



Trauma and reconstruction

## Mature rectovesical fistula after salvage cryotherapy; A rare complication following treatment for locally advanced prostate cancer

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### ARTICLE INFO

#### Keywords:

Prostate cancer  
Cryotherapy  
Rectovesical fistula

### ABSTRACT

A rectovesical fistula is an abnormal connection between the bladder and rectum. A rectovesical fistula is a theoretical, but rarely documented phenomenon following locally advanced prostate cancer treatment (radiation therapy, cryotherapy, etc.). Here, we present a case report of a mature rectovesical fistula thirteen years after the patient was treated with radiation therapy and salvage cryotherapy for locally advanced prostate cancer and the various treatment options.

### 1. Introduction

Urinary tract fistulas are observed in a multitude of settings, varying in terms of location, etiology, disease processes, morbidity, and management. Given the broad nature of urinary tract fistulas, management can be daunting, especially in the setting of radiated tissue. Often, patients with history of pelvic radiation or ablative therapy are significantly more likely to need permanent urinary and fecal diversion when compared with other urinary tract fistula etiologies.<sup>1</sup> Local recurrence of prostate cancer after radiation can be treated with cryotherapy in select patients. However, urinary tract fistulas are a feared complication, with some estimates ranging from 1 to 3.4 % pertaining to rectourethral fistulas specifically after salvage cryotherapy.<sup>2</sup> This is a case report describing an atypical presentation of a rectovesical fistula in a patient previously treated with radiation therapy and salvage cryotherapy for locally advanced prostate cancer.

### 2. Case presentation

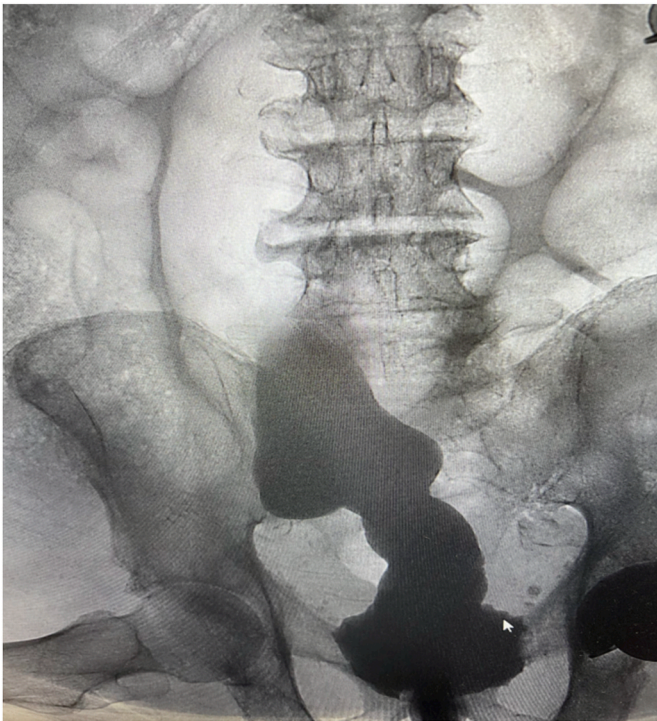
Patient is an 85-year-old male with a history of cT2A N0 M0 prostate cancer treated first with combination therapy of androgen deprivation therapy and 80 Gy of external beam radiation therapy in 2005. Subsequently, the patient was found to have a rising PSA and underwent salvage cryoablation of the prostate in 2010. During this procedure, 6 cryoprobes were placed in the prostate and he underwent 2 freeze cycles lasting 9 minutes and 19 seconds and then 8 minutes and 31 seconds. Patient tolerated the procedure well and continued to be monitored annually with PSA examinations.

In June of 2023, the patient presented to the hospital with knee pain, difficulty ambulating, and weakness. On admission, the patient complained of urinary hesitancy, stranguria, and sensation of incomplete emptying. He denied urinary urgency, frequency, dysuria, hematuria, pneumaturia, or fecaluria. Incidentally in the Emergency Department, the patient had a computed tomography scan of the abdomen and pelvis performed, which showed an obstructing left uretero-vesicular calculus with upstream hydronephrosis. He was taken to the operating room the following day for cystoscopy, cystolitholapaxy and attempted left ureteral stent placement. Intraoperative findings at this time revealed that the prostate had significant necrotic/fibrous tissue, dystrophic calcification and an abundance of bladder calculi that were completely obscuring the ureteral orifices. Since the left ureteral orifice could not be located, Interventional radiology was consulted and placed a left nephrostomy tube.

Due to significant bladder calculi burden, the decision was made to take the patient back to the operating room for a staged cystolitholapaxy. During the first procedure, there was significant burden of bladder calculi adhered to necrotic prostatic tissue. The left ureteral orifice again could not be visualized. An antegrade nephrostogram showed moderate hydronephrosis with no contrast passing distal to the ureteropelvic junction. One week later, the patient was again taken back to the operating room for cystolitholapaxy. After removing all stone burden from the bladder and prostate, a large opening was revealed on the posterior bladder wall. To evaluate this finding, a retrograde cystogram was performed (Fig. 1), which showed contrast extravasation from the bladder into an enteric appearing structure. Next a digital rectal exam was performed under direct cystoscopic visualization. This

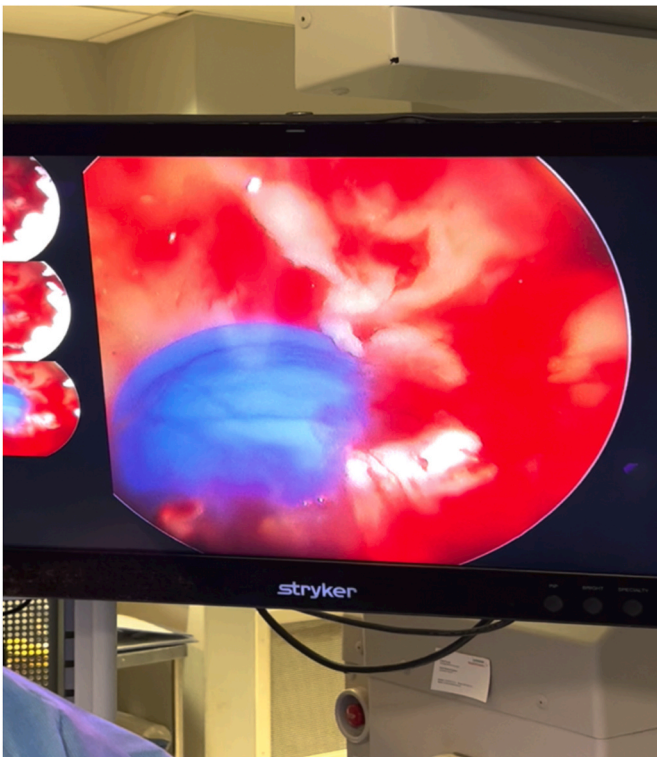
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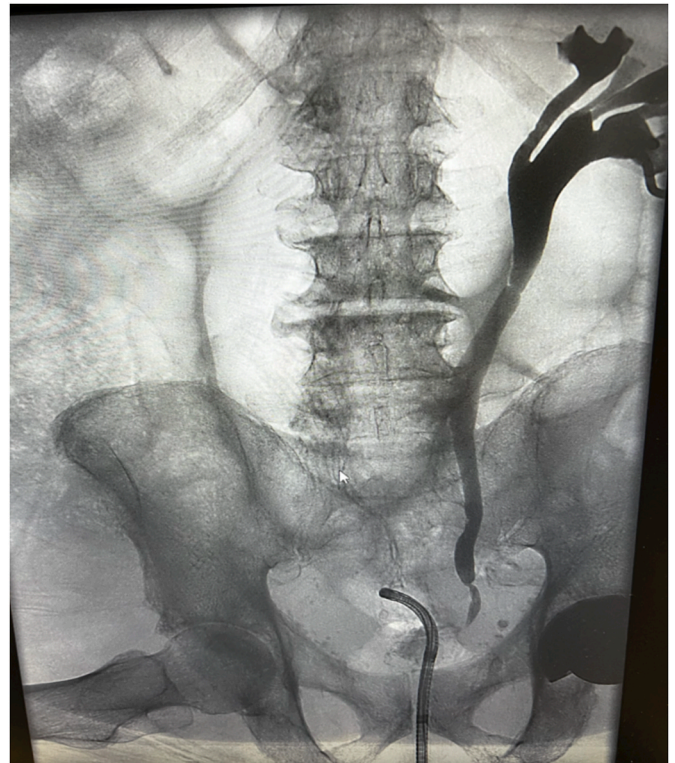


**Fig. 1.** Retrograde cystogram after clearing bladder calculus burden showing contrast extravasation from the bladder into the rectum and sigmoid colon.

revealed the tip of the index finger in the urinary bladder (**Fig. 2**), confirming the findings of a large, mature rectovesical fistula that had previously been occluded by the patient's large stone burden. Antegrade nephrostogram was again performed using both contrast and methylene blue. No contrast could be seen distal to the uretero-vesicular junction



**Fig. 2.** Endoscopic view of mature rectovesical fistula with tip index finger inserted from the rectum visualized in the bladder.



**Fig. 3.** Left antegrade nephrostogram after the left ureteral orifice could not be directly visualized, which showed moderate hydronephrosis with calyceal blunting and no contrast traversing the distal ureter.

(**Fig. 3**). There was no visualized methylene blue in the bladder. At this time, a 22F urethral catheter was inserted into the bladder and the procedure was terminated.

Post-operatively, the patient began to have episodes of fecaluria. He was transitioned to a low-residue diet and his catheter required periodic irrigation. Due to the intraoperative findings, post-operative fecaluria, and concern for sepsis in the future, general surgery was consulted for evaluation and ultimately took the patient for end-loop colostomy. To maximize urinary drainage, he underwent right sided nephrostomy tube insertion. His Foley catheter was removed and he was discharged in stable condition.

### 3. Discussion

Salvage cryotherapy remains a possible treatment option for recurrent prostate cancer after radiation therapy. Lian et al. evaluated 32 patients over 4 years with locally recurrent prostate cancer after radiation therapy who underwent salvage cryoablation. They found a 5-year overall survival of 92.3 % and a 5-year cancer-specific survival of 100 %. Furthermore, they reported no severe grade 3 events in these patients, which includes rectourethral and rectovesical fistula.<sup>3</sup>

Although the findings of rectovesical fistula has rarely been reported in the literature, there have been documented cases of rectourethral fistula formation following whole gland cryotherapy. Aminsharifi et al. examined 4102 men who underwent primary whole gland cryotherapy for prostate cancer. They found a rate of rectourethral fistula formation to be 1.2 %. Furthermore, they found that patients with urinary retention, Gleason score  $\geq 7$ , and preoperative urinary incontinence were features associated with rectourethral fistula formation.<sup>4</sup>

Regarding treatment of rectourethral and rectovesical fistulas. There are three main treatment categories: conservative treatment, colostomy with or without surgical closure, or primary surgical closure without colostomy. Conservative treatment consists of urinary diversion and

residue free diet. Definitive/curative surgical treatments include abdominal approaches, perineal approaches, or trans sphincteric approaches according to the York-Mason technique with flap interposition.<sup>5</sup>

In the case presented above, the patient was managed with a combination of conservative treatment and end colostomy. This was due to the maturity of the fistula, the patient's medical co-morbidities, the possible need for further prostate cancer intervention and the patient's goals of care. At post-operative follow-up after discussion of definitive surgical treatment versus conservative treatment, the patient elected to undergo bilateral nephrostomy tube exchanges every three months and maintaining the end colostomy for fecal diversion.

#### 4. Conclusion

Rectovesical fistula is a rare and potentially dangerous complication following locally advanced treatment for prostate cancer (radiation therapy, cryotherapy, etc). The diagnosis and treatment are complicated, and one must account for a plethora of factors including further need for cancer treatment and maturity of the fistula. This case report demonstrates a rare presentation for this disease as well as the diagnostic work-up and treatment options.

#### Funding sources

This research did not receive any specific grant from funding agencies in the public, commercial or not-for-profit sectors.

#### Declaration of competing interest

None.

#### References

1. Linder BJ, Umbreit EC, Larson D, et al. Effect of prior radiotherapy and ablative therapy on surgical outcomes for the treatment of rectourethral fistulas. *J Urol*. 2013;190(4):1287–1291.
2. Pisters LL, Rewcastle JC, Donnelly BJ, et al. Salvage prostate cryoablation: initial results from the cryo on-line data registry. *J Urol*. 2008;180(2):559–564.
3. Lian H, Yang R, Lin T, et al. Salvage cryotherapy with third-generation technology for locally recurrent prostate cancer after radiation therapy. *Int Urol Nephrol*. 2016;48(9):1461–1466.
4. Aminsharifi A, Polascik TJ, Schulman A, et al. Predictors of rectourethral fistula formation after primary whole-gland cryoablation for prostate cancer. *J Endourol*. 2018;791–796.
5. Prudhomme T, Lunardi P, Thoulouzan M, et al. Management of rectourethral fistulas after radical prostatectomy: a university hospital experience. *Clin Surg J*. 2021;2(1):1–8.