

Oncology

Repair of iatrogenic ureteral injury secondary to breast cancer metastasis

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ABSTRACT

We present a case of unforeseen ureteral metastasis from a primary breast cancer. A ureteral injury leak was postoperatively recognized after a hysterectomy and bilateral oophorectomy were performed. Subsequent repair with a psoas hitch ureteral re-implant was performed and breast cancer metastasis was discovered in the ureteral stump specimen.

Introduction

Ureteral metastasis is rare because of the lack of continuous longitudinal blood and lymphatic supply. Thus, the ureters are relatively resistant to metastasis.¹ Neoplasms of the stomach, breast, urinary bladder, and prostate are the primary tumors that most frequently metastasize to the ureter.² Only 8% of reported ureteral metastases are from carcinoma of the breast.³ Iatrogenic injury to the ureter in conjunction with previous pelvic surgery is relatively common. However, iatrogenic injury in the setting of ureteral metastasis has not previously been reported.

Case presentation

In this case, a 42-year old female presented with a left ureteral injury (see Fig. 1) with leakage status post laparoscopic hysterectomy and bilateral salpingo-oophorectomy which was done after a pet scan that demonstrated a high amount of radioactivity in the pelvis. The pet scan and the patient's history of breast cancer put her at a high risk for endometrial cancer and metastasis to the ovaries. Her past medical history was significant for diabetes, morbid obesity, and metastatic infiltrating lobular carcinoma of the left breast. Her tumor was ER positive and HER2/negative with peritoneal carcinomatosis and with extensive metastasis to the abdomen, stomach, uterus, and ovaries. Her surgical history was significant for a radical left mastectomy in April 2017, and laparoscopic sleeve vertical gastrectomy in July 2018 in which breast cancer was found to have metastasized to the resected

gastric specimen. The patient has been treated with letrozole and kisqali for her breast cancer since August 2018.

To manage the urine leak initially, a ureteral stent was placed in hopes of the leak resolving, however after several months, the ureteral leak persisted. The patient's prognosis (greater than 2 years) and performance status were good at this time and the decision was made for surgical repair over serial stent exchanges. An open approach was chosen and there was difficulty with fibrous adhesions. Even with the stent in place, the ureter was challenging to identify due to the dense adhesions, tumor, and inflammatory reaction from the previous surgery. The ureter was transected proximal to the area of scar and leakage. In order for the ureter to reach the bladder, a psoas hitch bladder mobilization was performed. This obtained about 4 cm of reach and the ureter was successfully re-implanted with a stent without tension into the bladder. The ureteral stent was removed 6 weeks post-op and follow up ultrasound without the stent showed no hydronephrosis.

Pathology showed (see Fig. 2a-b) in the ureteral specimen infiltrating malignant tumor consistent with lobular carcinoma of breast. Cancer cells are primarily within the ureteral wall. Pathology further reported benign urothelium lining this section of ureter. Her tumor was found to be ER positive and HER2/negative.

Discussion

Injuries to the ureter during surgery are varied and iatrogenic injury during pelvic gynecologic procedures is the most common.¹ This case is the first reported iatrogenic ureteral injury that may have been

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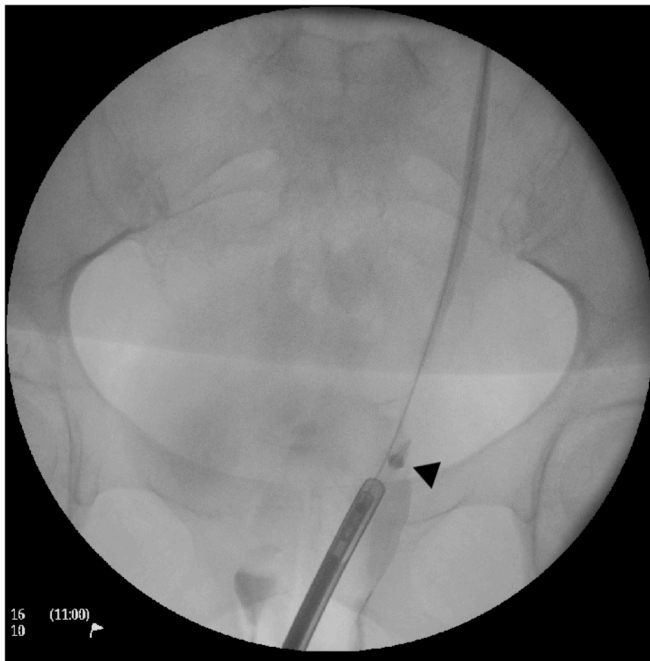


Fig. 1. Leak (arrowhead) seen on retrograde pyelogram.

secondary to a breast cancer metastasis.

Metastatic tumors of the ureter are uncommon and one of the rarest causes of ureteral obstruction. First reported by Stow in 1909, only 400 cases are on record to date.⁴ Autopsy studies have also revealed only rare occurrences of ureteral metastasis, and in a series of 10233 consecutive autopsies, the incidence of ureteral metastasis was only 0.37%.⁴ Other than this case, there are a total of 8 reports of patients with metastatic breast cancer to the ureter.³

Ureteral metastasis can present in a variety of ways. Most of the time, ureteral metastasis is asymptomatic. Back pain occurs in approximately half of patients and a third will have hematuria.⁵

Although fewer than 10% of patients with breast cancer first manifest with metastatic disease, relapse occurs in nearly 50% of apparently localized tumors within three years of diagnosis.² By the time there is metastasis to the ureter, most patients will have metastatic lesions elsewhere and systemic therapy is generally required.

Conclusion

In this case, we identified a rare and unforeseen ureteral metastasis in our patient with primary breast cancer. Initially, the patient may have benefited from placement of ureteral stents to better identify the ureter during an anticipated hysterectomy. It is likely that the metastatic disease to the ureter made the ureter more vulnerable to injury during pelvic dissection of the uterus and ovaries. Post iatrogenic injury, definitive repair with psoas hitch ureteral implant was performed. This

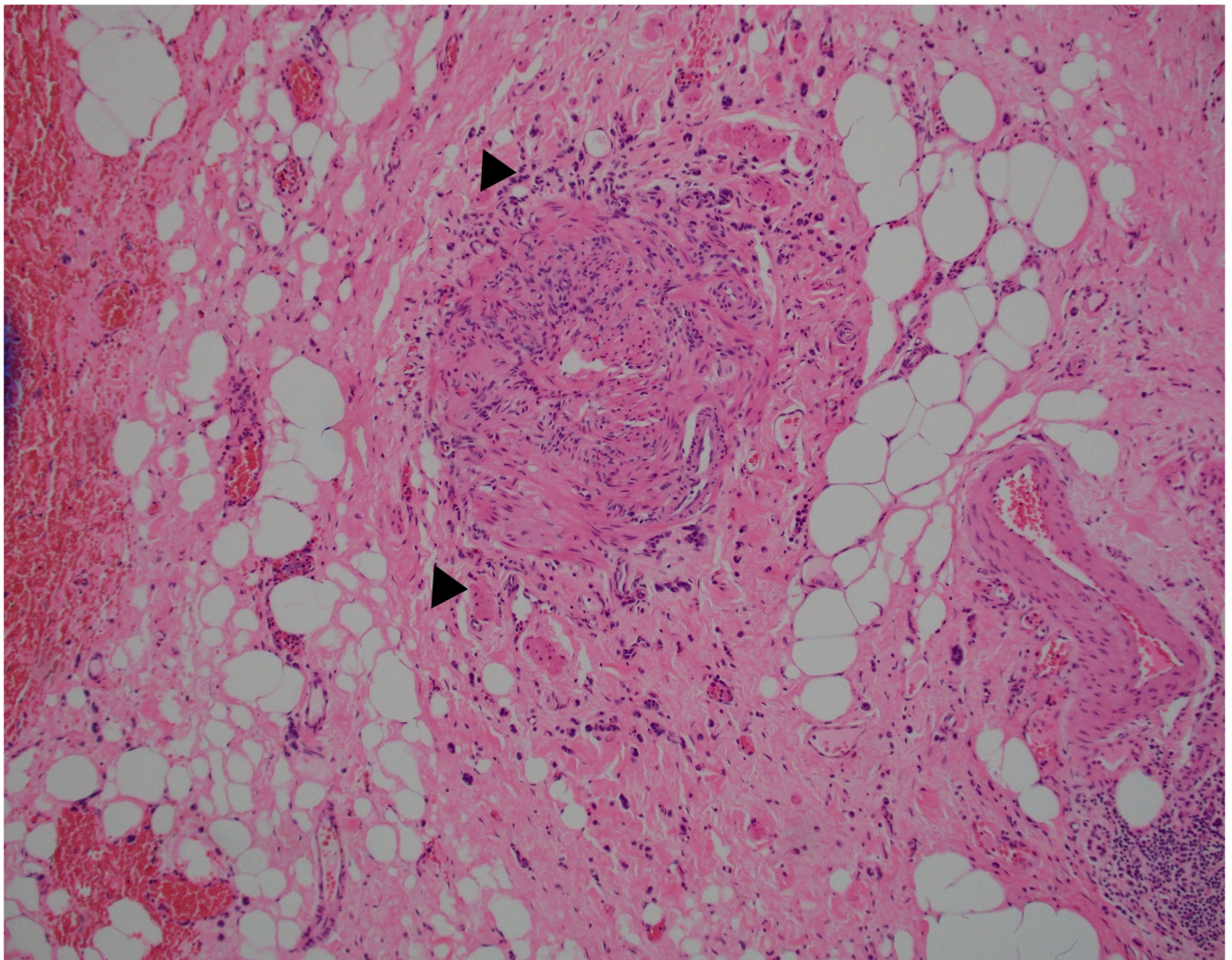


Fig. 2a. (H&E x10) High power view of boxed area demonstrating metastatic tumor cells in the periureteral fibro-adipose tissue and lymphatics (arrowheads).

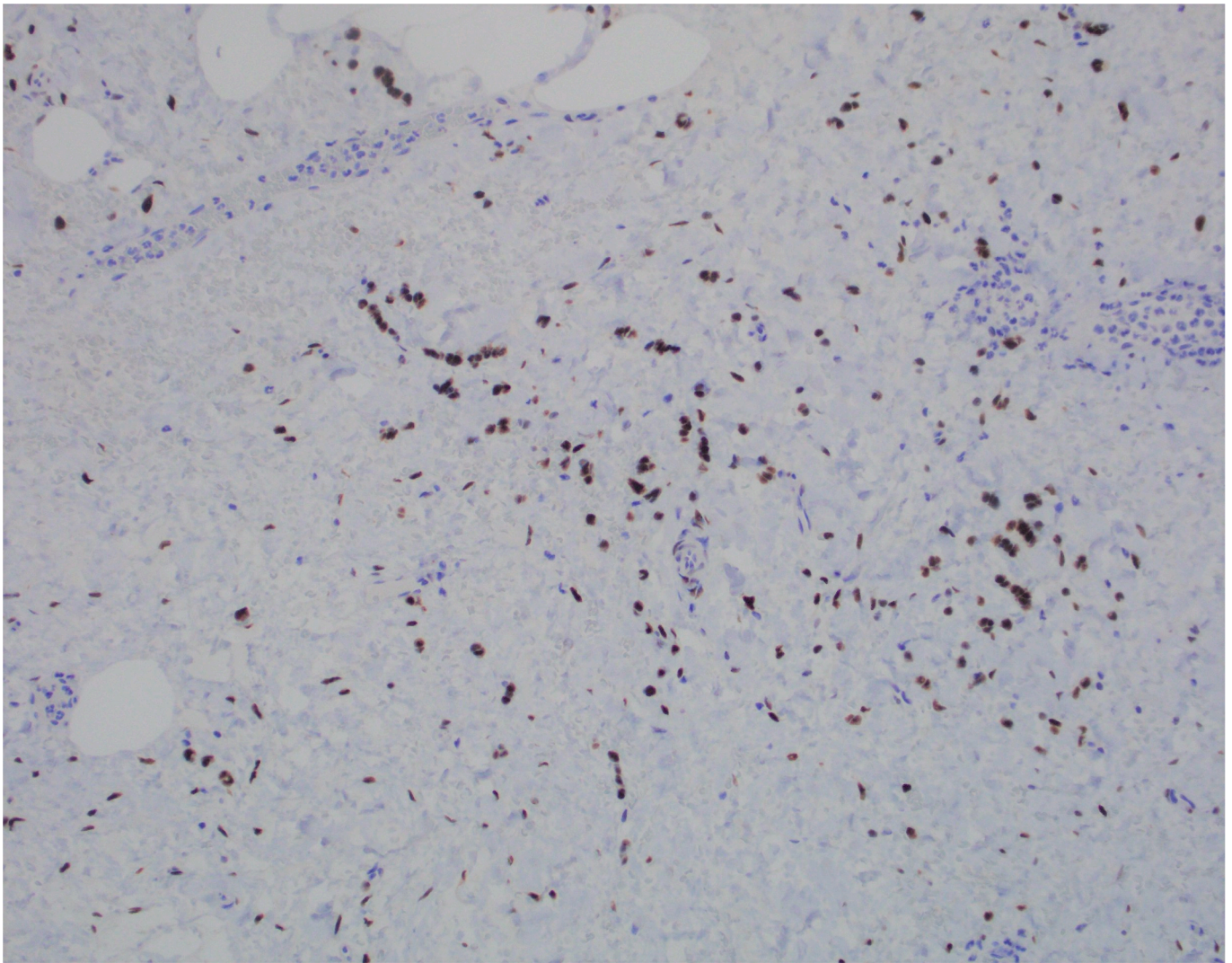


Fig. 2b. Immunohistochemical stain of estrogen receptor demonstrating lightened tumor cells (in brown).

durable repair in contrast to stent exchanges is a quality of life benefit which will help preserve the renal function of the left kidney and aid the patient in her future chemotherapy regimen.

Conflicts of interest

There are no conflicts of interest.
Proper consent was obtained.

Declaration of interest

None.

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