Actin' Up: A Bladder-Dome Catfish

Bladder-dome actinomycosis masquerading as locally advanced urachal carcinoma

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Abstract

Introduction: Actinomycosis is a chronic bacterial infection that spreads across tissue planes and forms infiltrative, mass-like lesions, giving it a longstanding reputation as a mimic of malignancy. Pelvic disease arising at the bladder dome or a urachal remnant is rare and is repeatedly mistaken for urachal or bladder adenocarcinoma.

Case: A large, rapidly enlarging bladder-dome and urachal mass with apparent rectus and sigmoid invasion, planned for partial cystectomy after tumor board review, proved to be pelvic actinomycosis. Anaerobic culture of a percutaneously drained collection grew *Actinomyces odontolyticus* after transurethral biopsy returned only chronic inflammation.

Conclusions: An infiltrative bladder-dome or urachal mass, in rare cases, is not cancer. Roughly ten percent of pelvic actinomycosis is identified before resection. When a fluid collection is present, drain it, Gram stain it, and culture it before resecting.

Introduction

Actinomycosis spreads across tissue planes and forms infiltrative, granulomatous, mass-like lesions, a growth pattern that has long earned it a reputation as a mimic of malignancy. Pelvic disease arising at the bladder dome or a urachal remnant is rare, with roughly 23 cases reported, and is repeatedly mistaken for urachal or bladder adenocarcinoma.[1] We present a case in which a large, rapidly enlarging bladder-dome and urachal mass with apparent rectus and sigmoid invasion proved to be actinomycosis, sparing the patient radical surgery.

Case presentation

A 63-year-old man with diabetes and liver fibrosis was evaluated in primary care over four months for urinary frequency, nocturia, and suprapubic pain, together with roughly 25 kg of weight loss. The symptoms were attributed first to constipation and then to benign prostatic hyperplasia and treated with tamsulosin, without improvement. A urine culture sent during this workup showed no growth.

A renal and bladder ultrasound obtained in the spring already showed irregular mass-like wall thickening of the bladder dome (Figure 2), but the study was not finalized by radiology for a month and the finding went unacted upon. At an urgent care visit for persistent symptoms, computed tomography showed a large heterogeneous, infiltrative mass arising from the superior bladder and extending along the urachus to the umbilicus, with a bladder component of 6.6 by 7.4 cm. The mass involved both rectus abdominis muscles, effaced the fat planes against the sigmoid colon with wall thickening suspicious for invasion, and produced periumbilical induration.

The mass was strikingly fast-growing. Eighteen days after the ultrasound had shown only wall thickening, the CT showed the 6.6 by 7.4 cm mass; a repeat CT eleven days after the first showed further interval growth with a new multiloculated fluid collection (Figure 1).

The radiologic differential was led by bladder or urachal malignancy, with urachal adenocarcinoma favored, and he was admitted for presumed locally advanced disease. He was discussed at tumor board, and the plan was partial cystectomy, with transurethral resection first to obtain a tissue diagnosis. When pus began extruding from the umbilicus, interventional radiology placed a percutaneous drain on the multiloculated collection but obtained no tissue, so transurethral resection and biopsy of the bladder-dome mass proceeded for diagnosis.

The catch

Gram stain of the drained aspirate showed purulent fluid with mixed organisms (Gram-positive cocci in pairs and chains, occasional Gram-negative rods) rather than tumor cells, the first hard evidence that the mass was an infection. Biopsy of the bladder-dome mass was negative for malignancy, showing only polypoid bladder tissue with chronic inflammation, edema, and benign metaplastic glandular epithelium, a diagnosis confirmed by several pathologists. Anaerobic culture of the drained sterile-site collection grew *Actinomyces odontolyticus*, with

urine growing *Parvimonas micra* and *Bacteroides fragilis* and negative blood cultures. The picture was consistent with pelvic actinomycosis producing an infiltrative, abscess-forming pseudotumor.

Management and outcome

He was treated with source control and antibiotics rather than oncologic surgery, receiving intravenous ceftriaxone for six weeks and oral metronidazole for four weeks, chosen over penicillin monotherapy given the polymicrobial, *Bacteroides*-containing culture, followed by a prolonged oral course with infectious disease follow-up. The leukocytosis resolved, the umbilical drainage stopped, the mass regressed on examination to a quarter of its size within a week, and serial CT showed the rectus collection shrinking. He was discharged home with his bladder intact.

Discussion

Managed as the suspected urachal adenocarcinoma, this patient faced partial or radical cystectomy with en bloc resection of involved rectus and bowel. Reported urachal and bladder actinomycosis is rare, with roughly 23 cases in the literature. A 2025 systematic review pooled 17 cases, in which abdominal pain (13 of 17) and a palpable mass (7 of 17) predominated; most patients underwent surgery, commonly partial cystectomy, with antibiotics, and a strictly medical approach also succeeded, with no reported recurrences.[1] Most cases are caused by *Actinomyces israelii* and diagnosed histologically by sulfur granules.

The present case is unusual on three counts: the species (*Actinomyces odontolyticus*), a culture-based diagnosis with bland histology, and bladder preservation with drainage and antibiotics alone. Three things made the catch. First, the fluid collection invited aspiration, and its Gram stain showed pus and bacteria, which immediately reframed the mass as an infection. Second, it was the sterile-site culture, not the mass biopsy, that yielded the organism. Third, the biopsy honestly returned benign inflammation rather than a forced malignant interpretation.

Conclusions

An infiltrative, fast-growing bladder-dome and urachal mass is not always cancer. Actinomycosis belongs on the differential for any infiltrative bladder-dome or urachal mass, particularly one that is rapidly enlarging or harbors an abscess or umbilical drainage. When a fluid collection is present, drain it, Gram stain it, and culture it before you resect it. Doing so made the diagnosis and saved the bladder.

Figures

Figure 1. Interval growth. (A) Index CT: infiltrative mass at the bladder dome extending along the urachus to the umbilicus with rectus involvement. (B) CT eleven days later at admission: interval enlargement with a new multiloculated fluid collection — the rapid growth that read as aggressive malignancy.

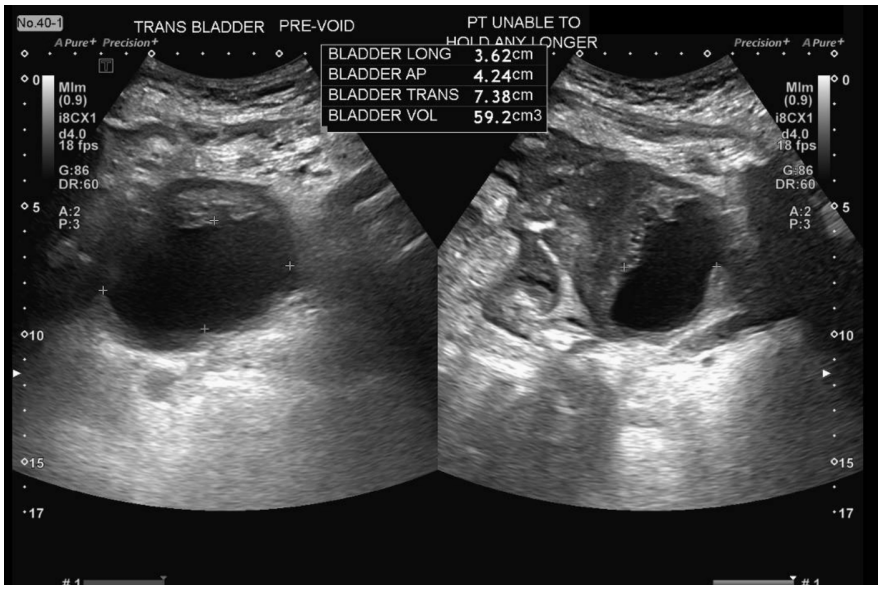

Figure 2. The unread clue. Bladder ultrasound: irregular mass-like wall thickening of the dome, acquired roughly 18 days before the CT but unread for a month.

References

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