Urology Case Reports 51 (2023) 102593

Contents lists available at ScienceDirect

Urology Case Reports

journal homepage: www.elsevier.com/locate/eucr

Oncology

Muscle-invasive angiosarcoma of the urinary bladder: Case report

Srigita Madiraju [a], Kwabena Nkansah-Amankra [a], Bradley Buck [b], Firas G. Petros [a,*]

[a] Department of Urology, College of Medicine and Life Sciences, The University of Toledo, Toledo, OH, USA
[b] Mercy Health – St. Vincent Medical Center, Toledo, OH, USA

ARTICLE INFO

Keywords:
Angiosarcoma
Urinary bladder
Muscle invasive
Gross hematuria
Case report

ABSTRACT

A 71-year-old male with benign prostatic hyperplasia managed by self-catheterization presented with gross hematuria. A CT scan of abdomen and pelvis demonstrated abnormal bladder appearance with right sided mass and a diverticulum. Patient underwent transurethral resection of bladder tumor. Pathology was significant for high-grade muscle-invasive angiosarcoma. The malignant cells showed positive staining for vimentin and CD31. Given patient's underlying comorbidities and following multidisciplinary discussion, hospice care was pursued. The aim of this case report is to provide an overview on clinical presentation, diagnosis, and current management of this rare entity of genitourinary sarcoma.

1. Introduction

Genitourinary sarcomas are rare comprising of 1–2% of malignant genitourinary tumors. Angiosarcomas are extremely aggressive originating from vascular endothelial cells with few cases recorded in deep soft tissues and parenchymal organs.[1]

Only a handful of cases delineate bladder angiosarcoma, most associated with previous pelvic radiotherapy. One study series included 22 adult patients with primary or locally recurrent genitourinary sarcomas. Three patients had bladder sarcoma; one was followed. The patient presented with hematuria; the diagnosis of angiosarcoma was made by transurethral resection eventually undergoing radical cystectomy but died within 1 year of diagnosis.[2] Currently 5-year survival rate ranges between 10% and 35% secondary to local recurrence and/or distant metastases.[1]

Here we discuss a 71-year-old patient presenting with primary angiosarcoma of the bladder.

2. Case presentation

A 71-year-old male with history of chronic obstructive pulmonary disease, hypertension, congestive heart failure, asthma, cerebral ischemic stroke without residual deficits, atrial fibrillation on rivaroxaban, diabetes mellitus Type II and urologic history of incomplete emptying and bladder dysfunction secondary to benign prostatic hyperplasia on intermittent self-catheterization. Patient developed gross hematuria. A CT scan of abdomen and pelvis without IV contrast (Figs. 1 and 2) showed a lobulated soft tissue mass along the right bladder margin and left 10 cm posterolateral diverticulum with dependent layering calcifications and increased attenuation suggesting blood products.

The patient underwent cystoscopy, clot evacuation, and transurethral resection of bladder tumor (TURBT) incorporating deep muscle-tissue. The tumor was greater than 5cm and unable to be entirely resected due to concern of invasion through muscularis propria and local invasion of perivesical fat. Following recovery, clean intermittent catheterization was resumed.

Pathology revealed high-grade angiosarcoma with epithelioid and spindle cells with prominent necrosis: >50%, 10–19 mitoses per 10 high-powered fields with no lymphovascular invasion seen. The epithelioid areas consisted of sheets of large cells with eosinophilic cytoplasm and pleomorphic vesicular nuclei having prominent nucleoli and numerous mitotic figures. Some other areas showed spindle cell carcinoma. (Fig. 3a and b). There were rare foci suggesting angiomatous differentiation. Sarcoma invaded muscularis propria smooth muscle.

The malignant cells showed strong positive staining for vimentin and vascular marker CD31. They were negative for pancytokeratin, CK7, CK20, and GATA-3 (a few scattered cells show weak nuclear staining), desmin, actin, myogenin, S100, Sox-10, CD3, CD45, and CD20 (Fig. 3c).

After multidisciplinary discussion, patient pursued hospice care. He was admitted one month later with pulmonary embolism and was kept on anticoagulation. Two months postoperatively he was readmitted for

* Corresponding author. Department of Urology, The University of Toledo College of Medicine and Life Sciences, 3000 Arlington Ave., Mail Stop 1091, Toledo, OH, 43614-2598, USA.
E-mail address: Firas.petros@utoledo.edu (F.G. Petros).

https://doi.org/10.1016/j.eucr.2023.102593
Received 29 September 2023; Accepted 16 October 2023
Available online 17 October 2023

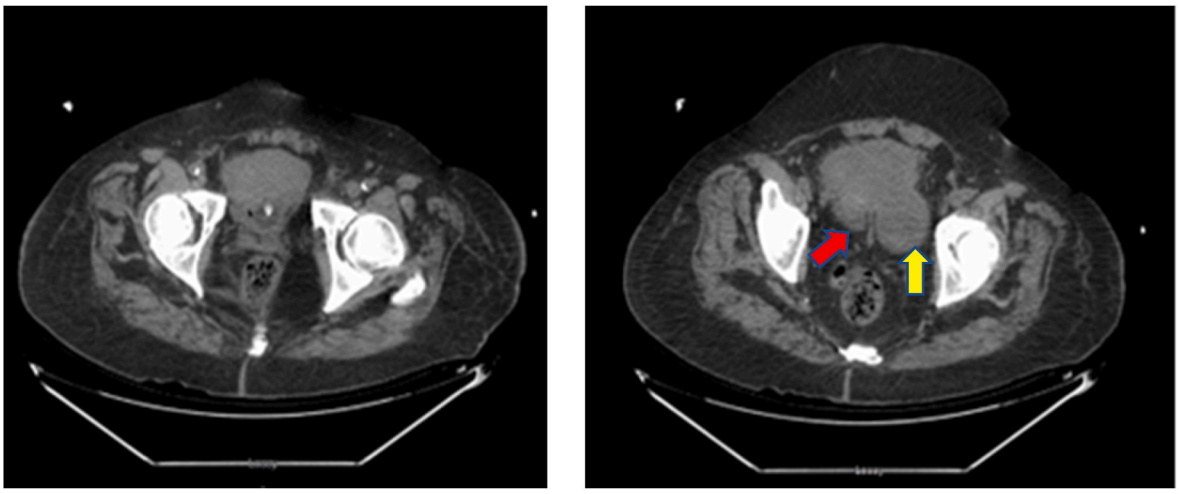

Fig. 1. CT scan of abdomen and pelvis without IV contrast-axial images demonstrates lobulated soft tissue mass along the right bladder margin (red arrow) and large bladder diverticulum spanning up to approximately 10 cm arising from left posterolateral bladder wall (yellow arrow). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

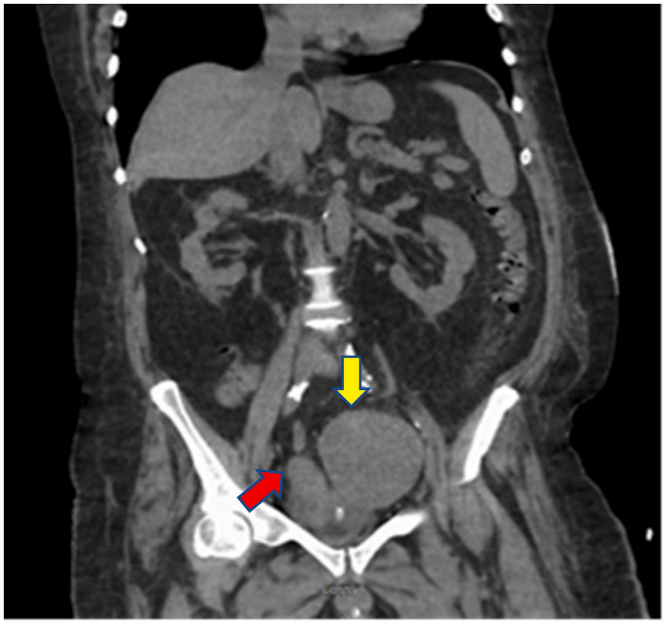

Fig. 2. CT scan of abdomen and pelvis without IV contrast, coronal image-demonstrates lobulated soft tissue mass along the right bladder margin, large left posterolateral bladder diverticulum, and atrophic renal parenchyma consistent with CKD stage III.

gross hematuria with obstruction and was permanently diverted with bilateral percutaneous nephrostomy tubes. Currently, he remains on hospice without further treatment or hospital admissions.

3. Discussion

Angiosarcoma is a rare and aggressive tumor, with rates of advanced or metastatic disease at presentation from 16 to 44%, and overall survival of 6–16 months.[3] Bladder angiosarcoma presents most commonly in men, at median age of 64 years.[2]

Angiosarcoma is distinguished by vascular-specific receptor tyrosine kinase upregulation, including TIE1, KDR, TEK, and FLT1.[3] While there were some studies correlating changes on chromosome 5q35, 8q24 and CIC gene and chromosome 19q13.1, most genetic mutations relating to angiosarcoma, especially bladder, are not well defined.[3]

Risk factors include chronic lymphedema, radiation, smoking, environmental carcinogens, and several genetic syndromes.[3] This patient does not have a known history of radiotherapy or exposure to chemical agents but has a former 20 pack year smoking history.

Due to rarity and nonspecific symptoms in soft tissue angiosarcomas, it is difficult to differentiate from other tumors.[3] This is less so with bladder angiosarcomas where gross hematuria is the most common presenting factor. Ultrasound, CT, and MRI are common diagnostic tools however, ultimate diagnosis is by histopathologic examination.

Pathologic features include presence of anastomosing blood-filled spaces of variable shapes and sizes, lined by pleomorphic mitotically active cells. Also, solid areas of spindled and epithelioid cells with destructive growth and cytologic atypia including hyperchromatic and prominent nuclei, with coarse chromatin.[3] Similar pathologic features were seen within our patient. Angiosarcoma is confirmed when at least one endothelial marker including CD31, CD34, ERG, or Factor VIII-related antigen is positive and urothelial markers such as p63 and GATA-3 are negative.[3] In our patient, CD31 was positive, and GATA-3 was negative.

For soft tissue angiosarcomas, radical surgery is often standard treatment. Due to advanced stage at time of diagnosis and rapid progression, patients who undergo surgery may have positive margins. For patients with significant comorbidities or poor performance status, radiation can be an alternative. Limited studies have shown radiation therapy to be effective for inoperable patients with reduced risk of postoperative recurrence, but optimal dosages are unknown. While no strong data compares both surgical interventions alone with radiation, adjuvant radiotherapy following radical surgery has shown in few trials to be an effective combination.[3]

Adjuvant chemotherapy has been used in patients after surgery or radiotherapy including taxanes, doxorubicin, liposome doxorubicin, and ifosfamide.

Very early trials, with nonbladder angiosarcomas, involving immunotherapy with anti-vascular endothelial growth factor, tyrosine kinase inhibitors, and anti-PD-1 antibodies have shown promise; however, efficacy needs to be studied further.

For bladder angiosarcoma, there is no consensus on ideal treatment nor defined guidelines. Various case reports and literature reviews report on treatment ranging between chemotherapy and external beam radiation, transurethral resection, cystectomy and radical pelvectomy with no defined superiority.[3]

One study reports treatment with radical cystectomy and 5 cycles of adjuvant chemotherapy (mesna, doxorubicin, ifosfamide and

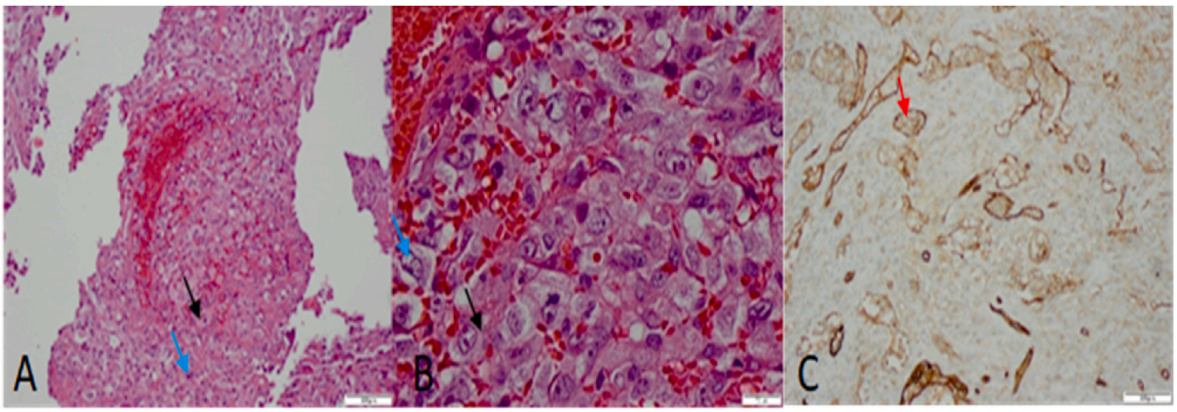

Fig. 3. Pathohistology-Epithelioid areas consisted of sheets of large cells with eosinophilic cytoplasm (black arrow) and pleomorphic vesicular nuclei having prominent nucleoli and numerous mitotic figures (blue arrow) with some other areas showing spindle cell carcinoma. Strong positive staining for vimentin and vascular marker CD31 (red arrow). (a) low power H&E taken at 10x, (b) high power H&E taken at 40x, (c) low power CD31 stain with malignant cells showed positive staining. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

dacarbazine), followed by pelvic and right groin irradiation for an interval enlarged lymph node found 3 weeks later. The patient had a 6-year survival follow up and no evidence of disease on autopsy.[4] Another study reports treatment with cystectomy, chemotherapy (doxorubicin/ifofosfomide) and external beam radiation with no recurrence on 32-month follow-up.[5]

4. Conclusions

This case sheds the light on the diverse manifestations and demographic of bladder angiosarcoma. Histopathologic features and endothelial markers help establish diagnosis. Prognosis remains poor given locally advanced and frequently metastatic disease at presentation with no defined superiority of any treatment approaches.

Consent

No identifiable images, however informed consent was obtained.

Funding

This research is funded by Frank Stranahan Foundation for Oncological Research.

Declaration of competing interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be interpreted as a potential conflict of interest.

Acknowledgments

None.

References

1. Cito G, Santi R, Gemma L, et al. Angiosarcoma of the urinary bladder following radiotherapy: report of a case and review of the literature. *Medicina.* 2021 Apr 1;57 (4):329. https://doi.org/10.3390/medicina57040329.
2. Mondaini N, Palli D, Saieva C, et al. Clinical characteristics and overall survival in genitourinary sarcomas treated with curative intent: a multicenter study. *Eur Urol.* 2005;47:468–473.
3. Cao J, Wang J, He C, et al. Angiosarcoma: a review of diagnosis and current treatment. *Am J Cancer Res.* 2019;9:2303–2313.
4. Pazona JF, Gupta R, Wysock J, et al. Angiosarcoma of bladder: long-term survival after multimodal therapy. *Urology*. 2007;69, 021.
5. Engel JD, Kuzel TM, Moceanu MC, et al. Angiosarcoma of the bladder: a review. *Urology*. 1998;52:778–784.