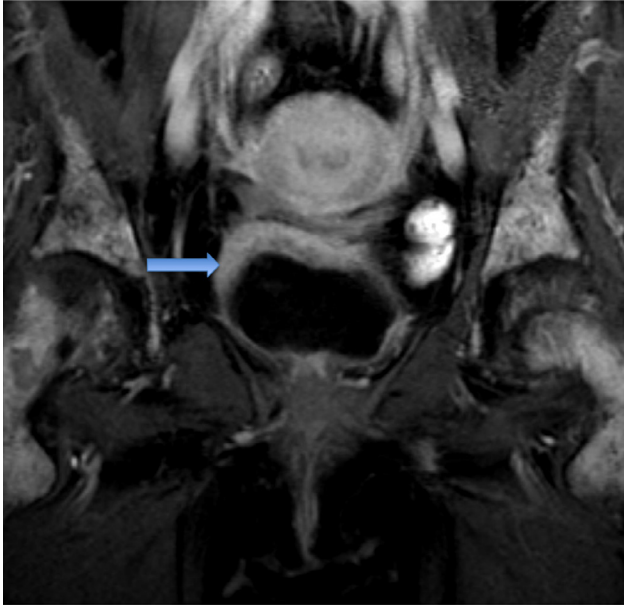


**Fig. 5 – Coronal T2-weighted MRI image demonstrating low signal wall thickening of the urinary bladder dome, representing breast cancer metastasis (blue arrow). Partially-imaged right ureteral stent in the urinary bladder (red arrow). (Color version of figure is available online.)**

In December of 2017, the patient presented to our institution for a second opinion. She underwent biopsy and right ureteral stent placement because of newly diagnosed bilateral hydronephrosis and a urinary bladder mass, which was discovered on a CT scan (Fig. 3) and followed up with MRI (Figs. 5 and 6). In January of 2018 she underwent a transurethral resection of the bladder tumor due to biopsy that was concerning for possible metastatic breast cancer.

The resected bladder tumor showed an infiltrative pattern of “signet ring” type cells with moderate atypia in the subepithelia and detrusor muscle and absence of carcinoma in situ or glandular metaplasia. The immunophenotyping done was suggestive of a CDH1 mutation, which is the result of either pleomorphic lobular carcinoma or diffuse gastric carcinoma. Immunohistochemical stains were positive for CK7, CEA, p16, and BRST-2, with controls demonstrating appropriate positive staining. Stains for estrogen and progesterone were focally positive. Bilateral ureteral stents were placed at the time of biopsy to relieve the obstruction (Fig. 4). BRST-2, ER, and PR staining favored a breast primary, most likely the case in this clinical setting.

The patient is currently undergoing chemotherapy and is on cycles of paclitaxel weekly, 3 weeks on, and 1 week off, with denosumab after 4 weeks. After 3 cycles the patient was imaged and restaged, CT scan of April 2018 demonstrated stable disease and the patient is to undergo another 3 cycles with repeated imaging and staging. She is still being followed by the Hematology and Oncology service and is being treated for any symptoms. Her only reported symptom is fatigue, which is likely secondary her chemotherapeutic regimen.



**Fig. 6 – Coronal T1-weighted fat-suppressed postcontrast MRI image of the pelvis demonstrating enhancing wall thickening of the urinary bladder dome, representing breast cancer metastasis (blue arrow). Scattered low signal bone metastases are noted. (Color version of figure is available online.)**

### Discussion

With advancements in imaging and therapy, patients with metastatic breast cancer often demonstrate longer life expectancy. This case is unusual, as the patient was initially diagnosed with breast cancer nearly 30 years prior to the diag-

nosis of her metastatic disease, including to bone and subsequently to the urinary bladder. There are few reported cases of breast cancer metastasizing to the urinary bladder. As patients continue to live longer, we may need to be prepared for more atypical presentations of metastatic disease. Our patient lived for many years without symptoms or signs of metastases. This case will hopefully encourage discussion regarding survivorship care and surveillance following breast cancer therapy, even decades after initial diagnosis.

### Conclusion

Urinary bladder metastasis from breast cancer is not common. As life expectancy has increased, both in the general population and amongst many cancer patients, uncommon patterns of metastases may become more common. Standard metastatic workups and surveillance may require adjustments in the future.

### REFERENCES

- [1] DeSantis C, Ma J, Bryan L, Jemal A. Breast cancer statistics, 2013. *CA Cancer J Clin* 2014;64:52–62.
- [2] Marino N, Woditschka S, Reed LT, et al. Breast cancer metastasis: issues for the personalization of its prevention and treatment. *Am J Pathol* 2013;183:1084–95.
- [3] Łuczyńska E, Pawlik T, Chwalibóg A, Anioł J, Ryś J. Metastatic breast cancer to the bladder case report and review of literature. *J Radiol Case Rep* 2010;4:19–26.
- [4] Cormio L, Sanguedolce F, Di Fino G, et al. Asymptomatic bladder metastasis from breast cancer. *Case Rep Urol* 2014;2014:672591.