Case Report

Unusual Computed Tomographic features of Bladder Cancer with Giant bladder stone and pulmonary metastasis: A case report

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ABSTRACT

Bladder cancer is the most common urothelial malignancy and is frequently linked to chronic bladder irritation from calculi and recurrent infections. Although associations between bladder stones and malignancy have been described, the coexistence of bladder cancer, large bladder, and renal calculi with lung metastasis is extremely rare. A 58-year-old man presented to the emergency department with acute urinary retention. Laboratory findings demonstrated markedly elevated serum urea and creatinine. Kidney–ureter–bladder (KUB) radiograph revealed a giant vesical calculus measuring 10 × 8 cm. Computed Tomography (CT) urography confirmed multiple bilateral renal calculi and a large bladder stone, along with diffuse anterior and lateral bladder wall thickening and a polypoid mass on the right lateral wall extending into the bladder lumen, nearly obliterating it, with paravesical extension. CT chest revealed multiple "cannonball" pulmonary metastases. The patient underwent open cystolithotomy with bladder biopsy, which confirmed an undifferentiated bladder carcinoma. This case demonstrates an unusual presentation of bladder cancer with concurrent large bladder and renal stones and distant pulmonary metastases. The coexistence of these findings has not, to our knowledge, been previously reported in English literature. Chronic irritation from calculi and infection likely contributed to malignant transformation. Bladder cancer should be considered in patients with long-standing urinary symptoms, recurrent urinary tract infections, or hematuria in the presence of bladder calculi. Computed Tomography is highly sensitive for detecting urinary tract calculi. Early diagnosis is crucial to guide timely intervention and improve outcomes.

Keywords: Bladder cancer, Bladder stone, Computed tomography, Cystolithotomy, Pulmonary metastasis

INTRODUCTION

Bladder carcinoma is the commonest urinary tract malignancy.[1] It has a higher prevalence in males than females with risk factors including bladder stone, smoking and chronic urinary infection.Patients with bladder cancer usually present with painless hematuria. The diagnosis is often delayed, as the symptoms are similar to various other benign conditions such as urinary tract infection, prostatitis or renal calculi. Bladder calculi account for 5% of urinary calculi and usually occur because of bladder outlet obstruction,urinary stasis, neurogenic voiding dysfunction, urinary tract infection, or foreign bodies.[1,2]

Bladder cancer is categorized into several types based on histological characteristics, with urothelial carcinoma (also known as transitional cell carcinoma) being the most common, accounting for

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approximately 90% of cases. Other types include squamous cell carcinoma, adenocarcinoma, and small cell carcinoma.[3] Undifferentiated bladder carcinoma is a rare and aggressive epithelial malignancy that lacks distinct histological features, making it difficult to categorize. According to the World Health Organization's classification, it falls under poorly differentiated carcinomas.[4] This type accounts for only 0.6-0.9% of bladder cancer cases and is associated with a poor prognosis.[5]

Advanced bladder cancer can cause various symptoms, including pelvic or bone pain, swelling in the lower extremities due to vessel compression, and flank pain from ureteral obstruction. In some cases, metastasis may be the first sign of disease, often affecting the lungs.[6]

CT scans are highly effective in detecting urinary tract stones, precisely locating them and determining their size. CT scans are valuable for cancer staging and prognostication, while MRI is considered the gold standard for imaging bladder tumors due to its high soft-tissue resolution. Both CT and MRI are often used complimentarily, with CT being particularly useful for assessing large tumors, lymph node involvement, and distant metastases.

We hereby report a case of a 58-year-old man with a complex presentation of bilateral renal stones, a large bladder stone, a bladder tumor, and metastatic disease to the lungs.

CASE PRESENTATION

A 58-year-old male presented to our hospital with more >3 year history of progressive suprapubic swelling with frequency, urgency and feeling of incomplete emptying. There was associated weight loss; these symptoms had worsened and

macrohematuria had developed within the past 3 days. The patient was a farmer, with no history of any injury, and no other lower urinary tract symptoms such as dysuria, interruption of urinary stream, and urinary retention and incontinence, except frequency and urgency, and no complaints of abdominal pain. His suprapubic area

was hard on palpation. An ultrasound scan showed multiple bilateral renal stones with right sided hydronephrosis. A huge mass casting posterior acoustic shadowing was seen arising from the pelvis. Kidney–ureter–bladder (KUB) radiograph revealed a giant lamellated bladder calculus measuring 10 × 8 cm.(Fig 1)

Computed tomography (CT) urography confirmed multiple bilateral renal calculi with the largest in the right lower pole, measuring 14.3mm and a large bladder stone measuring 9.36x7.87 x9.90(APxTxCC).(Fig 2)

An infiltrative poorly-enhacing, diffuse thickening of the bladder was seen predominantly at its anterior and lateral bladder walls with an exophytic mass on the right lateral wall seen extending into the bladder lumen and nearly obliterating it.(Fig 3) There was obliteration of the paravesical fat stripe with distortion of the adjacent organs. Some obturator lymphadeopathy was seen.

Imaged portion of the chest revealed multiple "cannonball" pulmonary metastases(Fig 4). No bony or liver metastasis was seen. Tumor was staged as T4N1M1

His renal function test showed elevated urea and creatinine.

He had open cystolithotomy surgery with bladder tumor biopsy. (Fig 5)

The postoperative period was uneventful and was discharged home on POD 3. He was lost to follow up. The specimens were sent for histological investigation with resulting final diagnosis of undifferentiated bladder cancer

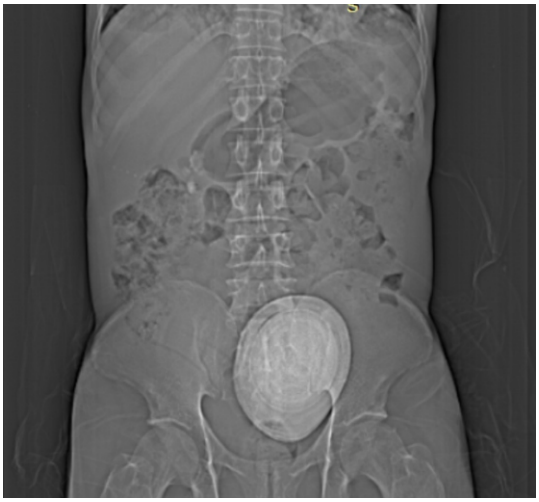

Fig 1: Plain abdominal radiograph showing huge bladder stone

Fig 2: Abdominal CT showing bilateral renal stones

Fig 3 Abdominopelvic CT showing an infiltrative bladder mass with coexisting bladder stone

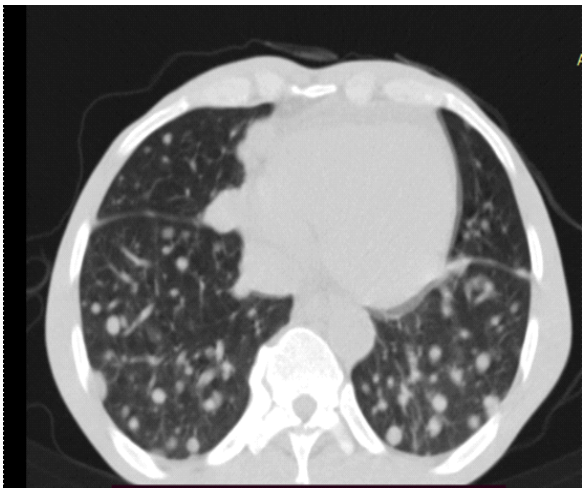

Fig 4 showing a multiple canon ball metastasis in the chest

Fig 5 showing the bladder stone

DISCUSSION

Carcinoma is common in areas where schistosomiasis is endemic and is usually associated with bladder stone, stasis, chronic bladder outlet obstruction and recurrent urinary tract infection.[7,8] In this index case, histopathology showed a poorly differentiated bladder carcinoma which is a rare and aggressive epithelial malignancy that lacks distinct histological features.[4] Undifferentiated bladder cancer tends to be refractory to treatment, and complete regression after multidisciplinary therapy is rare.[9]

Tobacco smoking is a major risk factor for bladder cancer, increasing the risk by 2.5 times compared to non-smokers. Environmental and occupational exposures, as well as genetic predisposition, also contribute to the development of bladder cancer. Bladder stone formation, often caused by urinary stasis, is another significant risk factor. Chronic bladder irritation from conditions like UTIs, persistent catheters, and certain medications can also play a role. These factors have been linked to an increased risk of bladder cancer in various studies.[10-12]

The patient in this index case had bilateral renal stones and bladder stones. He complained of chronic urinary obstructive symptoms and because he lived in the rural community with no access to good hospital, he neglected his symptoms until they were unbearable. Bladder cancer often spreads to the lungs, with up to 50% of patients with muscle-invasive bladder cancer developing occult metastases within 5 years of diagnosis. The cancer typically spreads through regional lymphatics.

Pulmonary metastases can manifest in various ways, including nodules, masses, or micronodules. In some cases (around 4%), lung metastases can evolve into cavitary lesions.[13]

While dedicated chest CT was not done for this patient initially, imaged portion of the chest showed multiple canon ball metastasis. In managing patient with bladder stones and bladder carcinoma, the role of imaging cannot be overemphasized. MR is imaging modality of choice in local staging of urinary bladder carcinoma due to its Sensitivity and positive predictive value > 90% and overall diagnostic accuracy of 62-75%

It has inherent high soft tissue contrast with multiplanar capabilities and non-nephrotoxic contrast It is superior to CT in assessing depth of muscular invasion. CT is invaluable to evaluate for distant metastasis especially to the lungs and to assess the upper urinary tract for stones.

CONCLUSION

We present a case of undifferentiated carcinoma of the bladder in a patient with a large bladder stone, multiple renal stones with lung metastasis. The patient presented with advanced disease with mortality within few months. Bladder cancer should be considered in patients with long-standing urinary symptoms, recurrent urinary tract infections, or hematuria, especially in the presence of bladder calculi. Computed Tomography is highly sensitive for detecting urinary tract calculi. Early diagnosis is crucial to guide timely intervention and improve outcomes

Recommendations

Given the link between chronic bladder irritation and bladder cancer, we recommend early medical evaluation for patients with recurrent urinary tract symptoms. Public awareness campaigns should emphasize the importance of seeking prompt medical attention and avoiding self-medication or reliance on herbal remedies.

This aims to promote early detection and intervention for better patient outcomes.

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