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Urethral Recurrence of Urothelial Carcinoma of the Bladder Following Radical Cystectomy: An Unusual Imaging Pattern

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ABSTRACT

Residual urethra is a common site of recurrence in patients undergoing radical cystectomy with urinary diversion for bladder cancer. Urethral recurrence (UR) clinically manifests as a penile mass or a bloody or purulent penile discharge at a median of 13 months after surgery. And on imaging studies, it characteristically appears as a focal intraluminal mass, urethral wall thickening, or an infiltrating mass arising from the urethra. We, herein, present an unusual case of UR manifesting as a large cyst in the penile root 4 years after radical cystectomy with urinary diversion for muscle-invasive bladder cancer. Further, a complex cystic mass developed in the same location 2 years after the excision of the cystic UR. This case shows that the imaging spectrum of UR after radical cystectomy may be wider and may include cystic and complex patterns.

Keywords: Bladder cancer, Radical cystectomy, Urethral recurrence, Magnetic resonance imaging

INTRODUCTION

Radical cystectomy with urinary diversion is the method of choice for the treatment of muscle-invasive bladder cancer.[1] In these cases, urinary diversion is achieved by the reconstruction of an orthotopic neobladder or an ileal conduit.[2] Transitional cell carcinoma, the most common pathological type of bladder carcinoma, is defined as a pan-urothelial disease characterized by recurrent and multifocal metachronous tumors of urinary organs. Therefore, the residual urethra is a site at risk for recurrence in patients undergoing radical cystectomy with urinary diversion.[1] Urethral recurrence (UR) rates after radical cystectomy have been shown to be 1.4% and 6.2% in patients with orthotopic neo-bladder and ileal conduit, respectively.[3] According to the previous reports, UR characteristically presents as a focal intraluminal mass, urethral wall thickening, or an infiltrating mass arising from the urethra.[4-6] To the best of our knowledge, a case of bladder cancer with UR showing cystic pattern has never been reported to date. We, herein, present a 64-year-old patient who developed a large cystic recurrent urethral mass 4 years after undergoing a radical cystectomy with urinary diversion for muscle-invasive bladder cancer.

CASE REPORT

A 64-year-old male patient who underwent radical cystectomy with an ileal conduit for muscle-invasive urothelial carcinoma of the bladder 4 years ago presented with the

complaint of progressive swelling in the root of the penis. A large, painless, and penoscrotal mass was detected on physical examination. On pelvic magnetic resonance imaging (MRI), it was a 95 × 65 × 65 mm (AP × T × CC) cyst extending along the proximal half of the penile shaft. Solidified material and septa, probably belonging to an organized hematoma, were noted within the cyst [Figure 1]. The cyst wall, as well as the penile crura and residual urethra, showed enhancement following gadolinium administration [Figure 2]. The cyst was then aspirated, and the material was a dark brown viscous liquid containing clot and purulent material. Cytology revealed invasive urothelial carcinoma, and cyst excision with partial urethrectomy was performed. No connection was detected between the cyst cavity and the urethral lumen during surgery. Comprehensive imaging studies showed no other signs of local recurrence or distant metastasis, and the patient's routine clinical and radiological follow-up continued.

Two years after the cyst excision, the patient presented with a painless hard penile mass. Pelvic MRI revealed a lobulated lesion measuring 52 × 32 × 27 mm (CC × AP × T) in the penile root. The penile mass extended from the cystectomy stump posteriorly into the penile shaft, invading the penile crura, and urethra [Figure 3]. The mass showed heterogeneous high signal in T1-, T2-, and fat-suppressed T2-weighted sequences, consistent with a complex hemorrhagic cystic lesion. There was no anal canal or puborectal muscle invasion, but both corpora cavernosa were invaded. The mass exhibited intense heterogeneous enhancement following gadolinium administration [Figure 4]. A total penectomy was planned. However, the patient did not consent to the operation due to his body image concerns. Therefore, cisplatin-containing combination chemotherapy was started.

One year after the initiation of the chemotherapy, the pelvic MRI showed that the penile mass was now 62 × 46 × 30 mm (CC × AP × T) and appeared more infiltrative than it was a year ago [Figure 5]. In addition, thoracic computed tomography examination revealed multiple metastatic pulmonary nodules

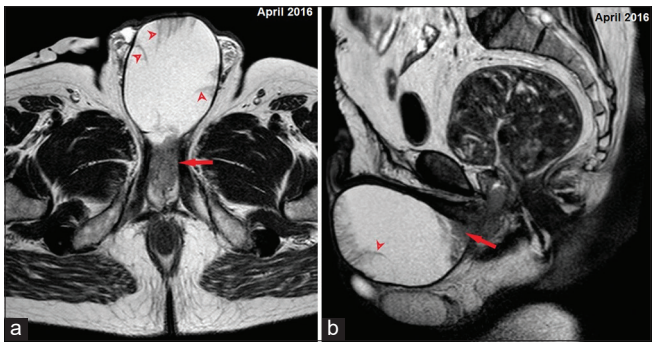

Figure 1: A 64-year-old man who underwent radical cystectomy for bladder cancer 4 years ago. (a) Axial T2-weighted magnetic resonance image shows a large cyst extending along the proximal half of the penile shaft. Note the cyst includes septa (arrowheads) and solidified material (arrow). (b) Sagittal T2-weighted magnetic resonance image shows a large cyst extending along the proximal half of the penile shaft. Note the cyst includes septa (arrowhead) and solidified material (arrow).

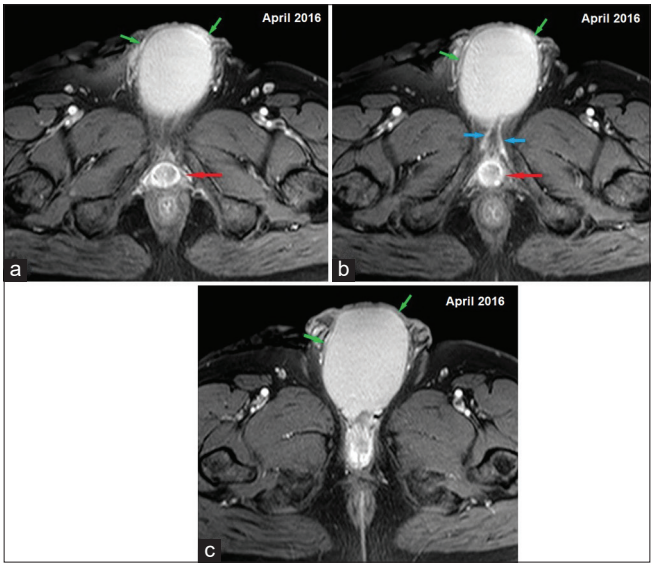

Figure 2: A 64-year-old man who underwent radical cystectomy for bladder cancer 4 years ago. (a) Axial contrast-enhanced fat-suppressed T1-weighted magnetic resonance image shows the enhancement of the urethra (red arrow) and cyst wall (green arrows). (b) Axial contrast-enhanced fat-suppressed T1-weighted magnetic resonance image shows the enhancement of the urethra (red arrow), penile crura (blue arrows), and the cyst wall (green arrows). (c) Axial contrast-enhanced fat-suppressed T1-weighted magnetic resonance image shows the enhancement of the cyst wall (green arrows).

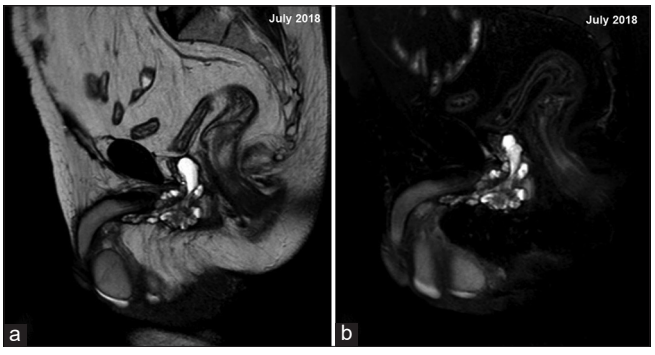

Figure 3: A 64-year-old man who underwent radical cystectomy for bladder cancer 6 years ago and partial urethrectomy for urethral recurrence two years ago. (a) Sagittal T2-weighted magnetic resonance image shows a lobulated lesion in the penile root. (b) Sagittal fat-suppressed T2-weighted magnetic resonance image shows a lobulated lesion in the penile root.

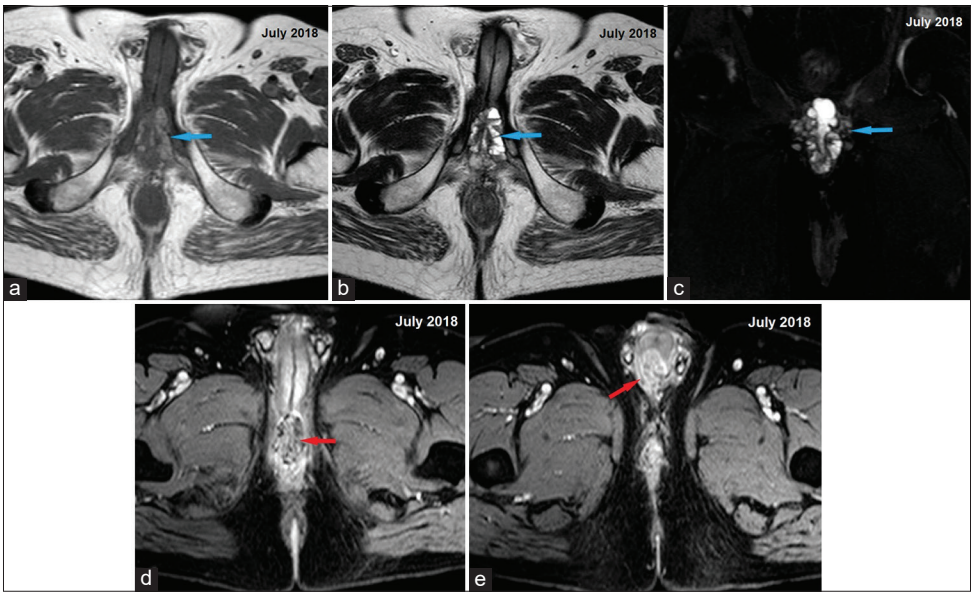

Figure 4: A 64-year-old man who underwent radical cystectomy for bladder cancer 6 years ago and partial urethrectomy for urethral recurrence two years ago. (a) Axial T1-weighted magnetic resonance image shows a heterogeneous mass extending along the proximal penile urethra (blue arrow). (b) Axial T2-weighted magnetic resonance image shows a heterogeneous mass extending along the proximal penile urethra (blue arrow). (c) Coronal fat-suppressed T2-weighted magnetic resonance image shows a lobulated mass with high signal extending along the proximal penile urethra (blue arrow). (d) Axial contrast-enhanced fat-suppressed T1-weighted magnetic resonance image shows the enhancement of the mass in the penile root (red arrow). (e) Axial contrast-enhanced fat-suppressed T1-weighted magnetic resonance image shows the enhancement of the mass in the penile shaft (red arrow).

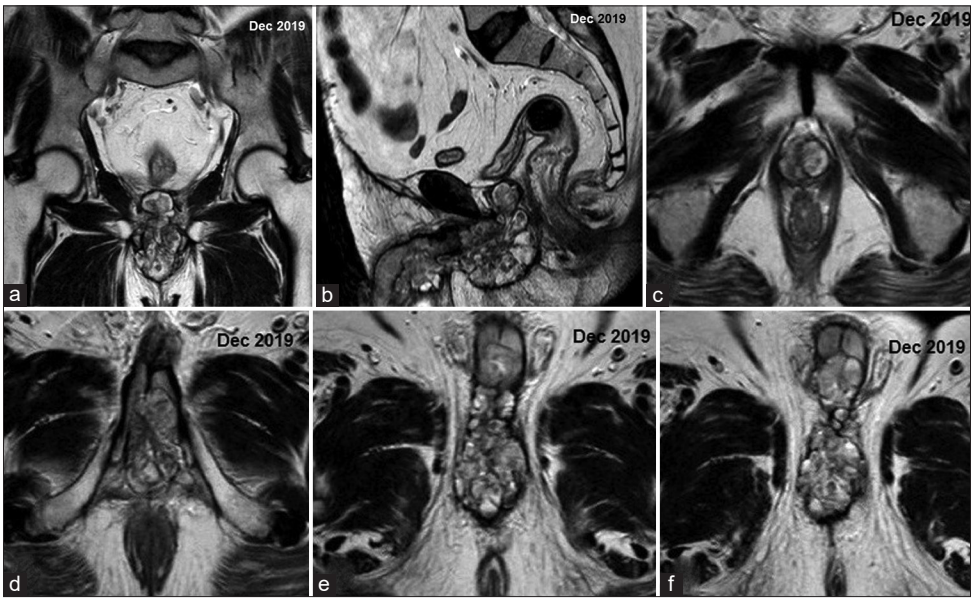

Figure 5: A 64-year-old man who have undergone radical cystectomy for bladder cancer and partial urethrectomy and chemotherapy for urethral recurrence. (a) Coronal T2-weighted magnetic resonance image shows that the cyst has significantly enlarged and appears more infiltrative than before. (b) Sagittal T2-weighted magnetic resonance image shows that the mass has significantly enlarged and appears more infiltrative than before. (c) Axial T2-weighted magnetic resonance image shows that the mass has significantly enlarged. (d) Axial T2-weighted magnetic resonance image shows that the mass has significantly enlarged. (e) Axial T2-weighted magnetic resonance image shows that the mass has significantly enlarged. (f) Axial T2-weighted magnetic resonance image shows that the mass has significantly enlarged.

in both lungs [Figure 6]. This time, on the consent of the patient, total penectomy, and urethral mass excision, was performed. No surgical complications occurred. A 3-month follow-up was planned and the patient was discharged.

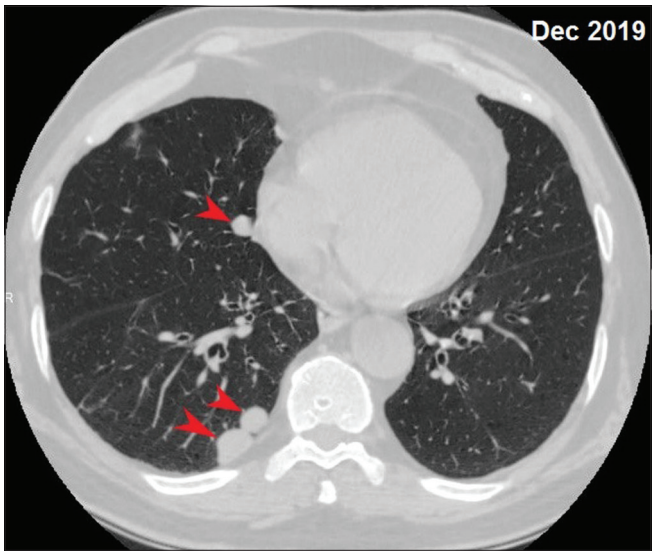

Figure 6: A 64-year-old man who have undergone radical cystectomy for bladder cancer and partial urethrectomy and chemotherapy for urethral recurrence. Axial computed tomography image shows multiple metastatic pulmonary nodules (arrowheads).

DISCUSSION

Given the pan-urothelial nature of transitional cell carcinoma, the residual urethra is a predictable site of recurrence after radical cystectomy with urinary diversion. It has been shown that up to 70% of cases of UR can be detected by cytological evaluation of voided urine, catheterized urine, or urethral washings before the patients develop clinical symptoms. Moreover, the survival rate of asymptomatic patients who are cytologically diagnosed has been found to be significantly higher than that of symptomatic patients. Based on these findings, urine cytology has been proposed to be a part of the oncological surveillance protocol for early detection of UR after radical cystectomy.[7] A periodic cytological follow-up program had been planned for the patient that we presented. However, he did not comply with the controls and was admitted symptomatically 4 years after the operation.

UR has been reported to present at a median of 13 months (range: 6–23 months) after radical cystectomy.[8] It manifests as a penile mass or a bloody or purulent penile discharge.[9] On imaging studies, it appears as a focal intraluminal mass, wall thickening with luminal narrowing, or an infiltrating mass arising from the urethra.[4-6] We demonstrated an unusual case of UR presenting as a cyst which showed no connection with the urethral lumen. We speculate that this cyst may have developed by the accumulation of bloody penile discharge into the cavity formed between the distal and proximal urethral segments that are occluded as a result of infiltration by malignant cells. The imaging configuration of the UR that developed 2 years after the cyst excision was also unusual. The previous surgical intervention to the malignant tissue might have contributed to the development of this complex cystic pattern. Our case shows that the imaging spectrum of UR after radical cystectomy may be much wider and may include cystic and complex patterns, as presented by our patient.

Due to the lack of sufficient comparative studies in the literature on treatment methods and survival rates, an established algorithm for the management of UR cases following radical cystectomy has not yet been introduced. According to the meta-analysis reported by Li *et al*., the treatment of these cases is generally based on the pathologic staging of the recurrent urothelial tumor.[1] The most common treatment method of cases with invasive recurrent urethral tumors, like that of our case, is urethrectomy occasionally accompanied by chemotherapy or radiation therapy.[7-9] In some specific cases, other treatments such as transurethral resection, penectomy, and emasculation may be performed. BCG administration is a treatment choice for urethral tumors diagnosed at early pathological stages. And for patients with a high risk for UR, prophylactic urethrostomy is a recommended preventive treatment.[1]

CONCLUSION

According to the previous reports, UR characteristically presents as a focal intraluminal mass, urothelial wall thickening, or infiltrating mass arising from the urethra on imaging studies. However, the imaging spectrum of UR after radical cystectomy may be much wider and may include cystic and complex patterns.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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