Bladder Leiomyosarcoma: A Rare, but Aggressive Diagnosis

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Key Words

Bladder leiomyosarcoma • Computerized tomography • Hematuria • Ileal conduit • Radical anterior pelvic exenteration

Abstract

It remains evident in the literature that leiomyosarcomas of the bladder have continuously been regarded as highly aggressive tumors associated with a poor prognosis. Immediate surgical therapy by radical cystectomy with wide margins is warranted as an effective treatment modality and has been associated with longer survival rates. Herein, we present the case of a high-grade leiomyosarcoma primarily treated with anterior pelvic exenteration and urinary diversion.

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Introduction

Leiomyosarcoma of the bladder is considered a rare but significant clinical etiology, and is associated with substantial morbidity and mortality if not treated early [1]. There remains a paucity of literature regarding this highly aggressive tumor with less than 200 cases reported to date. Previous studies have reported that leiomyosarcoma of the bladder accounts for 1% of all bladder malignancies.

Case Report

A 77-year-old Hispanic female presented with microscopic hematuria, complaints of dysuria and pelvic pain upon urination. The patient was referred to our urology clinic for further evaluation. Our patient's history was significant for recurrent urinary tract infections following several trials of antibiotic therapy, arthritis, cataracts, and hypertension, controlled with Hydrochlorothiazide 12.5 mg daily. She had a prior surgical history of bilateral breast implant placement and removal following a silicon leak and capsular contracture. No pertinent family or social history was noted and she denied ever smoking or exposure to significant second hand smoke. Our patient emigrated from Columbia, where she worked in a factory making eyeglass frames, without occupational chemical exposure and eventually moved to the USA in 2013. Physical exam revealed an alert and coherent overweight female with no other abnormalities.

The differential diagnosis of the patient's bladder tumor incorporates several etiologies including primary bladder malignancy. Considering the majority of bladder malignancy is comprised of urothelial carcinoma, we carefully investigated our patient history for any associated risk factors. Her occupational history was not found to have any suspicious threat for urothelial carcinoma secondary to chemical exposure including potential bladder carcinogens such as toluidine, aniline, or aromatic amine [1].

Our patient's history was significant for recurrent urinary tract infections which has been associated with the development of bladder cancer, especially invasive squamous cell carcinoma [2]. Patients presenting with chronic cystitis associated with prolonged indwelling stents, bladder calculi, or *Schistosoma hematobium* cystitis, are at increased risk of developing squamous cell carcinoma of the bladder, the most relevant common factor appears to be some form of chronic bladder irritation [1]. Our patient had no past medical history significant for any of the risks mentioned.

Fig. 1. A Coronal CT imaging of the abdomen and pelvis demonstrating a large $6.4 \times 4.8 \times 4.3$ cm irregular heterogeneously enhancing mass of the bladder wall. **B** Gross surgical specimen with a $6.5 \times 4 \times 4$ cm solid tumor located at the dome of the bladder.

Fig. 2. A Interlacing fascicles of markedly atypical spindle cells with increased mitoses. (H&E, 400 $\times$). **B** Tumor cells are positive for smooth muscle antigen. (Immunohistochemical stain with SMA, 400 $\times$) (**A**), and demonstrated increased proliferation index as shown by immunohistochemical stain with Ki 67 (**B**).

Our patient was counseled on the management of her bladder mass, and elective surgery was agreed upon. Transurethral resection of the bladder tumor was performed and tissue specimen revealed a high-grade leiomyosarcoma of the bladder. The patient subsequently underwent radical anterior pelvic exenteration along with creation of an ileal conduit. Her hospital course was uneventful and she was discharged on post-operative day 8 and is currently without evidence of recurrence.

Our surgical specimen showed a gray tan solid tumor with nodular surface measuring $6.5 \times 4.8 \times 4.3$ cm located at the dome of the bladder (fig. 1). Up to 14 mitoses per 10 high power fields are identified, where several areas of tumor necrosis are noted. Immunohistochemical stains show tumor cells are positive for smooth muscle antigen and desmin, and negative for CD34 and CD 117. Staining for the proliferation marker Ki-67 is positive in more than 30% of tumor cells. These findings support a diagnosis of high grade leiomyosarcoma of the urinary bladder (fig. 2).

Discussion

To date, no set standard of care has been established and evidence of the natural history of bladder leiomyosarcoma is lacking. Little is known about the long term survival associated with these tumors. However, bladder leiomyosarcomas suggest a very poor prognosis if not diagnosed early, especially those presenting with an undifferentiated tumor grade, distant metastasis, and treated without surgical therapy [5, 6]. The largest case series to date by Rodriguez et al. [7] describes the overall incidence of leiomyosarcoma of the bladder as approximately 0.23 cases per million, much less than the previously 1% definition.

Patient presentation typically involves dysuria, gross hematuria, or abdominal pain. The most common of these presentations is painless hematuria reported in up to 80% of patients followed by pollakiuria (28%) and dysuria (19%) [8]. Depending on the size of tumor, patients may present with either severe obstructive voiding symptoms or obstructive uropathy.

Risk factors for bladder leiomyosarcoma have not been well established; however there is a stronger disposition in the male elderly population. The age of diagnosis most commonly occurs in patients with a median age of 65, with the highest incidence peaking in the > 70 year old range, similar to our patient. A male-to-female ratio of 1.29:1 has been reported [5, 6]. Interestingly, Hispanics have recently been reported as having the lowest risk of developing leiomyosarcoma of the bladder as compared to Whites and African-Americans [7, 8]. Moreover, an association with the use of cyclophosphamide and leiomyosarcoma of the bladder development has been reported [9, 10]. The overall survival is approximately 46 months with no differences reported between sexes, races, or ethnicity [7].

Current treatment modalities involve aggressive surgical therapy. The most common procedure performed is radical cystectomy with radical pelvic lymph node dissection and creation of an ileal conduit, followed radical cystectomy with pelvic lymph node dissection and

creation of a Studer neobladder and a Mainz neobladder [10]. Patients with locally advanced disease may undergo neoadjuvant therapy, and the most commonly used neoadjuvant regimen is doxorubicin, ifosfamide, cisplatin, adriamycin, and vincristine with favorable outcomes [11].

There is no consensus regarding the prognosis and follow-up of patients diagnosed with leiomyosarcoma of the bladder [8]. Rodriguez et al. [10] report a median overall survival of 46 months with five and ten year cancer-specific survival rates of 47% and 35%, respectively. Interestingly, previous reports by Rosser et al. had a higher disease-specific survival at 5 years of 62.0%.

It remains evident in the literature that leiomyosarcomas of the bladder have continuously been regarded as highly aggressive tumors associated with a poor prognosis. Immediate surgical therapy by radical cystectomy with wide margins is warranted as an effective treatment modality and has been associated with longer survival rates. Herein, we present the case of a high-grade leiomyosarcoma primarily treated with anterior pelvic exenteration and urinary diversion. Although, this entity is seldom diagnosed, it should be included in the differential of any elderly patient presenting with a bladder mass, especially in the absence of significant risk factors such as a positive smoking history.

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