CASE REPORT

UROLOGICAL ONCOLOGY

Inflammatory myofibroblastic tumor of the urinary bladder: A rare diagnostic challenge

Layla Settaf-Cherif[1], Adam Ostrowski[2], Chidindu Chikwendu[1], Oliwia Kwiatkowska[1], Michał Czarnogórski[2], Paweł Lipowski[2], Kajetan Juszczak[2], Jan Adamowicz[2], Tomasz Drewa[2]

[1]*Student's Scientific Circle by the Department of Urology and Andrology, Ludwik Rydygier Collegium Medicum, Nicolaus Copernicus University, Bydgoszcz, Poland*
[2]*Department of Urology and Andrology, Ludwik Rydygier Collegium Medicum, Nicolaus Copernicus University, Bydgoszcz, Poland*

Layla Settaf-Cherif and Adam Ostrowski contributed equally to this work.

Citation: Settaf-Cherif L, Ostrowski A, Chikwendu C, et al. Inflammatory myofibroblastic tumor of the urinary bladder: A rare diagnostic challenge. Cent European J Urol. 2025; doi: doi: 10.5173/ceju.2025.0195

Article history
Submitted: Aug. 28, 2025
Accepted: Oct. 22, 2025
Published online: Nov. 17, 2025

Corresponding author
Layla Settaf-Cherif
Szpital Uniwersytecki nr 1 im. dr. A. Jurasza
9 M. Curie Skłodowskiej St.,
85-094 Bydgoszcz, Poland
layla1cherif@gmail.com

We present a case of a 44-year-old male with gross hematuria and lower urinary tract symptoms (LUTS). Ultrasonography revealed a 3 cm lesion, initially non-indicative of bladder cancer. Magnetic resonance imaging (MRI) identified a 26 mm posterior bladder wall mass, suggesting muscle invasive bladder cancer (MIBC). Transurethral resection of the bladder tumor (TURBT) was performed. Histopathology and immunohistochemistry confirmed an inflammatory myofibroblastic tumor (IMT). No neuro- or angioinvasion was present. Follow-up clinical evaluation revealed no evidence of recurrence, and the patient remained asymptomatic with complete resolution of urinary symptoms.

Key Words: inflammatory myofibroblastic tumor ‹› urinary bladder ‹› anaplastic lymphoma kinase ‹› transurethral resection ‹› spindle cell neoplasm ‹› hematuria

CASE PRESENTATION

We presents a 44-year-old patient who was admitted to the Urology Department in July 2023 with episodes of gross hematuria and lower urinary tract symptoms (LUTS), including urinary urgency and incontinence. Patient was a non-smoker, had no prior urological history or significant comorbidities, and had no family history of similar illnesses. Notably, he worked as a wood processing technologist with occupational exposure to formaldehyde.

Initial bladder ultrasound revealed a 3 cm lesion. A multiparametric pelvic magnetic resonance imaging (MRI) showed a 26 mm mass on the posterior wall of the bladder, just above the median umbilical ligament, with substantial peripheral contrast enhancement and mild diffusion restriction. The lesion was rated as VI-RADS 4 (Figure 1). There were no signs of local invasion into perivesical tissues, suspicious lymphadenopathy, seminal vesicle abnormalities, or distant metastases. The prostate measured 34 × 48 × 39 mm with imaging features of benign prostatic hyperplasia (BPH).

The patient underwent ransurethral resection of bladder tumor (TURBT). Macroscopically, the tumor was friable and vascular; the resected tissue fragments measured up to 5 cm. The post-resection site appeared macroscopically clear (Figure 2). The patient was discharged in stable condition.

Histopathological specimen examination showed spindle cell proliferation, areas of necrosis, marked mucosal edema, and a dense chronic inflammatory infiltration, rich in plasma cells, with focal lymphoid follicle formation, and scattered eosinophils and neutrophils. There was no evidence of angioinvasion, neuroinvasion. The final diagnosis

of Inflammatory myofibroblastic tumor (IMT) was confirmed after immunohistochemical analysis. Tumor cells stained positively for ALK-1, actin (ASM), CK Pan, CD10, and Cyclin D1. Focal positivity was observed for S100. Negative markers included CD34, CD31, p63, GFAP, CD117, and DOG-1. The Ki67 index showed 98% in lymphoid follicle proliferation centers for inflammatory infiltrate cells and up to 7% outside these centers.

During follow-up, the patient was referred for rheumatological evaluation due to incidental autoimmune screening abnormalities. The autoimmune panel revealed the presence of antinuclear antibodies (ANA) in a speckled pattern at a titer of 1 : 160. All antibody tests were negative, including antineutrophil cytoplasmic antibodies (ANCA), anti-ds-DNA, PR3 (proteinase-3), MPO (myeloperoxidase), and the extended antibody profile. No systemic autoimmune disease was diagnosed, and the findings were considered unrelated to the bladder lesion.

Up to date, the patient has shown no signs of recurrence. He remains asymptomatic, with complete

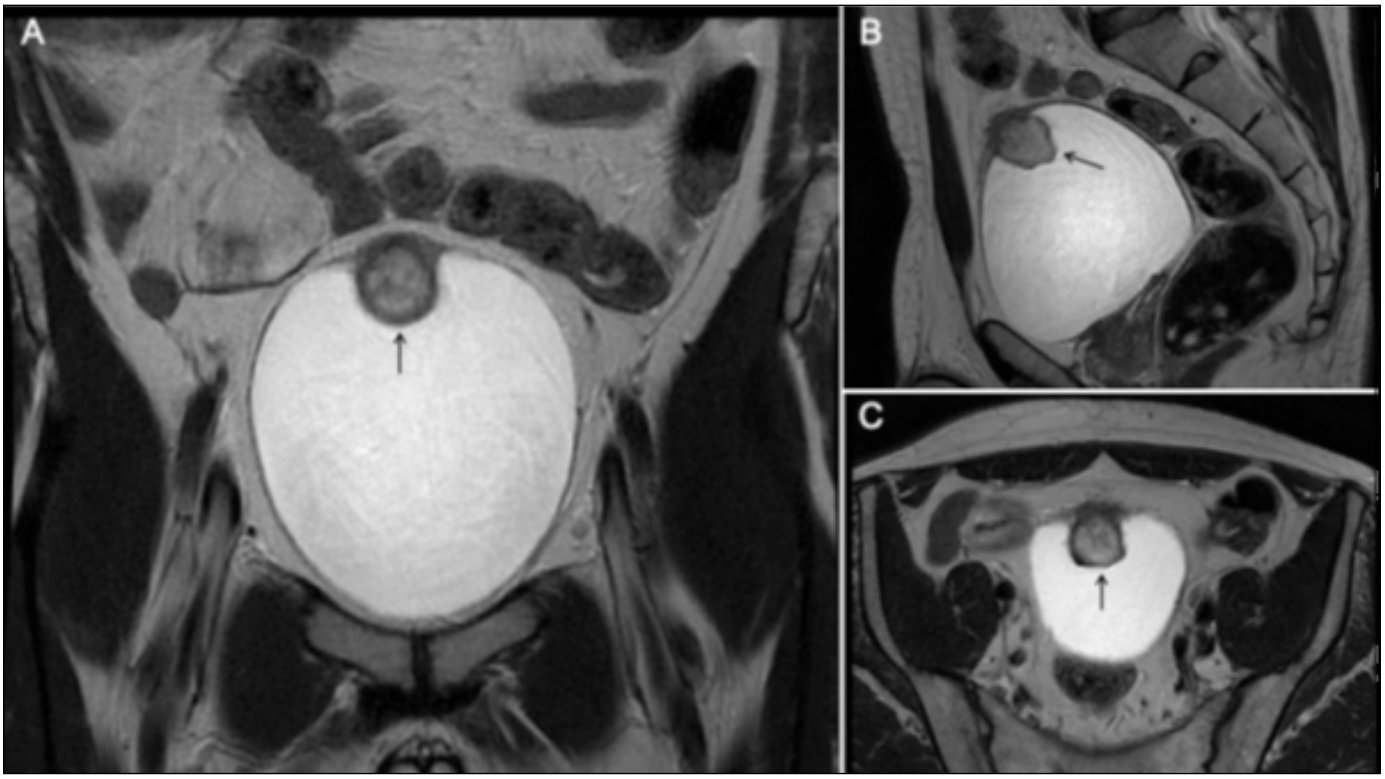

Figure 1. *Multiparametric MRI scan showing a bladder wall lesion (arrows) on T2-weighted images.* **A.** *Coronal,* **B.** *Sagittal, and* **C.** *Axial views with a well-defined mass arising from the posterior bladder wall.*

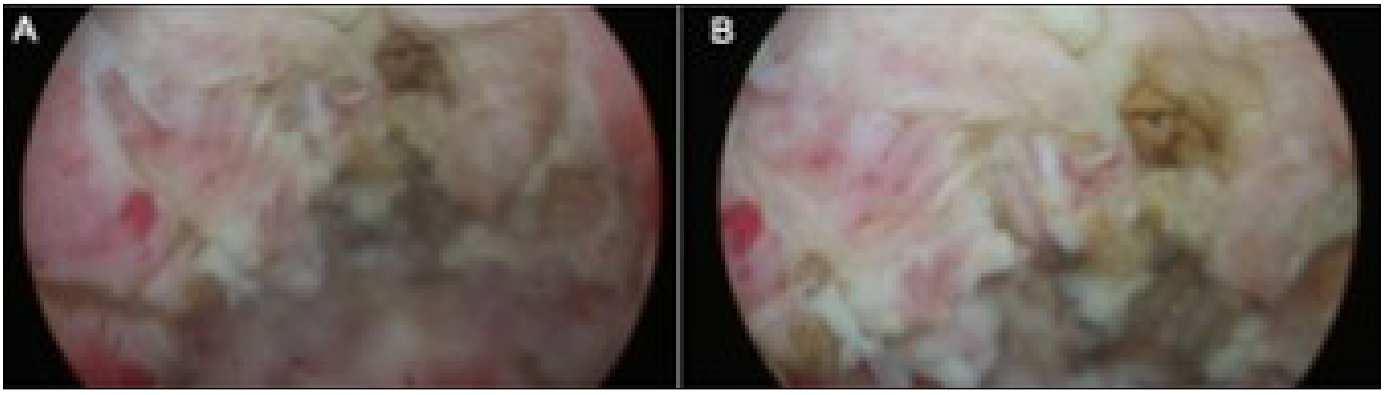

Figure 2 A-B. *Post-TURBT resection bed with no visible residual tumor. The site appears macroscopically clear, with coagulation and tissue discoloration consistent with recent tumor removal.*

resolution of LUTS and no recurrence of hematuria. Clinical assessments and surveillance imaging have revealed no evidence of residual or recurrent disease. A control computed tomography (CT) scan performed in February 2025 revealed only postoperative fibrotic changes, with no suspicious findings. The patient continues under routine urological follow-up, with further imaging and clinical evaluation planned as indicated.

DISCUSSION

IMT of the urinary bladder is a rare benign lesion, classified by the World Health Organization (WHO) as a mesenchymal tumor of borderline malignant potential [1]. While the etiology of bladder IMT remains unclear, some cases have been associated with prior inflammation, surgery, or local irritation [2, 3]. Our patient had occupational exposure to formaldehyde, a known human carcinogen linked to respiratory tract malignancies [4]. However, current literature does not support a direct association between formaldehyde and IMT. In this case, the exposure was noted as part of the clinical history, but its relevance to tumor development remains questionable.

Clinically, patients with IMT typically present with painless macroscopic hematuria and LUTS [5, 6]. Less commonly, pelvic pain or urinary obstruction can occur [6]. On examination and initial ultrasound or cystoscopy, IMT appears as a bladder mass that is indistinguishable from a malignant tumor. Radiologically, there are no definitive features to differentiate IMT from bladder cancer, as it often appears as a large mass arising from the bladder wall [7]. On multiparametric MRI, such lesion would likely be assigned a high VI-RADS score (with probable muscle invasion) due to its size and wall involvement [8]. In our case, the lesion was rated as VI-RADS 4, strongly raising suspicion of malignancy. Consequently, in the differential diagnosis, other spindle-cell lesions of the bladder should be considered, including sarcomatoid carcinoma, leiomyosarcoma, and postoperative spindle cell nodule, as these can closely mimic IMT both radiologically and histologically [9, 10]. Definitive diagnosis of bladder IMT relies on histopathology and immunohistochemistry [11].

Histologically, IMT is characterized by a proliferation of spindle-shaped myofibroblasts set in a myxoid to collagenous stroma with a prominent inflammatory infiltrate, including lymphocytes and plasma cells [11]. Immunohistochemistry significantly adds to the differentiation of IMT from malignant spindle-cell lesions. The spindle cells of IMT invariably express mesenchymal markers such as vimentin and often muscle-specific actins (smooth muscle actin, and less frequently desmin) [12]. Around 50% to 65% of bladder IMTs show positive staining for ALK-1 protein expression [13]. In fact, ALK-1 immunoreactivity is considered a characteristic feature of IMT and is typically absent in most histologic mimics [14], as observed in our case. While ALK-1 positivity is diagnostically valuable, it does not correlate with worse clinical outcomes. Other markers, such as desmin or p53, may show variable expression, but none are as diagnostically valuable as ALK-1 [15]. In ALK-positive cases, molecular tests like FISH or RNA sequencing can confirm ALK gene fusions and further support the diagnosis [8, 16].

A complete surgical excision is the preferred treatment. Due to the rarity of bladder IMT, there are no established guidelines, and management should be individualized [11]. TURBT is often the first-line treatment and can be curative if the lesion is fully resected endoscopically [17]. In a 2014 systematic review of 182 cases, 61% of patients were managed with TURBT alone, achieving tumor control. Partial cystectomy was employed in about 29% of cases, usually for larger tumors or when the pathology was uncertain. Radical cystectomy was performed in roughly 9% of patients in that review, generally in cases initially misdiagnosed as aggressive cancer or where less radical methods failed [11]. Adjuvant therapies have a very limited role. Unlike high-grade bladder cancers, IMTs do not have an established indication for chemotherapy or radiotherapy, as these tumors usually do not metastasize and tend to respond well to surgery [18]. The consensus in the literature is that complete surgical resection is the optimal management, followed by careful observation.

Bladder IMTs generally have an excellent prognosis after treatment. In most cases, they behave as benign neoplasms with only local growth. The largest systematic review (182 patients) documented a local tumor recurrence rate of only about 4%, with metastases being exceedingly rare [11]. The overall survival is excellent given the benign nature. Practically all patients are cured after surgery. In our case, no recurrence has been observed to date, which is reassuring, yet ongoing surveillance remains warranted.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

FUNDING

This research received no external funding.

ETHICS APPROVAL STATEMENT

The patient has given informed consent for the treatment received. There was no need for ethics committee approval. Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

References

1. Gass J, Beaghler M, Kwon M. Inflammatory Myofibroblastic Tumor of the Urinary Bladder: A Case Report. J Endourol Case Rep. 2019; 5: 31-33.
2. Ortiz MV, Rossi CT, Hill DA, Guzzetta PC, Qureshi F, Dome JS. Inflammatory myofibroblastic tumor as a second neoplasm after Wilms tumor. Pediatr Blood Cancer. 2015; 62: 1075-1077.
3. Kumar A, Bhatti SS, Sharma S, Gupta SD, Kumar R. Inflammatory pseudotumor of urinary bladder – a diagnostic and management dilemma. Int Urol Nephrol. 2007; 39: 799-802.
4. Swenberg JA, Moeller BC, Lu K, Rager JE, Fry RC, Starr TB. Formaldehyde Carcinogenicity Research: 30 Years and Counting for Mode of Action, Epidemiology, and Cancer Risk Assessment. Toxicol Pathol. 2013; 41: 181-189.
5. Tegegne CY, Yitayew MA, Alemu CT, Shiferaw SF, Mikru AM, Rabile AO. Inflammatory myofibroblastic tumor of the bladder treated with partial cystectomy: Case report. Int J Surg Case Rep. 2025; 129: 111225.
6. Park SB, Cho K-S, Kim JK, et al. Inflammatory Pseudotumor (Myoblastic Tumor) of the Genitourinary Tract. Am J Roentgenol. 2008; 191: 1255-1262.
7. Prijovic N, Santric V, Babic U, et al. Inflammatory Myofibroblastic Tumour of the Urinary Bladder in a Middle-Aged Man – A Case Report of an Unusual Localization of a Rare Tumour. Medicina (Mex) 2023; 59: 791.
8. Yuan H, Wang Z, Sun J, Chu J, Duan S, Wang M. A rare huge bladder inflammatory myofibroblastic tumor treated by en bloc resection with diode laser: a case report and literature review. Front Oncol. 2024; 14: 1327899.
9. Sosnowski R, Zakościelny A, Demkow T, Szymański M, Ligaj M. Inflammatory pseudotumor in the urinary bladder. Cent Eur J Urol. 2009; 62: 189-191.
10. Mazurczyk Ł, Czarnogórski M, Czernicka A, et al. Urinary incontinence as the first clinical symptom of urinary bladder leiomyosarcoma. Cent European J Urol. 2025; 78: 103-108.
11. Teoh JYC, Chan N-H, Cheung H-Y, Hou SSM, Ng C-F. Inflammatory Myofibroblastic Tumors of the Urinary Bladder: A Systematic Review. Urology. 2014; 84: 503-508.
12. Balagobi B, Gobishangar S, Ginige A, Gamlaksha D, Sanjeyan J, Suvethini L. Inflammatory myofibroblastic tumour: case report of a rare form of bladder tumour. Int J Surg Case Rep 2022; 92: 106786.
13. Medeiros LJ, Elenitoba-Johnson KSJ. Anaplastic Large Cell Lymphoma. Am J Clin Pathol. 2007; 127: 707-722.
14. Machioka K, Kitagawa Y, Izumi K, Kitamura S, Ikeda H, Namiki M. Inflammatory Myofibroblastic Tumor of the Urinary Bladder with Benign Pelvic Lymph Node Enlargement: A Case Report. Case Rep Oncol. 2014; 7: 571-575.
15. Poombal F, Mansoor I, Abdellatif RM, Shaker N. Anaplastic lymphoma kinase1 positive inflammatory myofibroblastic tumor of the urinary bladder: A rare mesenchymal neoplasm with diagnostic and therapeutic implications. SAGE Open Med Case Rep. 2024; 12: 2050313X241308992.
16. Sukov WR, Cheville JC, Carlson AW, et al. Utility of ALK-1 protein expression and ALK rearrangements in distinguishing inflammatory myofibroblastic tumor from malignant spindle cell lesions of the urinary bladder. Mod Pathol. 2007; 20: 592-603.
17. Alam R, Johnson MH, Caldwell T, Pavlovich CP, Bivalacqua TJ, Tosoian JJ. Diagnosing and Treating Inflammatory Myofibroblastic Tumor of the Bladder. Case Rep Urol. 2016; 2016: 1–3.
18. Marais B, Eyal P, Kesner K, John J. Inflammatory myofibroblastic tumour of the bladder: a case report and review of the literature. Ther Adv Urol. 2022; 14: 17562872221096385. ■