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A Rare Case of Testicular Aspergillus fumigatus Abscess in a Renal Transplant Recipient Diagnosed on Fine Needle Aspiration Cytology'

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Dear Sir,

Testicular abscess is a rare complication of acute epididymo-orchitis and the majority of the infections are caused by bacteria (1). Common causative organisms include *Neisseria gonorhoae, Escherichia coli, Klebsiella pneumoniae, Pseudomonas aeruginosa,* and *Staphylococcus* species (1). Early diagnosis and appropriate management are important due to the risk of complications such as testicular infarction, Fournier's gangrene, and septicemia (1). Fungal abscesses are very rare, and mostly reported in immunocompromised patients including transplant recipients (2).

A 41-year-old male presented with complaints of left scrotal swelling, on and off for three months, which had increased in size in the last 10 days. It was associated with pain, vomiting, and fever for three days. No hematuria or lower urinary tract symptoms were present. He was normotensive and non-diabetic. The patient had undergone a live donor renal transplant four months ago for end-stage renal disease secondary to chronic glomerulonephritis and was on triple-drug (corticosteroid, mycophenolate mofetil, tacrolimus) immunosuppressive therapy. He also had a history of anti-thymocyte globulin induction for rejection.

The clinical diagnosis was epididymo-orchitis. On examination, the left testicular swelling measured 4 x 3 cm and was tender. Routine hematology investigations were within normal limits. The urine culture was negative. C-Reactive protein was elevated (29.26 mg/L, reference:0-7 mg/L). Scrotal ultrasound revealed a heterogeneously hypoechoic collection of 9 cc in the lower pole of the left testis, suggestive of testicular abscess. Testicular fine needle aspiration cytology (FNAC) was performed under ultrasound guidance and air-dried, and alcohol fixed smears were prepared and stained with Giemsa and Papanicolaou stains, respectively. Smears showed abundant necrosis, karyorrhexis debris, numerous neutrophils, and uniformly septate fungal hyphae branching at acute angles, resembling *Aspergillus* (Figure 1A,B). Gomori methenamine silver (GMS) stain was positive (Figure 1B inset). A diagnosis of acute necrotizing inflammation of fungal etiology (likely *Aspergillus* on morphology*)* was given, and fungal culture was recommended for definite species identification. A direct KOH mount showed thin septate hyphae with acute angle branching. Sabouraud dextrose agar (SDA) culture demonstrated dark greenish powdery colonies (Figure 1C). Lactophenol cotton blue (LPCB) showed uniseriate conidiophores with phialides on upper two-thirds of vesicles and round and smooth conidia, confirming *Aspergillus fumigatus* (Figure 1D). The patient was treated with itraconazole for 2 weeks.

Aspergillus is a ubiquitous filamentous fungus with nearly 24 species capable of causing disease in human beings (3). *A. fumigatus,* followed by *A. terreus* and *A. flavus,* is the most frequently encountered pathogen (3). Renal allograft recipients are at a higher risk of opportunistic infections due to immunosuppressive therapy, and *Aspergillus* is one of the most common opportunistic pathogens in this patient population (4). Invasive Aspergillosis is seen in 0.2-14% of renal transplant recipients, most frequently occurring within 6 months of transplantation (4, 5). Aspergillosis is a life-threatening opportunistic infection in renal transplant recipients, rendering dismal outcomes in the absence of a timely diagnosis. The mortality rate in renal transplant recipients ranges from 40% to 92% (5).

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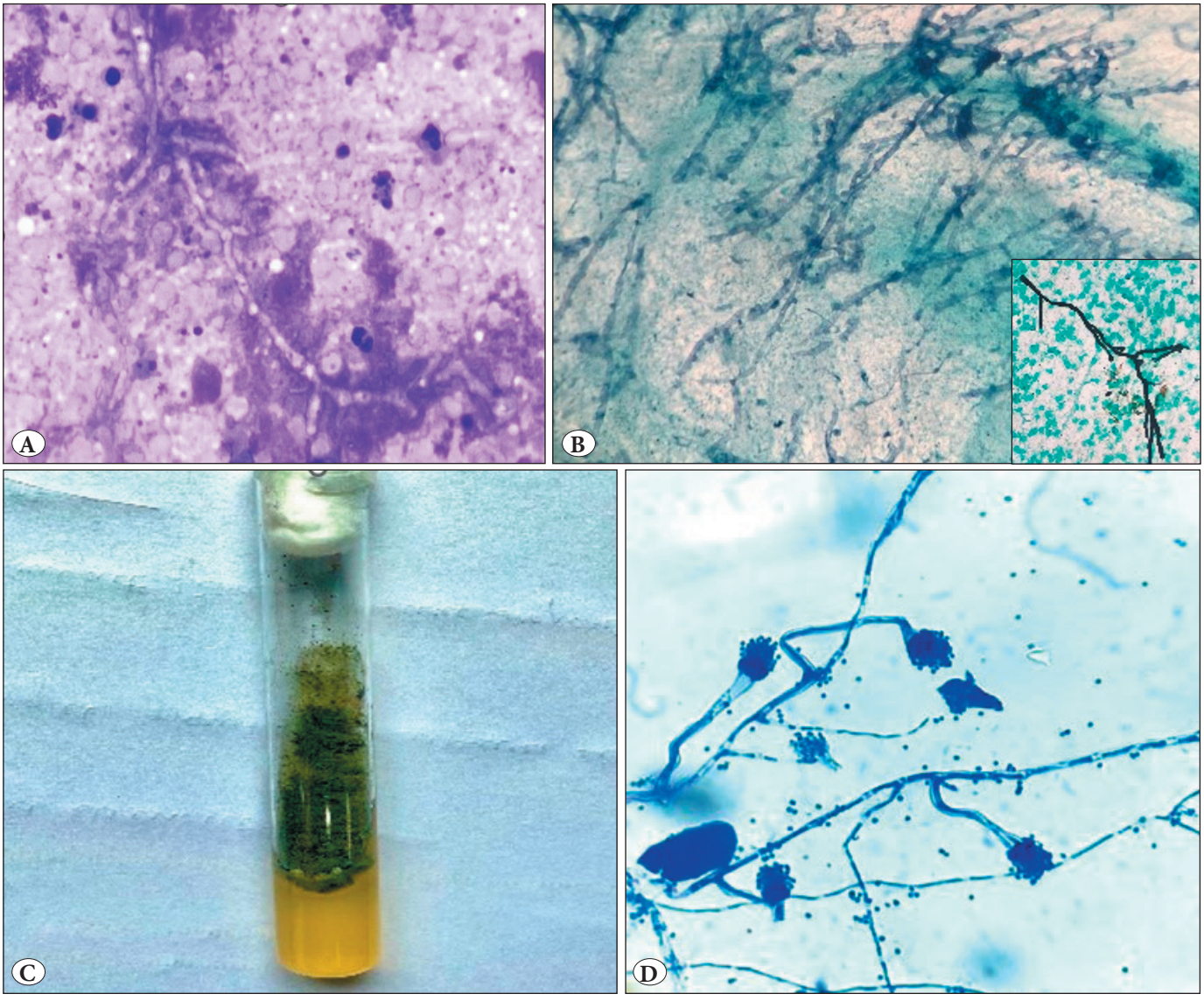

Figure 1: A,B) Smears show necrosis, karyorrhectic debris, neutrophils, and uniformly septate fungal hyphae branching at acute angles resembling *Aspergillus*. Gomori methenamine silver (inset) stain was positive. (Giemsa, x400; Papanicolaou stain, x400). **C)** SDA culture - Dark greenish powdery colonies. **D)** LPCB - Uniseriate conidiophores with phialides on upper 2/3rd of vesicles, conidia are round and smooth - *Aspergillus fumigatus*

The lung and the paranasal sinuses are the commonest sites of infection, followed by dissemination mainly to the central nervous system (5). Other organs such as the liver, heart, pancreas, kidney, eyes, spleen, endovascular sites, gastrointestinal tract, and genitourinary system can also be involved in disseminated disease (6). The testis is affected in <1% of cases of disseminated aspergillosis (6). Isolated testicular aspergillosis, as seen in the present case, is exceedingly rare. A high index of suspicion is key to the diagnosis of fungal infections. A careful search for organisms must be made in all aspirates from immunosuppressed patients, especially in the presence of necrosis and/or suppurative or granulomatous inflammation. *Aspergillus* shows septate hyphae with acute angle branching (6, 7). It can be differentiated from *Mucor*, another common opportunistic fungus also capable of angioinvasion, based on cytomorphological features as *Mucor* has broad, non-septate hyphae and right-angled branching (7). Definite species identification requires fungal culture (7). *Aspergillus* releases the cell wall component galactomannan during tissue invasion; hence, the serum galactomannan enzyme-linked immunosorbent assay is being widely used as a specific diagnostic test for invasive aspergillosis in solid-organ-transplanted individuals (4, 5).

FNAC with rapid on-site evaluation with appropriate triage of material for special stains/ancillary testing such as cultures will help render a quick and accurate diagnosis, thus improving patient outcomes. An extensive literature search revealed only two cases of isolated testicular *Aspergillus* abscess, reported on histopathology (6). The present case is the first case diagnosed on FNAC. It highlights the role of FNAC in early diagnosis and treatment of infections in this vulnerable population.

Conflict of Interest
The authors have no conflict of interest.

Authorship Contributions
Concept: **KK,** Design: **MA,** Data collection and/or processing: **AR, PS,** Analysis and/or interpretation: **KK, AR, PS,** Literature search: **KK, MA,** Writing: **MA,** Approval: **KK.**

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