

Mucormycosis in the urinary bladder, the devil is in the details: a rare case report

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Abstract

Mucormycosis is a fungal infection involving rhinocerebral, pulmonary, cutaneous, gastrointestinal, disseminated forms with high morbidity and mortality with rare involvement of urinary bladder. Diagnosis is made by examining under a microscope, identifying broad, nonseptate, irregular, ribbon-shaped hyphae. Timely diagnosis and starting antifungal drugs are key for successful treatment.

Introduction

Mucormycosis in the urinary bladder is extremely rare with only one case reported in the literature. [1]

Mucormycosis of the urinary bladder is usually associated with renal mucormycosis. Risk factors for mucormycosis are diabetes mellitus, chronic kidney disease, malignancies, immunosuppressive therapy, and recently Covid 19 infection, etc. [2]

It is caused by fungi of order Mucorales which includes several species. It causes infection in immunocompromised patients however occasionally in immunocompetent patients. [3]

We present a case of 55 years diabetic patient with fever, difficulty in urination and deranged creatinine ultimately diagnosed with urinary bladder mucormycosis.

Case summary A 55 years male presented with low-grade fever, dysuria, flank pain and obstructive urinary symptoms. He was a known diabetic on oral hypoglycaemic drugs. He has no history of dyspnoea, chest pain, facial pain, recent Covid 19 infection, or intake of any immunosuppressive therapy. On clinical examination abdomen was normal, the renal angle was nontender. Blood investigation were Hemoglobin 12.5, TLC 11500/mm³, Urea 35, creatinine 2.5 mg/dl, electrolytes were normal. Ultrasound and Noncontrast CT scan abdomen was suggestive of right mild hydronephrosis with thickened urinary bladder filled with internal echoes. Figure 1. Cystoscopy was planned because of hydronephrosis and echogenic contents in the urinary bladder which revealed whitish to yellowish necrotic material in the urinary bladder. Figure 2 Evacuation of necrotic material was done and sent for histopathology. The histopathologic examination of the necrotic material was suggestive of Mucormycosis and aspergillosis. Figure 3. He was started on Posaconazole and improved.

Discussion

Mucormycosis is an infection due to fungi (order Mucorales) of species *Rhizopus*, *Mucor*, *Cunninghamella*, *Apophysomyces*, *Lichtheimia*, *Rhizomucor*. [4]

These are angioinvasive fungi, which invades kidneys hematogenously as part of multi-organ disease, although isolated renal involvement is also reported. [1, 3]

Mucor is an ubiquitous fungi which reaches the human body through spores entrapped in nasal turbinates or through ingestion, inhalation or interrupted skin. This infection is seen commonly in diabetics, immunocompromised patients such as allograft recipients, HIV patients, patients with malignancy and intravenous (IV) drug abusers. [1,5]

The virulence factor involved in the pathogenesis of Mucorales are high-affinity iron permease (FTR1), Spore coat protein (Cot H) and ADP-ribosylation factor which allows fungi to tolerate a low iron environment, impairing host defences and growth of Mucorales. [6]

Neutrophils are the mainstay to mount a response against mucor, hence patients with neutropenia or dysfunction in neutrophils (steroid use, diabetes Mellitus) results in fulminant fungal infection. [7]

On basis of location, mucormycosis can be divided into rhinocerebral, pulmonary, cutaneous, gastrointestinal, disseminated, and uncommon presentations. [8]

Suspecting and timely diagnosis is required for successful treatment of mucormycosis.

In genitourinary organs, mucormycosis is reported in kidneys, although involvement of other organs reported occasionally. It can present with flank pain, fever, acute kidney injury, lump. Diagnosis is by clinical suspicion, radiology, smear examination, culture, and histopathological examination. When culture is not available or could not be done, histopathology is the mainstay of diagnosis. [9]

Examination with stains hematoxylin and eosin (H&E) or Grocott methenamine-silver (GMS) or periodic acid-Schiff (PAS) stains show typical broad, nonseptate, irregular, ribbon-shaped (typically 6- to 25- μ m diameter), irregular branching at 45-90°. Histopathology from tissue shows necrosis and angioinvasion with neutrophils as predominant inflammatory response. A granulomatous response may be seen in delayed stages. [10]

Treatment can be medical as well as surgical as per the condition of the patient. Amphotericin B (liposomal) is first-line treatment with Posaconazole, isavuconazole as alternatives.

Espejo et al reported a case of bladder mass detected and managed medically. They described the presence of fungal mass in a patient with DM and CKD (chronic kidney disease). [1]

In a case series by Devana et al, 15 patients of isolated renal mucormycosis were described. Ten underwent unilaterally nephrectomy and 2 underwent bilateral nephrectomy whereas 2 were managed medically for mucormycosis. [2]

In our patient patient complained of low-grade fever. Investigations suggested right mild hydronephrosis with no renal changes of mucormycosis with echogenic contents in urinary bladder. Patient was taken up for cystoscopy and stenting. On cystoscopy elongated creamy yellow material was seen in urinary bladder. Histopathology suggested mucormycosis in urinary bladder. He was started on oral Posaconazole and improved considerably. Follow up investigation revealed normal kidneys and normal creatinine (1.1mg/dl).

Conclusions

Isolated urinary bladder mucormycosis in healthy immunocompetent hosts is extremely rare. Prompt diagnosis based on the characteristic clinical and radiological picture and starting high-dose antifungal therapy at least 24 hours before surgical debridement offers the best chance of survival in these patients.

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Individual patient Consent taken, can be provided on demand

Authors confirm during that patient consent has been taken and signed and collected in accordance with the journal's patient consent policy.

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Authors contributions

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Author 1 Contributed to conception and design, or acquisition of data, or analysis and interpretation of data; an been involved in drafting the manuscript.

Author 2 Contributed in acquisition of data

Author 3 Analysis and interpretation of data

Author 4 Drafting manuscript

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