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CASE REPORT

A case of visible diffuse peritoneal Bacillus Calmette-Guérin infection at the time of planned radical cystectomy

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Introduction

Intravesical instillation of Bacillus Calmette-Guérin (BCG), an attenuated strain of Mycobacterium bovis, is used in treatment of non-muscle invasive bladder cancer. Common local side effects are hematuria, dysuria, urgency and frequency. Systemic side effects and BCG infection (BCG-itis) are rare with a plethora of reported infection sites r [1]. Peritoneal BCG infection has been reported in few cases [1–3] presenting with ascites, fever and abdominal pain [2]. We present a case of peritoneal BCG infection found visually at laparotomy and verified by polymerase chain reaction (PCR).

Case report

A 77-year-old man was scheduled for radical cystoprostatectomy (RC) for muscle-invasive urothelial carcinoma that had progressed from carcinoma *in situ* (CIS). Previous medical history included hypertension, atrial fibrillation, aortic stenosis, diabetes, transitory cerebral ischemia, and brachytherapy for prostate cancer 12 years prior. He was a previous smoker. There was no history of liver disease, drug use, previous tuberculosis or travel to high-risk areas.

Two years before planned RC, the patient presented with macroscopic hematuria, dysuria, urgency and frequency. A diagnosis of CIS of the bladder was made at transurethral resection (TURBT). Induction treatment with 6 instillations of BCG was prescribed, with some doses cancelled due to local side effects, and re-induction started after three months due to persistent CIS. Biopsies after re-induction treatment showed a small focus of CIS. Cystectomy was discussed, but the patient opted for another trial of BCG. Maintenance treatment was not tolerated. A small focus of Ta high grade was noted during follow-up and resected. For the following year, cystoscopy and cytology every 4 months showed no recurrence. A suspicious erythematous lesion was biopsied one year after the last BCG instillation, after which the patient presented with abdominal pain and fever. A small retroperitoneal perforation of the bladder was noted and resolved with a Foley catheter for two weeks. Biopsies showed chronic inflammation, not indicative of a BCG ulcer [4]. During the following months, the patient had an unintentional weight loss of 20 kg due to loss of appetite, malaise and fatigue and had hospital admissions at other institutions for persistent diarrhea, pneumonia and atrial fibrillation. Plain chest x-ray was inconspicuous.

At next planned follow-up, cystoscopy revealed a tumor in the bladder neck. Thoracoabdominal CT now showed bilateral hydronephrosis but no sign of metastases. TURBT revealed muscle-invasive urothelial carcinoma. By this time, the patient no longer complained of pain or malaise, reported a stable weight, and was back to normal physical activity.

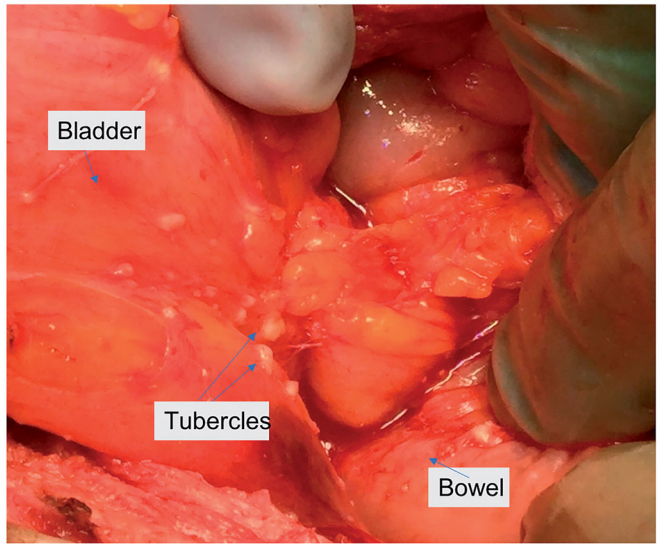

Figure 1. First laparotomy at planned cystoprostatectomy, posterior aspect of bladder and bowel with inflammation and tubercles.

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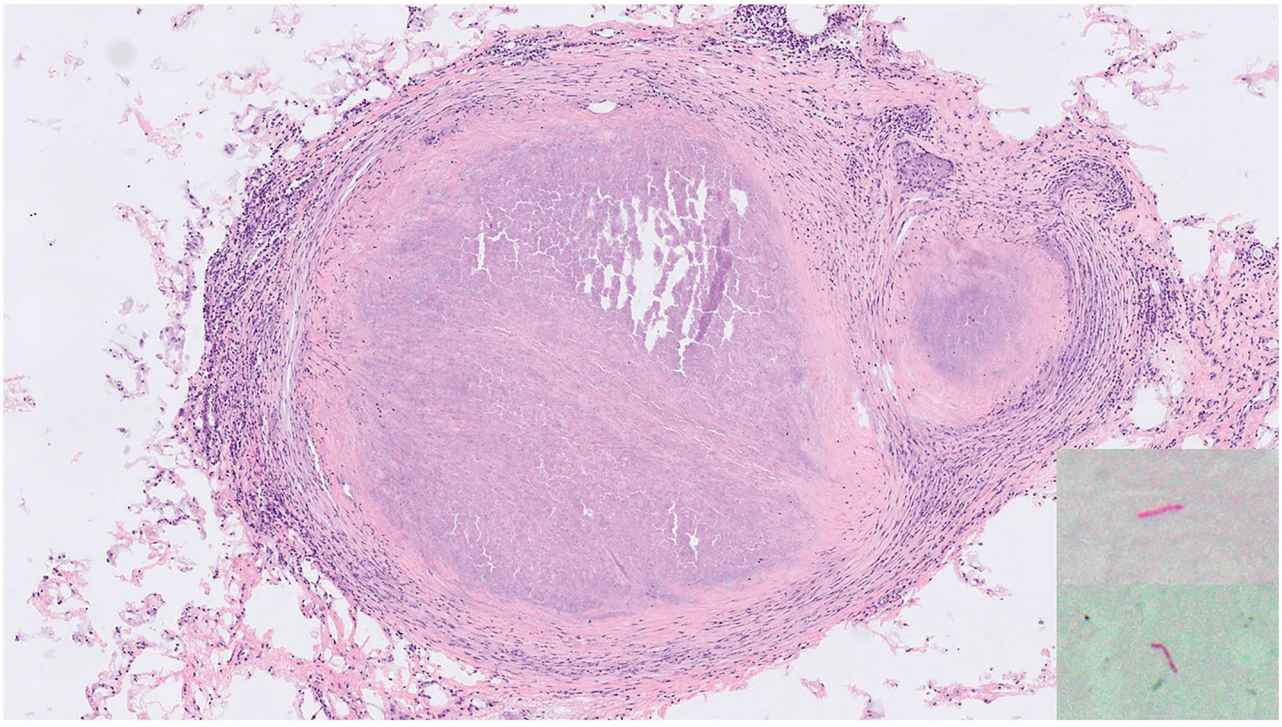

Figure 2 . Histology of peritoneal tubercle biopsied at planned cystoprostatectomy. Positive Ziehl-Neelsen staining of acid-fast bacilli in the lower right corner.

An open radical cystoprostatectomy with an ileal conduit was planned. At admission, the abdomen was indolent. Laboratory tests showed a hemoglobin level of 6.5 mmol/L, leucocytes 12.1×10^9/L and estimated glomerular filtration rate (eGFR) 51 mL/min1.73m^2. At laparotomy, numerous 2–7 mm firm white nodules were found scattered over the peritoneum of the small bowel, colon and bladder, along with severe inflammation in the surgical field. Peritoneal carcinosis or BCG-itis was suspected. Several lesions were biopsied, revealing a granular white substance inside the elements. Frozen section of the biopsies showed nonmalignant small nodules of necrosis with peripheral, discrete granuloma formation representing necrotizing, granulomatous inflammation indicative of mycobacterial infection. As numerous nodules were noted on the small bowel that was to be used for the ileal conduit, the decision was made to postpone RC till after further work-up and possibly treatment.

Ziehl-Neelsen staining was positive for acid-fast bacilli and PCR confirmed that the tissue elements were positive for Mycobacterium TB complex, of which M. bovis is a member. BGG-itis was considered the most plausible diagnosis after taking patient history into account. M. bovis eradication treatment was started with rifampicin, isoniazid and ethambutol. RC was carried out after 6 weeks of treatment, with severe inflammation still present, but the nodules had visibly regressed. The patient was discharged with no major complications. Final pathology of the bladder showed pT4a urothelial carcinoma and necrotizing, granulomatous inflammation of the bladder peritoneum.

Discussion

We describe a rare case of diffuse peritoneal BCG-itis uncovered at planned radical cystoprostatectomy for bladder cancer. In retrospect, weight loss and malaise could have led to a suspicion of BCG-itis. As peritoneal tubercles usually will not be noted on imaging studies, we suggest that this can be considered as a differential diagnosis in cases of suspected BCG-itis with no obvious focus. In this case, delaying cystoprostatectomy until the patient was treated for 6 weeks with anti TB medication minimized the visible peritoneal lesions. We report this case for future reference, as it is unlikely that solid evidence to support treatment plans will emerge.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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