Oncology

Bladder neck necrosis resulting in fistulae to rectum and bilateral thighs post radical prostatectomy and salvage radiotherapy

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A R T I C L E   I N F O

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A B S T R A C T

Salvage radiotherapy (SRT) is a widely used treatment option for patients demonstrating biochemical recurrence post radical prostatectomy. Urologists are familiar with common adverse effects of SRT, such as voiding and erectile dysfunction. In rare instances, more devastating complications can occur. We report a case of bladder neck necrosis following SRT resulting in urethrorectal fistula, fistulae extending into bilateral thighs, and infectious osteomyelitis (OM) of the pubis symphysis. Although rare, this case highlights the severity of complications that can occur following SRT, as well as the surgical management of such complications.

Introduction

Recent evidence suggests close prostate specific antigen (PSA) surveillance with use of salvage radiotherapy (SRT) in patients with biochemical recurrence post radical prostatectomy. Salvage radiotherapy is accompanied by a vast range of potential adverse effects including voiding and erectile dysfunction. Although rarely reported, a minority of patients can develop debilitating fistula formation, infectious osteomyelitis (OM), or radiation necrosis (RN).

Case presentation

A 58-year-old male presented with PSA 31.4 ng/mL and a firm prostate. Standard 12-core transrectal biopsy identified Gleason 9 (4 + 5) disease, 12/12 cores positive, with 90% core involvement. Staging work-up included a negative bone scan; CT imaging revealed an enlarged right obturator lymph node (9 x 10 x 9 mm).

Following multidisciplinary tumor board discussion, radical prostatectomy with pelvic lymph node dissection was completed. Postoperative recovery was initially complicated by disruption of the bladder neck anastomosis causing retroperitoneal urinoma and warranting revision of anastomosis on postoperative day 3. The patient subsequently convalesced without further issue. Foley catheter was maintained for 4 weeks postop and removed following negative CT collection within the right adductor muscles. Aspiration culture grew Staphylococcus epidermidis, Lactobacillus gasseri, and Bifidobacterium bifidum. The patient was started on empiric Ciprofloxacin/ Metronidazole.

Final surgical pathology revealed pT3b N1 M0 R1 PCa with single positive lymph node within the right obturator chain, Gleason 7 (4 + 3), tertiary pattern 5, focal intraductal carcinoma, perineural invasion, and lymphovascular invasion. Positive margin was noted along the left posterior prostate. PSA remained detectable post-operatively and the patient was started on androgen deprivation therapy. A recurrent bladder neck contracture, initially delayed plans for SRT, was stabilized following bladder neck incision. Salvage RT consisting of 6600 cGy over 33 fractions began at 17 months postoperatively. ADT was discontinued after 24 months with PSA remaining undetectable. The patient continued to void well.

At 42 months postoperatively the patient reported prolonged voiding and new onset of urine leakage per rectum. Cystoscopy revealed slight bladder neck contracture which was easily dilated to 16F. Retrograde urethrogram was negative for extravasation. Urgent CT urogram with voiding cystourethrogram identified urethrocrotal fistula with contrast extravasation into rectum at the level of the membranous sphincter. Following a thorough discussion, the patient elected conservative therapy as there was minimal urine per rectum. A suprapubic catheter was positioned and the patient became dry.

Six weeks later, the patient presented with right medial thigh pain precipitated by heavy lifting. A repeat CT showed intramuscular abscess collection within the right adductor muscles. Aspiration culture grew Staphylococcus epidermidis, Lactobacillus gasseri, and Bifidobacterium bifidum. The patient was started on empiric Ciprofloxacin/ Metronidazole.

Serial imaging over 4 weeks revealed increased size of the right leg...
abscess warranting percutaneous catheter insertion. Repeat culture revealed Candida glabrata and Candida dubliniensis warranting Caspofungin. Fluid creatinine testing was positive proving urinary extravasation. Further characterization via CT cystogram confirmed progressive degradation to the bladder neck with increased patency of the urethrectal fistula, and new anterior bladder neck fistula extending under the pubic symphysis into bilateral medial thighs (Fig. 1). A small left medial thigh collection was contained with percutaneous catheter. The patient continued to insist on conservative therapy.

Unfortunately, the patient experienced rapid clinical decline over the subsequent 5 days re-presenting with lethargy and immobility. Crepitus was now felt along the medial thigh. CT cystogram revealed new osteomyelitis of the pubic symphysis (Fig. 2), marked air within the left adductor muscle complex tracking to the knee and suspected necrotizing fascitis (Fig. 3). He was taken emergently to the operative room. Bilateral thigh exploration revealed absence of muscle or tissue necrosis but significant purulence warranting washout and placement of bilateral vacuum dressings. Laparotomy revealed a fixed pelvis which prevented pelvic exenteration. Cystotomy exposed a necrotic appearing bladder neck. A supra-trigonal radical cystectomy with ileal conduit urinary diversion and high diverting colostomy were completed. As the urethrectal fistulae could not be resected a large flap of omentum was mobilized and secured to occlude the fistula tract.

Following transient ICU, the patient convalesced without issue. Piperacillin/Tazobactum was continued for 6 weeks. He was discharged home 4-weeks postoperatively in full ambulatory condition. Follow-up imaging revealed resolution of both OM and bilateral thigh abscesses. Final pathology was consistent with radiation necrosis of the bladder neck and excision of the anterior fistula tract.

Discussion

While some adverse effects of SRT (erectile dysfunction, urethral stricture) are well documented, clinical reports of OM, delayed fistula formation, or bladder neck necrosis are rare. To our knowledge this is the first case report of a patient who developed urethrectal fistula, pubic symphysis OM, and fistulae/abscesses of bilateral adductor muscle compartments secondary to radiation necrosis following salvage external beam radiation therapy.

Trubiano et al. described a similar complication of RN, pubic symphysis OM, and bilateral adductor abscesses secondary to fistula formation. However, their patient received brachytherapy followed by a transurethral resection of the prostate. Gupta et al. described 10 patients treated for PCs who developed pubic symphysis OM. All patients received radiation therapy, either as primary or secondary treatment for PCs. Most patients presented with complaints of pelvic and supra-pubic pain or recurrent urinary infections, and three were found to have either gluteal or pelvic abscesses. All patients were treated with broad-spectrum antibiotics and the majority underwent simple cystectomy with urinary diversion and debridement of the abscess cavity.
Most recent reported cases of RN seem to involve high dose stereotactic radiosurgery used during treatment of brain metastases. Total radiation dose, volume of irradiated area, and fractionation regimen are recognized as the main predictive factors. However, the underlying pathophysiology of RN and irreversible tissue injury remains unclear. Due to the paucity of reports within the urological literature, current evidence does not allow prediction of patients at high risk of developing late devastating complications of SRT. Management of these patients can be challenging, often requiring acute surgical intervention with prolonged antimicrobial therapy to provide appropriate resolution and quality of life.

Conclusion

Late complications of salvage radiotherapy can include osteomyelitis, fistula formation, and bladder neck necrosis. These complex and debilitating complications may present clinically as vague pubic or thigh pain. If recognized and treated in a timely manner satisfactory outcomes are possible.

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