

## Case Report

# Incidental isolated renal mucormycosis in immunocompetent patient: a rare and atypical presentation

Deepak Ghuliani<sup>1</sup>, Rajshekar Puttaswamy<sup>1\*</sup>, Kartik Sahni<sup>1</sup>, Reena Tomar<sup>2</sup>

<sup>1</sup>Department of General Surgery, <sup>2</sup>Department of Pathology, Maulana Azad Medical College, New Delhi, India

**Received:** 29 December 2019

**Revised:** 08 February 2020

**Accepted:** 10 February 2020

### \*Correspondence:

Dr. Rajshekar Puttaswamy,

E-mail: [rajshekarbmc7@gmail.com](mailto:rajshekarbmc7@gmail.com)

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

## ABSTRACT

Mucormycosis is a group of clinical syndromes resulting from infection by one of a group of related filamentous fungi. It is an opportunistic fungal infection that rarely occurs in immunocompetent individual. Isolated involvement of any organ is rare and only a few cases of renal mucormycosis have been reported. We present a case report of atypical presentation of a case of renal mucormycosis in a healthy adult with no predisposing factors. A 48 year non diabetic immunocompetent patient underwent right nephrectomy for painful non-functioning kidney. Biopsy showed chronic pyelonephritis with broad non-septate hyphae suggestive of mucormycosis. Post op followup of patient is normal. Mucormycosis of kidney causes extensive infarction and necrosis due to direct angioinvasion and vascular thrombosis leading to fulminant acute renal failure. The disease mimics pyogenic infection leading to delay in diagnosis and hence resulting in high mortality. High index of suspicion is needed for early diagnosis. Urine and blood cultures are usually sterile. Characteristic CT findings include diffuse enlargement of the kidney with absence of contrast excretion and multiple low-density areas in the renal parenchyma representing fungal abscess. Whenever suspected, FNAC or biopsy is strongly advocated as no imaging can confirm the diagnosis. Nephrectomy or debridement of necrotic tissue along with IV Amphotericin B consist the principal treatment. Renal mucormycosis presenting an indolent course and found incidentally after nephrectomy is extremely rare. In an incidentally found mucormycosis, the role of further investigations to find the source and the role of antifungals have to be further studied.

**Keywords:** Isolated renal mucormycosis, Immunocompetent, Non-functioning kidney

## INTRODUCTION

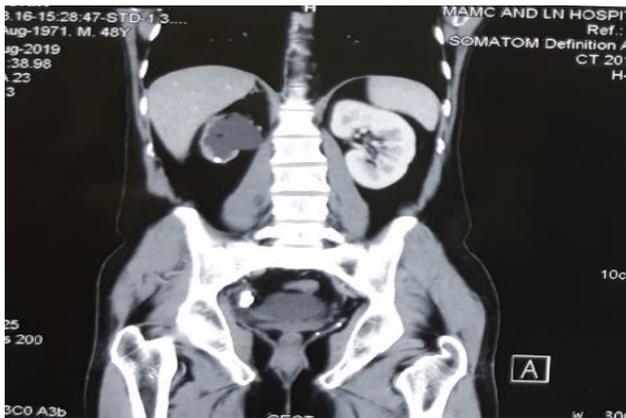
Mucormycosis is a group of clinical syndromes resulting from infection by one of a group of related filamentous fungi from the order *Mucorales* in the subphylum Mucormycotina with *Rhizopus* and *Mucor* being most commonly reported.<sup>1</sup> It is an opportunistic fungal infection that rarely occurs in immunocompetent individuals.<sup>2</sup> Isolated involvement of any organ is rare and only a few cases of renal mucormycosis have been reported.<sup>3</sup> We present a case report of atypical presentation of a case of renal mucormycosis in a healthy

adult with no predisposing factors.

## CASE REPORT

A 48 years old normotensive, non-diabetic male presented to OPD with complaints of pain right flank for 3 months. Pain was sudden in onset, severe intensity, colicky in nature, radiating from loin to groin, partially relieved with medications, associated with burning micturition. Pain was not associated with fever, hematuria, vomiting, loss of appetite, weight loss or poor urinary stream. General physical and systemic

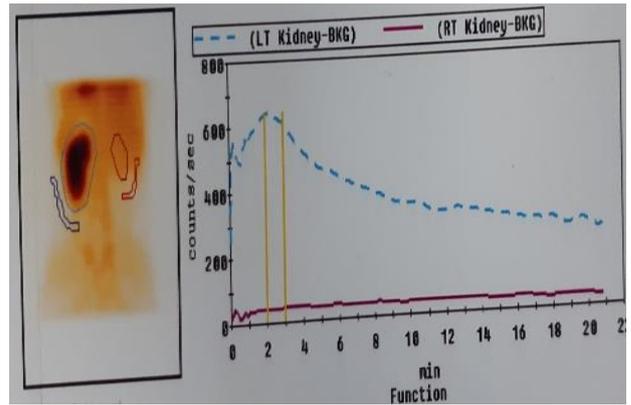
examination did not reveal any abnormality. On evaluation, patient was found to have Hb of 12.8, total leukocyte count of 6600 cells/mm<sup>3</sup> with blood urea levels of 36 mg/dL and serum creatinine of 0.6 mg/dL. His random blood sugar was normal and tri-dot test for HIV was negative. Urine routine examination and culture were unremarkable. Plain X ray KUB revealed right ureteric calculus while on USG KUB right small contracted kidney with moderate hydronephrosis was found. CT urography showed a large right lower ureteric calculus near VUJ with resultant gross hydronephrosis, another small calculus seen in lower pole of right kidney with non-excreting small right kidney. Tc 99m labeled DTPA scan revealed severely impaired renal parenchymal function of right kidney with a differential function of 6%. Patient underwent right simple nephrectomy in view of painful nonfunctional kidney and post-operative period was uneventful. Biopsy of the specimen showed features of chronic pyelonephritis with presence of broad non-septate fungal hyphae, stain for fungus positive, features consistent with mucormycosis with no invasion. Patient did not show any signs of sepsis pre or post operatively and hence was not treated with any antifungals.



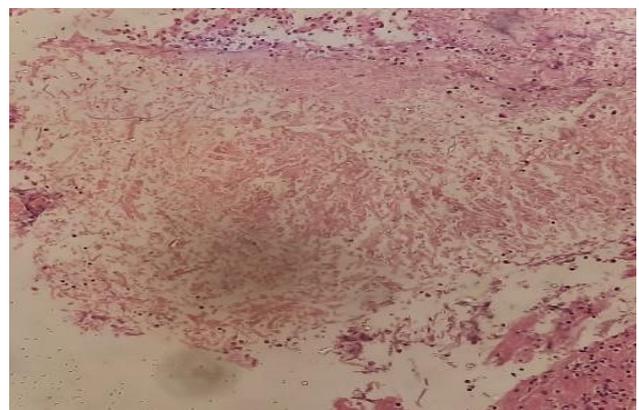
**Figure 1: Coronal CT image showing right lower ureteric calculi and right hydronephrosis.**



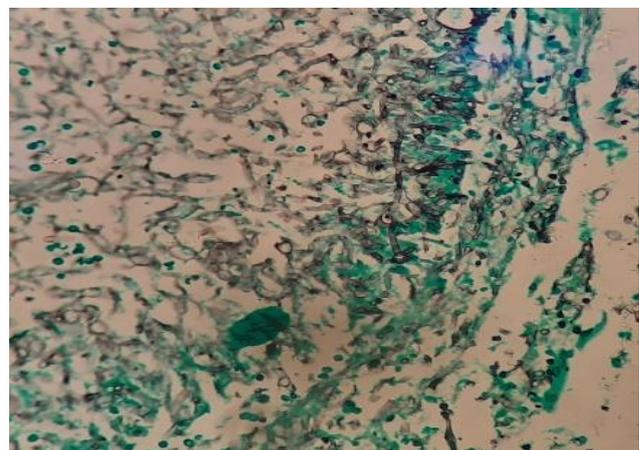
**Figure 2: Axial CT image showing right hydronephrosis and thinned out parenchyma.**



**Figure 3: DTPA scan showing non-functional right kidney.**



**Figure 4: H and E staining of right kidney showing non-septate fungal hyphae.**



**Figure 5: Silver methamine staining of the right kidney showing non-septate fungal hyphae.**

## DISCUSSION

Mucormycosis is a life-threatening fungal infection caused by Mucorales that has emerged as increasingly important pathogen causing invasive infections. It is typically an opportunistic infection seen most often in patients with hematological malignancies, immune-compromised state, transplant recipients, AIDS, diabetes

mellitus and those on prolonged glucocorticoid treatment.<sup>4-5</sup> Unlike other filamentous fungi, which largely infect the patients who lack any immunity, mucormycosis can frequently cause life threatening infections even in patients with relatively preserved immunity like diabetics, IV drug abusers and also in normal immunocompetent patients.<sup>6,7</sup> Diabetes is the most common associated underlying disease.<sup>6-8</sup> Males are more commonly affected and the incidence increases as one crosses 3<sup>rd</sup> decade of life while pediatric cases are also reported.<sup>6-8</sup> Our patient was healthy male without any predisposing factors.

Mucormycosis most commonly present as rhino-cerebral, pulmonary, cutaneous or as disseminated disease. Although renal involvement may be seen in 20% of disseminated cases, isolated renal involvement in immunocompetent patient without any underlying diseases is extremely rare. The pathogenesis of renal involvement is not clearly understood.<sup>9</sup> Retrograde ascending infection from lower urinary tract and hematogenous spread from subclinical pulmonary infection are the proposed routes.<sup>10</sup> It causes extensive infarction and necrosis due to direct angioinvasion and vascular thrombosis leading to fulminant acute renal failure. Renal mucormycosis can be unilateral or bilateral. It usually presents as flank pain, fever, pyuria or hematuria. Concomitant bacterial infection may be present. The disease mimics pyogenic infection leading to delay in diagnosis and hence resulting in high mortality. High index of suspicion is needed for early diagnosis. Our patient had none of the above-mentioned feature except for the flank pain. Urine and blood cultures are usually sterile as seen in our case also. Characteristic CT findings include diffuse enlargement of the kidney with absence of contrast excretion and multiple low-density areas in the renal parenchyma representing fungal abscess.<sup>11</sup> We had no preoperative CT findings suspicious of renal mucormycosis in our case. Whenever suspected, FNAC or biopsy is strongly advocated as no imaging can confirm the diagnosis.<sup>8-11</sup> The pathological hallmark of mucormycosis is extensive angio-invasion. The presence of irregularly shaped, broad non-septate and right-angle branching hyphae is enough to establish the diagnosis. Fungal culture from the tissue is rarely positive. Nephrectomy/debridement of necrotic tissue along with IV Amphotericin B consist the principal treatment. The prognosis remain formidable and the mortality is high (>40%).<sup>8</sup> Renal mucormycosis presenting an indolent course and found incidentally after nephrectomy as seen in our case is extremely rare.<sup>12,13</sup> Whether obstructive uropathy that is seen in our case predisposes to fungal infection of the kidney in a similar way it predisposes to bacterial infection is not clear. In an incidentally found mucormycosis, the role of further investigations to find the source and the role of antifungals have to be further studied.

## CONCLUSION

Isolated renal mucormycosis in immunocompetent patient with benign presentation is extremely rare and unmet needs of standard treatment protocol in such cases remain to be addressed.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

## REFERENCES

- Hibbett DS, Binder M, Bischoff JF, Blackwell M, Cannon PF, Eriksson OE, et al. A higher-level phylogenetic classification of the Fungi. *Mycol Res*. 2007;111(5):509-47.
- Prasad BS, Shenoy A, Nataraj K. Primary gastrointestinal mucormycosis in an immunocompetent person. *J Postgrad Med*. 2008;54(3):211.
- Davila RM, Moser SA, Grosso LE. Renal mucormycosis: a case report and review of the literature. *J Urol*. 1991;145(6):1242-4.
- Kauffman CA, Malani AN. Zygomycosis: an emerging fungal infection with new options for management. *Curr Infect Dis Rep*. 2007;9(6):435-40.
- Lanternier F, Sun HY, Ribaud P, Singh N, Kontoyiannis DP, Lortholary O. Mucormycosis in organ and stem cell transplant recipients. *Clin Infect Dis*. 2012;54(11):1-8.
- Chakrabarti A, Das A, Sharma A, Panda N, Das S, Gupta K, et al. Ten years' experience in zygomycosis at a tertiary care centre in India. *J Infect*. 2001;42(4):261-6.
- Blair JE, Fredrikson LJ, Pockaj BA, Lucaire CS. Locally invasive cutaneous *Apophysomyces elegans* infection acquired from snapdragon patch test. Elsevier; 2002: 717-720.
- Roden MM, Zaoutis TE, Buchanan WL, Knudsen TA, Sarkisova TA, Schaufele RL, et al. Epidemiology and outcome of zygomycosis: a review of 929 reported cases. *Clin Infect Dis*. 2005;41(5):634-53.
- Ingram CW, Sennesh J, Cooper JN, Perfect JR. Disseminated zygomycosis: report of four cases and review. *Rev Infect Dis*. 1989;11(5):741-54.
- Raghavan R, Date A, Bhaktaviziam A. Fungal and nocardial infections of the kidney. *Histopathology*. 1987;11(1):9-20.
- Chugh K, Sakhuja V, Gupta K, Jha V, Chakravarty A, Malik N, et al. Renal mucormycosis: computerized tomographic findings and their diagnostic significance. *Am J Kidney Dis*. 1993;22(3):393-7.
- Pahwa M, Pahwa AR, Girotra M, Chawla A. Isolated renal mucormycosis in a healthy

immunocompetent patient: atypical presentation and course. Korean J Urol. 2013;54(9):641-3.

13. Sriranga R, Pawar S, Khot W, Nischal N, Soneja M, Venkatesh H, et al. Isolated renal mucormycosis. J Assoc Physicians India. 2017;65:77-81.

**Cite this article as:** Ghuliani D, Puttaswamy R, Sahni K, Tomar R. Incidental isolated renal mucormycosis in immunocompetent patient: a rare and atypical presentation. Int Surg J 2020;7:1292-5.