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ISOLATED INVASIVE RENAL ASPERGILLOSIS MASQUERADING AS MALIGNANCY: EMERGENCE OF A NEW COVID-19 SEQUELA?

Dr. Rohit Sanjay Deshpande	Senior Resident, Department of Urology, PGIMER, Chandigarh.
Dr. Girdhar Singh Bora	Associate Professor, Department of Urology, PGIMER, Chandigarh.
Dr. Amanjit Bal	Professor, Department of Histopathology, PGIMER, Chandigarh.
Dr. Ravimohan Mavuduru*	Professor, Department of Urology, PGIMER, Chandigarh. *Corresponding Author

KEYWORDS :

INTRODUCTION

Symptoms of some fungal diseases can be similar to those of COVID-19, including fever, cough and shortness of breath[1]. COVID-19 can become complicated by secondary invasive fungal infections (IFIs), stemming primarily from severe lung damage and immunologic deficits associated with the virus or immunomodulatory therapy. The reported incidence of IFI has varied, often related to heterogeneity in patient populations, surveillance protocols, and definitions used for classification of fungal infections[4].

The most common fungal infections in patients with COVID-19 include aspergillosis or invasive candidiasis.

While a case report of localized renal candidiasis presenting as a mass mimicking a renal cell carcinoma has been reported in 2012 [2], no report of invasive aspergillosis of the kidney has been reported, especially during the raging worldwide pandemic of COVID-19.

Herein, we report a case of isolated invasive renal aspergillosis in a patient who was diagnosed with COVID-19, treated in an ICU setting, and after recovering from COVID-19 infection, developed a renal mass which on evaluation was suspected to be a renal malignancy but on histopathological examination after surgical extirpation, revealed invasive renal aspergillosis.

MATERIALS & METHODS

A 57-year-old male patient, with a positive family history of COVID-19 initially had symptoms of low-grade fever with cough, sore throat, breathlessness and vomiting in October 2020, for which he took over-the-counter medications for 5-6 days at home and then consulted a private practitioner in view of falling oxygen saturation levels, and was admitted to an intensive care unit (ICU), after being diagnosed with a positive COVID-19 RT-PCR report. Patient was discharged from the ICU after being treated for 15-20 days.

After a year, patient was diagnosed with a urinary tract infection (UTI), presenting as recurrent episodes of fever, was admitted at a private institute and upon further evaluation with contrast-enhanced computed tomography of the abdomen & was reported to have pyelonephritic changes with focal nephronia in the left kidney. A left percutaneous nephrostomy was inserted. Fine-needle aspiration cytology of the left upper polar renal lesion was negative for acid-fast bacilli, fungal elements and malignant cells.

Initially, the patient was treated with antibiotics directed at treating the recurrent fever episodes and UTI (starting with injectable Cefuroxime and Amikacin, then Tigecycline and finally Liposomal Amphotericin-B). Extirpative surgery of the left kidney (laparoscopic radical nephrectomy) was done. After confirmation of the suspected renal pathology, by histopathological examination, injectable voriconazole was started and then switched over to tablet voriconazole, after the attainment of satisfactory trough levels of serum voriconazole. Following investigations were done:

- *Triphasic CECT Abdomen: Left kidney shows an ill-defined heterogeneously enhancing mass lesion causing contour bulge at the upper pole, of size 60*58*51 mm (craniocaudal*transverse* antero-posterior), reaching till the level of the renal hilum with perinephric fat stranding. Another separate mass lesion of size 17*19 mm craniocaudal*transverse) is seen at the left renal mid-pole. Both the lesions likely to be malignant. Multiple retroperitoneal sub centimetric lymph nodes are seen at the level of renal hila, with few showing central hypodensity-? necrosis.*
- *Non-contrast CT of the chest: Suggestive of post-COVID-19 sequelae.*
- *Contrast-enhanced ultrasound (CEUS) of the left kidney: There is presence of a hetero-echoic lesion measuring approximately 5.3*4.7 cm seen in the upper pole of the left kidney with no anechoic components. No calcification seen. On CEUS, the lesion shows thick nodular enhancing internal septae with non-enhancing intervening areas. Findings suggestive of Bosniak type IV left renal cyst-? Cystic renal cell carcinoma.*
- *Dihydrorhodamine (DHR) assay (also known as NOXB1 assay): Not consistent with Chronic Granulomatous Disease.*
- *Galactomannan Antigen for Aspergillus (using Platiellia, Bio Rad kit), Galactomannan (GM) Index: 0.42*
- *Urine for Fungal Culture: Negative*

RESULTS

Intra-operative findings (during the standard 3-port radical nephrectomy): Dense perinephric adhesions were noted to be present; no exophytic growth noted. On cut section, thick purulent material noted in the pelvicalyceal system; no solid mass noted.

Till the time of publishing this article, the patient has been keeping good health and normal creatinine values. The patient has been asked to follow-up with kidney function tests, every 3 months, and to avoid nephrotoxic drugs. As of now, the patient is free of medications and continues to lead a normal healthy lifestyle.

DISCUSSION & CONCLUSIONS

Aspergillosis limited to the urinary tract is rare. Approximately 20 cases of renal aspergillosis including 3 with AIDS, 4 cases of isolated prostatic aspergillosis and 1 case of concomitant renal and prostatic aspergillosis in a non-immunocompromised patient have been reported. Not surprisingly, Aspergillus fumigatus was the most common isolate. Three different patterns of renal Aspergillus infection have been described (Flechner, 1981): disseminated aspergillosis with hematogenous renal involvement, aspergillosis of the renal pelvis with bezoars formation, and ascending panurothelial aspergillosis.

Renal parenchymal disease requires systemic antifungal therapy (amphotericin B, itraconazole, voriconazole or caspofungin), as for any other infected organ, although the efficacy of antifungal agents is not proven. A combined medical and surgical approach is required for pelvic disease, unlike in immunocompetent patients (esp. with renal mucormycosis) [6]. Topical and systemic antifungal agents and endourological access for extraction, lavage and debulking, or nephrectomy are required, depending on the anatomy, clinical judgment and the response to an initially 'conservative' approach.

Most patients require nephrectomy. This is not a welcome option for patients with bilateral disease[5].

It is important to elicit whether the patient has been infected with the SARS-CoV-19 virus in the past, in patients detected to have renal masses in the COVID-19 era. Renal masses, in the context of immunocompromised status, should always be viewed with suspicion with respect to harbouring fungal elements.

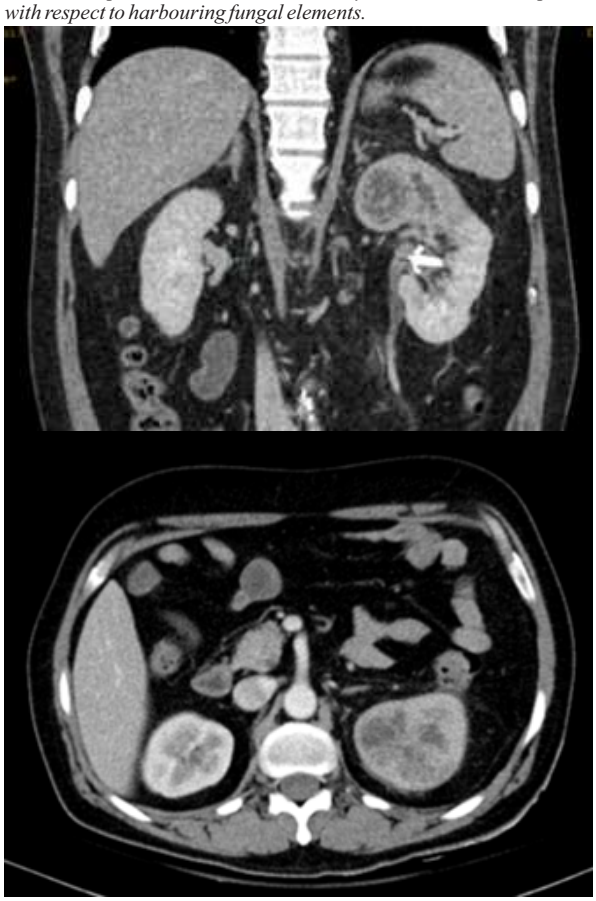

Fig.1 and 2: Pre-operative Triphasic CECT demonstrating an ill-defined heterogeneously enhancing mass lesion in the left kidney, causing contour bulge at the upper pole, of size 60 x 58 x 51 mm (cranio-caudal x transverse x antero-posterior) reaching till the level of the renal hilum, with a malecot catheter in-situ in the renal pelvis.

Fig.3: Post-operative image of the specimen removed after laparoscopic radical nephrectomy, showing pus interspersed with necrotic tissue in the upper pole of the left kidney, with a malecot catheter in-situ in the left renal pelvis.

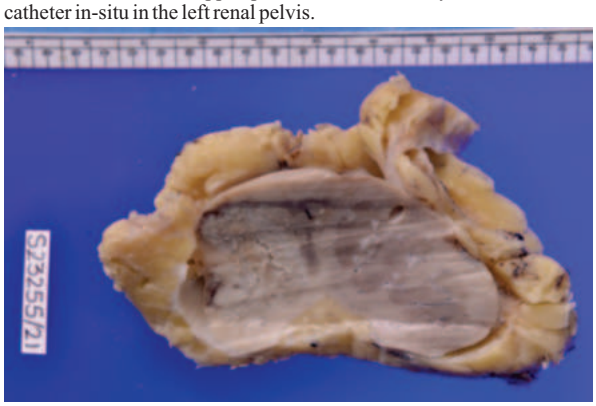

Fig.4: Formalin-fixed specimen of the involved kidney.

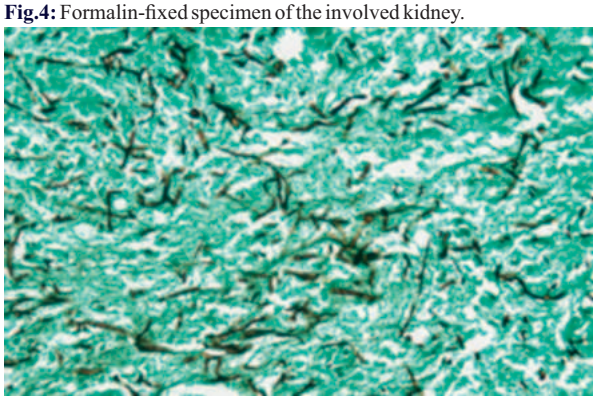

Fig.5: Grocott's stain highlighting septate fungal hyphae of Aspergillus.

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