Incidentally-Discovered Squamous Cell Carcinoma after Endoscopic Sphincterotomy

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Key Words

Bladder cancer • Catheterization complication • Cystoscopy • Spinal cord injury • Squamous cell carcinoma

Abstract

The association between the development of bladder cancer and chronic bladder irritation is well established in the literature. Chronic urinary tract irritation can be the result of bacterial infections, foreign bodies, trauma of repeated catheterization, neurogenic bladder, urolithiasis, or chronic bladder outlet obstruction, all which have been implicated in the pathogenesis of non-bilharzial squamous cell carcinoma of the bladder (SCC). With many of the aforementioned factors present in patients with spinal cord injury, several retrospective studies have demonstrated a 16–28 fold increased relative risk of bladder cancer, with SCC accounting for 10 times more cases of bladder cancer compared to the general population. In this report, we present the case of incidentally-discovered SCC of the bladder found within sphincter/prostate chips of a patient with neurogenic bladder due to spinal cord injury on clean intermittent catheterization who underwent sphincterotomy with negative cystoscopic findings.

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Introduction

The association between the development of bladder cancer and chronic bladder irritation is well established in the literature. Chronic urinary tract irritation can be the result of bacterial infections, foreign bodies, trauma of

repeated catheterization, neurogenic bladder and bladder calculi, or chronic bladder outlet obstruction, all which have been implicated in the pathogenesis of non-bilharzial squamous cell carcinoma of the bladder (SCC). SCC is a relatively uncommon tumor with a dismal prognosis, accounting for only 1.2–4.5% of all bladder primary tumors in the Western populations [1]. With many of the aforementioned factors present in patients with spinal cord injury (SCI), several retrospective studies have demonstrated a 16–28 fold increased relative risk of bladder cancer [2–4], with SCC accounting for 10 times more cases of bladder cancer compared to the general population [5, 6]. In this report, we present the case of incidentally-discovered SCC of the bladder found within sphincter/prostate chips of a patient with neurogenic bladder due to SCI on clean intermittent catheterization (CIC) who underwent sphincterotomy with negative cystoscopic findings.

Case Report

The patient is a 65-year-old male with T5 complete paraplegia secondary to a gunshot wound occurring during Vietnam War. He had abdominal surgery to remove the bullet, as well as an inflatable penile prosthesis implantation with subsequent removal of the left cylinder in 1991 after it eroded into his urethra. Since his injury, he had been alternating between external and internal catheters and had a long history of intermittent bladder stones and urinary tract infections (UTI). Patient had subsequently learned CIC and performed it for a year prior to presenting to our urology clinic. A urodynamic study demonstrated neurogenic detrusor overactivity with bladder sphincter dyssynergia. He initially presented to our clinic with an *E. coli* UTI and inability to empty his

bladder when full. He denied any issues with passing the catheter, and had been only performing CIC twice a day as he continued to void well on his own. At the time of presentation he underwent a CT abdomen and pelvis which showed a distended bladder along with concentric non-focal wall thickening with no urolithiasis or masses. Flexible cystoscopy visually revealed changes consistent with squamous metaplasia of the trigone with diffuse hyperemia; however, no papillary or nodular lesions were seen. Bladder barbotage was negative. Frequency of CIC was increased to 4 times daily. The patient endorsed leaking between catheterizations during his follow up visit, requiring the use of an external catheter. Since he had elected to wear an external catheter and wanted to avoid CIC, we recommended cystoscopy and elective sphincterotomy. He was admitted for ESBL *e-coli* prior to his planned procedure.

During the procedure, panendoscopy revealed bullous edema along the posterior bladder wall consistent with history of catheterization, with orthotopic ureteral orifices and no tumors or masses. He did appear to have moderately obstructing lateral prostatic lobes which were resected. Sphincterotomy was then performed with an incision extending from the verumontanum to the proximal part of the bulbar urethra.

Histopathological examination of the chips revealed moderately differentiated keratinizing and nonkeratinizing squamous cell carcinoma infiltrating the bladder neck and prostate with focal lymphovascular space invasion. A CT scan revealed bilateral iliac chain lymphadenopathy, diffuse bladder wall thickening along with diffuse rectal wall thickening with adjacent infiltration likely secondary to the bladder process. Biopsies on colonoscopy were negative for malignancy. He subsequently underwent a cystoprostatectomy with an ileal conduit urinary diversion and bilateral lymph node dissection. Intraoperatively, a large mass was seen invading into rectum and urogenital diaphragm. He ultimately underwent a sigmoidectomy with a descending colostomy.

Post-operatively, serial CT scans revealed an enhancing heterogeneous complex mass within the right lower pelvis with extension into the right obturator muscle extending to the subcutaneous soft tissues at the midline aspect of the inferior pelvis, in addition to heterogeneously enhancing metastatic deposits throughout the pelvis and encasing the distal right ureter and inseparable from the ileal conduit.

The patient could not tolerate systemic chemotherapy due to pancytopenia and neutropenic fever and suffered further disease progression and bowel obstruction due to metastatic deposits. He subsequently opted for palliative care and eventually developed sepsis and passed away 10 weeks after his surgery.

Discussion

It is uncertain whether the dismal prognosis of SCC bladder tumors is secondary to a delay in diagnosis, or the aggressive nature of the tumor. While various screening protocols supplementing cystoscopy with cytological or histopathological assessments have been previously proposed to attempt earlier detection of SCC in SCI, it is unclear whether earlier and more frequent cystoscopic evaluation would benefit SCI patients. In a retrospective

study that compared 8 bladder cancer patients with SCI who had survived at least 5 years to 12 SCI controls who had died due to bladder cancer, Groah et al. [7] found that survivors had actually undergone significantly fewer screening cystoscopies and biopsies than in those who died of the disease. Both groups had similar ages when they developed SCI, duration of SCI, age at bladder cancer diagnosis, and time utilizing an indwelling catheter. The proportion that developed SCC was similar for both survivors and controls, at 37.5% and 44%. Instead, survivors were more likely to be nonsmokers, and have a history of squamous metaplasia and papillary cystitis. To date, and possibly owing to the relative scarcity of the disease, none of the proposed screening protocols have been validated or even challenged by other authors [8].

The case we've presented is notable for the patient having no cystoscopic or cytological findings despite extensive local disease with rapid progression. It is therefore unlikely that a cystoscopy-based screening program would have lead to an earlier diagnosis, but rather one based on random bladder biopsies which focuses on areas closer to the bladder outlet where keratinizing squamous metaplasia, a lesion suggested to give rise to SCC in 20–37% of cases [9], is more likely to develop.

Casey et al. [10] reported a review of SCC of the bladder in patients performing CIC. In their review, all 8 cases were associated with an established history of recurrent UTIs or asymptomatic bacteriuria, a well-established risk factor in SCC carcinogenesis. They also noted that keratinizing squamous metaplasia was present in 5 out of 8 cases, but cannot be ruled out in the remaining three.

While the costs and benefits of monitoring SCI patients on catheters or performing CIC remains debatable, we hope this report helps guide the development of an optimal screening protocol in this high risk population.

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