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Breast Cancer Metastatic to the Urinary Bladder

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ABSTRACT

Breast cancer is common and has the potential to spread to multiple organs. This article describes metastasis to the urinary bladder. In most instances, breast cancer metastatic to the bladder is associated with other pelvic organ metastasis. In patients with known metastatic breast cancer, bladder screening is not warranted. However, if lower urinary tract symptoms persist, an evaluation of the bladder should be considered to rule out metastatic involvement.

INTRODUCTION

The lifetime risk for developing breast cancer, the most common type of malignancy afflicting American women, is one in eight women.[1,2] Metastasis of breast cancer is common; however, metastasis to the bladder is rare, with a documented incidence of roughly 3%. In most instances, breast cancer metastatic to the bladder is associated with other pelvic organ metastasis. In patients with known metastatic breast cancer, bladder screening is not warranted. However, if lower urinary tract symptoms persist, an evaluation of the bladder should be considered to rule out metastatic involvement.

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Key Words: Bladder, bladder tumor, breast, hematuria, incontinence, metastasis

CASE REPORT

Our experience involved a 67-year-old female who presented with lower urinary tract symptoms and was noted to have a fixed pelvic mass on examination. Her history was significant for invasive breast carcinoma of the lobular type with 7/14 lymph nodes containing cancer. After adjuvant therapy, she did not return for a follow-up visit for several years. Her physical

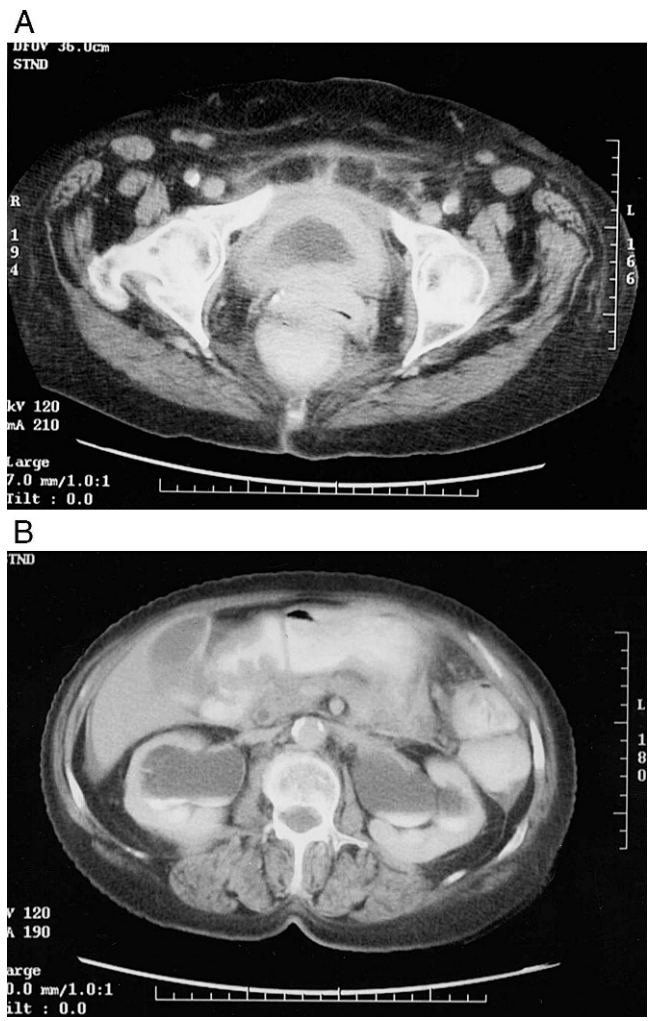

Figure 1. A. CT scan revealing extensive bladder wall thickening and filling defect. Figure B. Bilateral hydronephrosis as a result of ureteral compression.

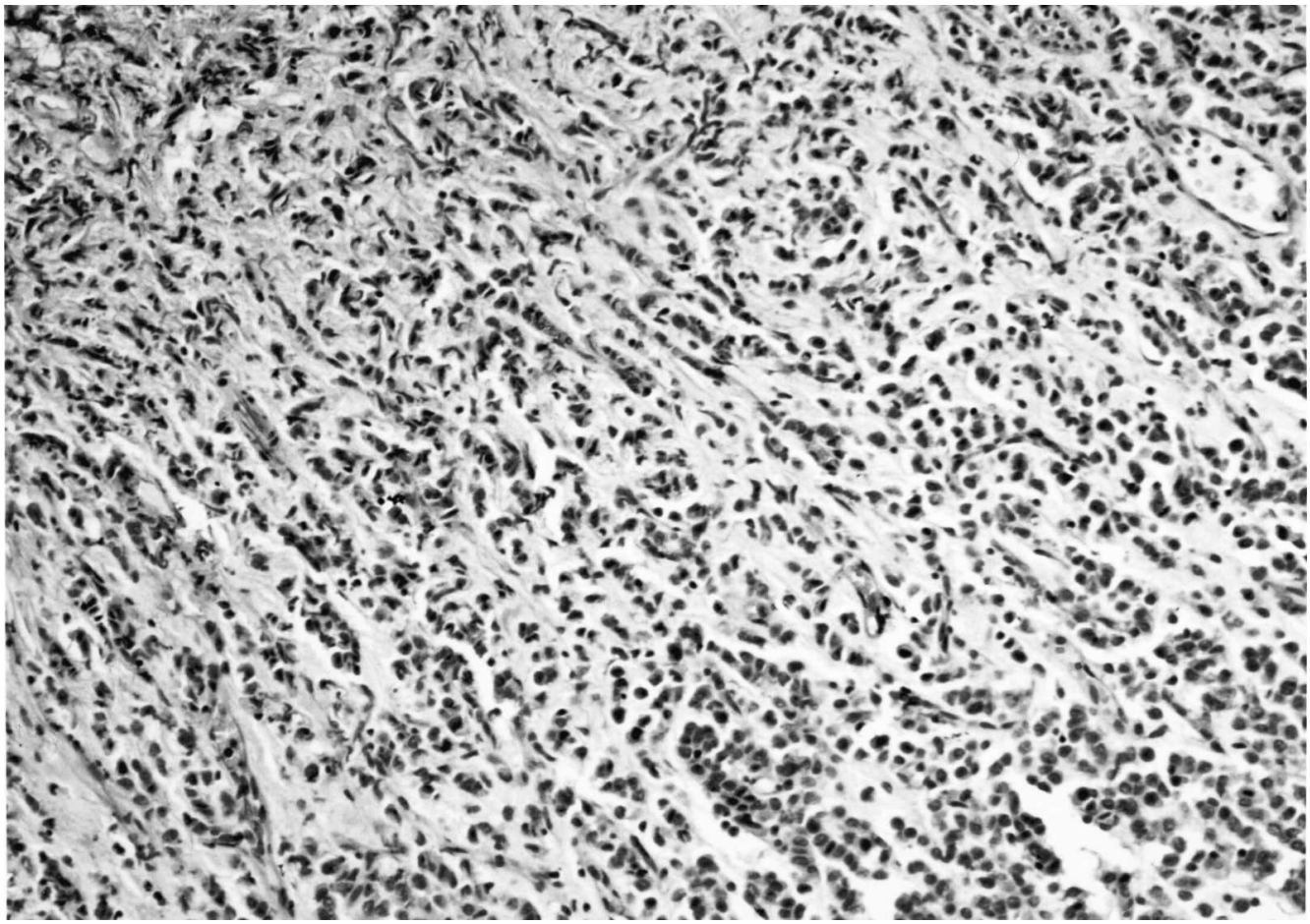

Figure 2. Lobular carcinoma of the breast metastatic to the bladder (hematoxylin and eosin, original magnification × 250).

examination confirmed the presence of a fixed mass involving the cervix. Microscopic hematuria was present, and a computed tomography (CT) scan revealed diffuse pelvic disease (Fig. 1). Cystoscopy revealed an intraluminal bladder lesion. Biopsies of the cervix and transurethral resection of the intraluminal bladder mass were performed. The pathology confirmed metastatic breast cancer (Fig. 2). The patient refused further treatment and returned home. She expired 8 months after diagnosis.

DISCUSSION

When a patient is diagnosed with breast cancer, tumor stage and lymph node involvement remain the most accurate prognostic indicators. Metastases from breast carcinoma can be initiated even when the primary tumor is less than 0.125 cm in size, as dissemination of the tumor occurs soon after vascularization of the primary tumor.[2] The pattern of breast cancer metastasis is created by a combination of tumor cell characteristics and specific host factors. This interplay may be thought of in terms of the ''seed and soil hypothesis'' of Paget, which states that certain tumors metastasize only to certain organs that provide the environment needed for tumor reestablishment and growth.[2] More often, breast carcinoma metastasizes to lymph nodes, lung, liver, bone, brain, thyroid, and the heart.[3] Metastasis of breast carcinoma to the urinary bladder is rare, which may indicate that the bladder does not provide fertile ''soil'' for the ''seed.'' Since 1956, only 26 clinically diagnosed cases of metastasis of breast cancer to the bladder have been reported.[4–15] Other sites of metastasis were evident in most of these cases; only three cases reported solitary metastasis to the bladder.[6,11,14] Of the 26 cases, 21 patients presented with urinary symptoms. Frequency and hematuria were the most common symptoms (11 and 10, respectively, of 26 patients), followed by nocturia, incontinence, and dysuria. Other symptoms were urgency, urinary retention, flank pain, and abdominal pain. Five cases were uncovered in the absence of clinical symptoms during routine urinanalysis (which revealed microhematuria), CT scan showing either hydronephrosis or

Table 1. Clinical Presentations of 26 Cases Reported from 1956 to 2001

Source	Date	Cystoscopy	Urologic Symptoms
Ganem & Batal[7]	1956	Large tumor in left lateral wall posterior and lateral to left ureteral orifice	Gross hematuria
Perez-Mesa et al[10]	1965	Case 1: tumor infiltrating posterior wall; ulcerated mucosa	Frequency, incontinence, gross hematuria
		Case 2: tumor in right trigone, which obscured both ureteral orifices	Frequency, gross hematuria
		Case 3: diffuse tumor	Frequency, nocturia
		Case 4: pedunculated mass in the fundus	Frequency, dysuria, gross hematuria
		Case 5: extensive tumor with severe erythema of mucosa	Frequency, nocturia, incontinence, hematuria
		Case 6: no mucosal lesions, fixation of posterior wall, reduced bladder capacity	Nocturia, frequency
Pontes & Oldford[5]	1970	Case 1: tumor near right ureteral orifice	Gross hematuria
		Case 2: cauliflower-like tumor adjacent to right ureteral orifice	Left flank pain
Haid et al[8]	1980	Case 1: two irregular sessile tumors	Gross hematuria
		Case 2: reduced bladder capacity, numerous areas of mucosal nodularity	Frequency, nocturia, incontinence
		Case 3: not performed	No symptoms
		Case 4: walnut-sized tumor at left ureteral orifice	No symptoms
Mairy et al[9]	1982	??	No symptoms
		??	Frequency, dysuria, incontinence (continued)
Silverstein et al[14]	1987	Case 1: smooth, raised immobile lesion on right lateral wall with irregular vessels	Frequency, urgency, nocturia, intermittent abdominal pain
		Case 2: extensive nodularity of right lateral wall	Gross hematuria, dysuria
Rigatti et al[12]	1991	Case 1: exophytic mass in right ureteral orifice	Renal colic
		Case 2: small, elevated and reddened area in lateral wall	Irritative bladder symptoms and incontinence
Williams et al[15]	1992	Large tumor in bladder vault	Frequency, nocturia
Berger et al[4]	1992	Case 1: tumor on right lateral walls and bladder neck	No symptoms
		Case 2: not specified	Urinary retention
		Case 3: not performed	No symptoms
Schneidau et al[13]	1995	Diffuse bullous edema	Flank pain, dysuria, gross hematuria
Elia et al[6]	1999	Polyps lateral to left ureteral orifice	Incontinence
Poulakis et al[11]	2001	Multiple invasive tumors on posterior wall	Frequency, urgency, nocturia

thickened bladder wall, or pelvic examination which revealed a mass (Table 1).[4,8,9]

Metastasis to the bladder is thought to occur either by extension from retroperitoneal involvement or from venous emboli implantation into the serosa.[4] Direction of tumor growth is from the outer layer of the bladder towards the mucosa. Urinary symptoms correlate with the advancement of this growth.[6,9] Patient complaints are rare until the tumor penetrates the mucosal lining, late after metastasis has occurred. Therefore, the number of clinical reports is not a good indicator of true incidence, because many metastases may be inapparent if they are confined to the serosal or muscular layers.

To reveal the true incidence of breast carcinoma metastatic to the bladder, autopsy and pathology reports provide additional insight. Several studies analyzing the autopsies of patients who died from breast cancer give us an idea of the incidence of metastasis to the bladder as a subset of breast cancer metastases (Table 2). One study sets the uppermost incidence at less than 10%. Viadana et al. reviewed 647 autopsy reports of patients who died of breast cancer and reported incidences of metastasis to

Table 2. Incidence of Metastatic Breast Cancer to Bladder Among Autopsy Reports of Deaths Caused by Breast Carcinoma

Source	Number of Autopsies	Cases of Bladder Metastasis	Percent of Incidence
Hagemeister et al[16]	166	8	5%
Pontes & Oldford[5]	85	6	7%
Abrams et al[17]	167	4	2%
Saphir & Parker[18]	43	0	0%
Warren & Witham[19]	162	0	0%
Total	623	18	3%

various organs.[20] They purposefully omitted reporting metastasis to organs when the frequency of their being seeded was below 10%. Metastasis to the bladder is not mentioned. In another study, Hagemeister et al. evaluated 166 autopsies of patients who died of breast cancer. Eight cases of metastasis to the bladder were found, none of which were clinically suspected.[16] Pontes and Oldford found 6 cases of bladder metastasis among 85 autopsies of people dying from widespread breast cancer.[5] Out of 167 reports of deaths from breast cancer, Abrams et al found 4 cases of metastasis to the bladder.[17] Two studies of autopsies of this type found no metastasis to the bladder at all. In a review of autopsy reports of 43 people who died from metastatic breast carcinoma, Saphir and Parker did not report any metastasis to the bladder.[18] Warren and Witham described the distribution of 162 breast cancer metastases and did not report any metastasis to the bladder.[19]

Two analyses of the histopathologic findings of urinary tract tumors give a different vantage point; they define the incidence of breast carcinoma metastatic to the bladder as a percentage of lesions within the urinary bladder. In a review of 142 cases of urinary involvement by metastatic malignant growths, Klinger found 3 cases of bladder metastases, with the primary lesion being breast carcinoma.[21] Melicow analyzed 2,502 specimens of bladder tumors, non-neoplastic vesical lesions associated with bladder tumors, and other pathological processes resembling tumor and discovered only 9 cases of metastatic breast cancer to the bladder.[22] This study appears to most closely describe the clinical incidence of breast cancer metastasis to the bladder as identified by the urologist.

CONCLUSION

Encountering a woman who has breast cancer or is recovering from breast cancer is inevitable in any medical practice. Even though the incidence of metastasis to the bladder is not as great as it is to other sites, the sheer volume of patients with breast cancer makes the 3% incidence of bladder metastasis consequential.

With increased public awareness of breast cancer and increased screening, the frequency of in situ disease (Stage 0) has nearly doubled, the frequency of Stage I has increased from 27.7% to 36%, and the frequency of advanced stages has decreased at the time of diagnosis. Because the stage of disease at the time of diagnosis is the most accurate prognostic indicator, this trend, together with the widespread use of cytotoxic and hormonal therapies, will continue to reveal cancers at the early stages and decrease the incidence of metastatic disease. While routine surveillance is not warranted based on the rarity of the occurrence, if a woman with a history of breast cancer presents with lower urinary tract symptoms, a careful work-up to rule out metastasis should be considered.

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