

A rare bladder diverticulum cancer and concomitant prostate adenocarcinoma case report

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Abstract. This report presents the case of a 65-year-old male diagnosed with two concomitant cancers: transitional cell carcinoma within bladder diverticulum (G3, pTa) and prostate adenocarcinoma cT2bN0M0 (Gleason 7 (3+4)). Due to specific location of the bladder cancer (within diverticulum) and the concomitant prostate adenocarcinoma, we decided to perform a single surgery to treat both diseases: 3D Laparoscopic cystoprostatectomy with pelvic lymphadenectomy and ileal conduit. Diverticulum bladder urothelial carcinoma in situ (pTisN0MxL0V0R0) and acinar prostate adenocarcinoma Gleason 7 (3+4) (pT2bN0MxL0V0R0), both with surgical negative margins, and 21 negative lymph nodes were reported in pathology. Seric PSA follow-up was undetectable 1 month after surgery. Clinical and therapeutic management of this disease are also discussed.

Key Words: laparoscopic, cystoprostatectomy, ileal conduit, intradiverticular bladder cancer, prostate adenocarcinoma

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Introduction

Transitional cell carcinomas of bladder diverticulum are rare and behave like bladder transitional cell carcinomas elsewhere. The overall prevalence of malignant tumors within a bladder diverticulum has been reported as ranging from 0.8% to 10% (Rovner et al 2016).

The finding of a cancer within a bladder diverticulum has particularly important diagnostic and therapeutic considerations because the wall of bladder diverticulum lacks a well-developed muscularis propria layer. Consequently, such a finding may predict a poorer prognosis for the reason that the potential for rapid transmural involvement of invasive bladder cancer and extravesical extension is higher (Rovner et al 2016).

Prostate cancer is the second most commonly diagnosed cancer in men with an estimated 1.4 million diagnoses worldwide in 2020, accounting for 15% of all cancers diagnosed (Mottet et al 2021).

Smoking is the most important risk factor for bladder cancer, accounting for 50% of cases. Smoking is also a risk factor for developing prostate cancer.

In this report, a rare case of transition cell carcinoma located in a bladder diverticulum and a concomitant prostate cancer is presented.

Case presentation

A 65-year-old male patient, a chronic smoker, presented to the Urology department for nycturia and weak stream. A digital

rectal examination (DRE) was performed and revealed a suspicious right lobe nodule (cT2b). The prostatic-specific antigen (PSA) showed an elevated value (13.5 ng/ml). A multiparametric MRI (mpMRI) was done and it showed a 22 mm T2-hypointense lesion, hyperintense on DWI, localized in the anterior transitional zone (TZa) and anterior fibromuscular stroma (AFMS) of the right prostatic lobe, classified as PI-RADS 5. MRI-TRUS Fusion prostatic biopsy was performed. Histology came Gleason 7 (3+4) acinar adenocarcinoma, grade 2 (WHO 2016) on 5+ of 16 specimens (34 mm of 179 mm), without extraprostatic extension or angiolymphatic invasion. The patient was planned for radical prostatectomy. Due to COVID-19 pandemic the surgery was postponed. Meanwhile, the patient suffered a NSTEMI that required further postponement. Computer tomography was performed for staging. Two bladder diverticula (55/27 mm on left lateral-posterior wall and 12/6 mm on lateral-posterior right wall) were described. A bladder mucosal lesion consistent with tumor of the bladder was also identified within one the bladder diverticulum. There was no evidence of lymphadenopathy. Bone scan was negative. A transurethral resection of the intradiverticular bladder tumor was performed. Histology examination showed a papillary TCC, grade 3, stage pTa which places the disease in a very high-risk group.

We recommended and performed 3D laparoscopic cystoprostatectomy with pelvic lymphadenectomy and ileal conduit. The histology revealed urothelial carcinoma in situ pTisN0MxL0V0R0 and a Gleason 7 (3+4) acinar prostatic adenocarcinoma, grade 2 (WHO 2016) pT2bN0MxL0V0R0. The 21 removed lymph

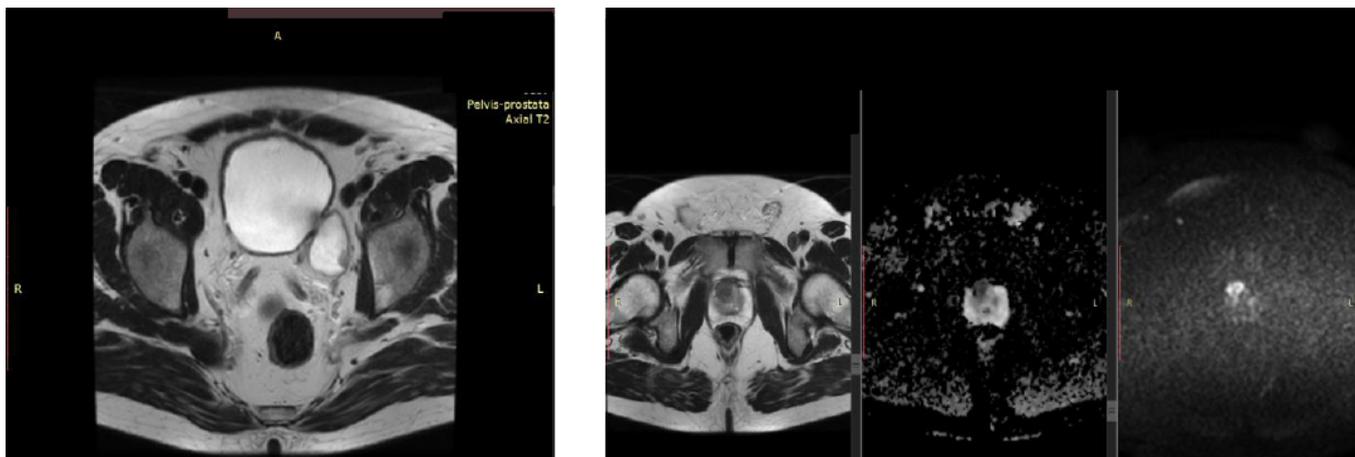


Fig. 1. Magnetic resonance imaging scan shows on the left a bladder diverticulum on the left lateral-posterior wall with a tumor (11/7 mm). On the right, magnetic resonance imaging scan demonstrates a 22 mm, T2-hypointense lesion, hyperintense on DWI, localized in the anterior transitional zone (TZa) and anterior fibromuscular stroma (AFMS) of the right prostatic lobe, classified PI-RADS 5.

nodes were free of tumor. The margins were clear of disease. The postoperative period was uneventful. Seric PSA follow-up was undetectable 1 month after surgery. Six months postoperatively, the patient is alive and free of disease.

Discussions

Smoking is the most important risk factor for bladder cancer, accounting for 50% of cases. The risk increases with duration of smoking and intensity of smoking. (Raheem et al 2011). Furthermore, smoking is also a risk factor for prostate cancer. Current cigarette smoking was associated with an increased risk of prostate cancer death (RR: 1.24, 95% CI: 1.18–1.31) and with aggressive tumor features and worse prognosis, even after cessation (Babjuk et al 2021). The patient has been smoking 20 cigarettes a day for approximately 50 years resulting in an increased risk of developing both types of cancer.

Taking into consideration the incidence of both types of cancers, the case presented, in which two concomitant diseases arise, is a rare finding. Prostate cancer is second most frequent cancer diagnosis made in men (after lung cancer), with an estimated 1.4 million diagnoses worldwide in 2020, accounting for 15% of all cancers diagnosed (Mottet et al 2021), and the fifth leading cause of death worldwide (Rawla et al 2019). On the other hand, urothelial carcinoma in bladder diverticula is a rare disease. The incidence of bladder diverticulum varies from 1.7% to 13%. They can be classified into congenital and acquired. The prevalence of bladder diverticulum is more common in men as compared with women (31.6% vs. 9%). Shakeri reported that the rate of bladder diverticulum in patient with BPH is 48%. The latter occurs as a result of increased intravesical pressure secondary to bladder outflow obstruction (Hung-En et al 2016). The patient had LUTS (nycturia, low stream) that is a risk factor of developing diverticula. The risk of malignancy in bladder diverticula has been reported to be elevated. This increased risk of bladder cancer in diverticula has been attributed to urinary stasis and to chronic inflammation. Forty-five percent to 80% of bladder diverticulectomy specimens will harbor inflammatory changes to the urothelium. The overall prevalence of malignant tumors within a bladder diverticulum has been reported

as ranging from 0.8% to 10% (Rovner et al 2016). However, the prevalence may be falsely high because many diverticula remain undiagnosed in lack of symptoms. The most common histologic type of malignancy seen within bladder diverticula is transitional cell carcinoma in approximately 70% to 80% of cases, followed by squamous cell carcinoma in 20% to 25% of cases (Rovner et al 2016).

Analyzing the data, the prevalence of these two concomitant diseases is very rare. It ranges from 0.38% to 4.7%.

A neoplasm within a bladder diverticulum has significant diagnostic and disease management considerations because bladder diverticulum wall has a poor-developed muscularis propria layer. The lack of muscular fibers in a diverticulum allows tumor to invade faster and easily in the perivesical tissue and distant metastasis. These issues provide a poor prognosis and calls for a more radical approach. Current guidelines on BC management do not state clear recommendations regarding treatment of bladder diverticulum carcinoma, except for the guideline of the French Association of Urology. In this guideline, partial cystectomy with lymph node dissection is described as a treatment option for unifocal tumors confined to a bladder diverticulum, without concomitant CIS and with a maximum stage of cT3 (Voskuilen et al 2020).

The controversy between radical cystectomy (RC) and partial cystectomy (PC) has been discussed in the literature. A multi-center analysis of characteristics and clinical outcomes of urothelial carcinoma in bladder diverticula showed no significant differences in clinical and pathological characteristics between PC and RC groups. The study showed a five-year overall survival of the entire cohort (n=115) was 63%, stratified by pT stage, 5-yr OS was 86% for patients with <pT2 UCBD (n=39) and 51% for patients with pT2 UCBD (n = 76, p = 0.001). Five-year OS after RC and PC was 62% and 66%, respectively. Pathological upstaging from organ-confined to extradiverticular disease was frequent: 55% of patients who were staged cTa/is/1 by TUR had T2 disease in the RC or PC specimen (Voskuilen et al 2020). Considering the upstaging risk, treatment decision should be taken carefully.

The patient was classified in Intermediate-risk (ISUP 3 / cT2b) PCa group. Active treatment mostly benefits patients with

intermediate- or high-risk PCa and longest expected survival. However, active surveillance was being evaluated as a management strategy in younger patients with low-volume, low- or intermediate-grade (up to Gleason score 3+4 =7) tumors to avoid or to delay treatment that might not be immediately necessary. The ProtecT study showed that after 10 years of follow-up, CSS was the same between those actively treated and those on AM (99% and 98.8%, respectively), as was the OS. Only metastatic progression differed (6% in the AM group as compared to 2.6% in the treated group). The key finding was that AM was as effective as active treatment at 10 years, at a cost of increased progression and double the metastatic risk. Fifty-six percent of patients had low-risk disease, with 90% having a PSA < 10 ng/mL, 77% ISUP grade 1 (20% ISUP grade 2–3), and 76% T1c, while the other patients had mainly intermediate-risk disease. Beyond 10 years, no data is available (Loeb *et al* 2016). In localized disease, over 10 years life expectancy, as in this case, is considered mandatory for any benefit from local treatment (Mottet *et al* 2021). Individual life expectancy, health status, frailty, and co-morbidity, not only age, should be central in clinical decisions on screening, diagnostics, and treatment for PCa. Furthermore, the patient has chosen the active treatment. Prostatectomy can be performed by open-, laparoscopic- or robot-assisted (RARP) approaches. The concomitant prostate cancer and carcinoma within bladder diverticulum, also the great experience of the surgical team on 3D laparoscopic surgery and the limitation of equipment (the absence of Robot-assisted approach) had made us choose the 3D laparoscopic cystoprostatectomy with pelvic lymphadenectomy and ileal conduit as treatment.

Conclusion

Bladder diverticulum carcinoma is a rare and challenging disease for which there are no guidelines for therapeutic management. Reviewing the literature and taking into consideration the concomitant prostate cancer, we believe that the radical cystectomy approach was the right treatment option. Future prospective large studies are needed to conceive clear systematic guidelines on bladder diverticulum carcinomas.

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Citation Cojocariu VI, Andras I, Stanca DV, Imola DM, Ionescu C, Telecan T, Medan SA, Crisan N. A rare bladder diverticulum cancer and concomitant prostate adenocarcinoma case report. *HVM Bioflux* 2022;14(2):106-109.

Editor Antonia Macarie

Received 18 March 2022

Accepted 25 May 2022

Published Online 27 May 2022

Funding None reported

**Conflicts/
Competing
Interests** None reported