Iranian Journal of Pathology (2012)7 (1), 53 - 57

Case Report

Scrotal Aspergillosis Associated with Fournier's Gangrene in a Patient with Cirrhosis

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ABSTRACT

Pulmonary aspergillosis is a well known entity occurring in immunocompetent persons. Cutaneous aspergillosis, on the other hand, has been described in cases of suppressed immunity. Recently, invasive aspergillosis has been reported in patients with subtle immune dysfunction such as those with critical illness and advanced cirrhosis. We report a case of scrotal aspergillosis in association with Fournier's gangrene and necrotizing fasciitis in a patient with cirrhosis.

Key words: Scrotum, Aspergillosis, Liver Cirrhosis

Introduction

Aspergillosis is a common infection occurring in the lung, while invasive and disseminated aspergillosis is especially common in immunocompromised patients. Traditionally, invasive aspergillosis is known to occur in patients with well established risk factors like neutropenia, hematologic malignancies, organ transplantation or acquired immunodeficiency syndrome (AIDS). Recent studies have thrown light on its role in other groups including those on low dose corticosteroids, patients with chronic obstructive pulmonary disease, liver cirrhosis and diabetes mellitus (1). Cutaneous aspergillosis usually involves sites of traumatic inoculation, sites associated with occlusive dressings, burns or surgery. It also occurs as a result of contiguous extension to the skin from infected underlying structures or from widespread blood-borne seeding of skin (1). Genitourinary aspergillosis is a rare involvement with only a few reports documented in the literature (2-4). Of late, subtle immunosuppression in cases of advanced cirrhosis has also been found to predispose to invasive

Received: 7 January 2011
Accepted: 8 May 2011
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aspergillosis. We report this case of scrotal aspergillosis in association with Fournier's gangrene and necrotizing fasciitis in a patient with cirrhosis, highlight the occurrence of aspergillosis in cases of liver cirrhosis, and also to stress on the fact that it should be considered as a differential diagnosis in such cases.

Case history

A 28 year old male presented with swelling of right lower limb and scrotum since 7 days, following a stick injury in the leg. On examination, the swelling was seen in the right lower leg extending up to the knee joint, with watery discharge and a superficial ulcer measuring 10×8 cm. The scrotum showed a superficial ulcer with foul smelling discharge, edema and tenderness. His retroviral status was negative. Hematological and serological investigations were within normal limits. Prothrombin time and aPTT were slightly elevated. Serum albumin was decreased (1.6 mg/dl), ALT (68 mg/dl) and blood urea (133 mg/dl) were elevated.

Ultrasonography and Doppler of scrotum showed bilateral small testis with normal vascularity, scrotal wall thickening with subcutaneous edema, without gas within scrotal wall. Venous doppler of right lower limb demonstrated subcutaneous edema of right leg, without evidence of deep vein thrombosis in the right lower limb. Upper gastroscopy revealed esophageal varices and superficial gastric ulcers. Ultrasound abdomen and pelvis showed cirrhosis of liver and portal hypertension with porto-systemic collaterals.

A clinical diagnosis of necrotising fasciitis of the lower limb and Fournier's gangrene of scrotum was rendered and debridement of right lower limb and scrotum was done. Grossly, the specimen consisted of a flattened skin covered tissue with focal discolouration and necrotic areas (Fig. 1). Histological examination of the specimen showed necrosed scrotal skin with surface colonization by bacteria and septate hyphae with thin, parallel walls and acute angle dichotomous and progressive branching typical of *Aspergillus* species (Fig. 2). Periodic acid schiff (Fig. 3) and Gomori's methanamine silver staining confirmed the diagnosis and demonstrated angioinvasion by fungal hyphae (Fig. 4). Biopsy of the skin from right lower limb showed features of necrotizing fasciitis with ulcerated epidermis, dense hemorrhagic infarction of the dermis, thrombosed vessels and colonization by bacteria.

Fig. 1: Flap of skin tissue with areas of discolouration

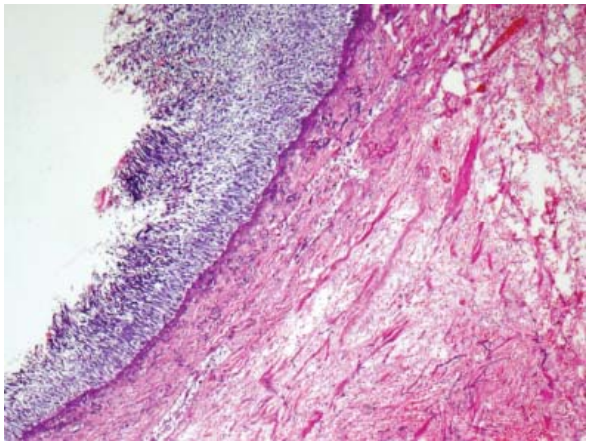

Fig. 2: Photomicrograph showing ulcerated epidermis covered by colonies of septate, acute angle branching hyphae of *Aspergillus* (H&E×100)

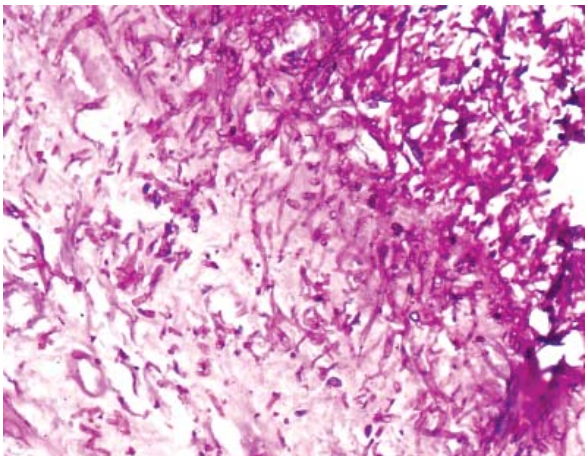

Fig. 3: Photomicrograph showing thin septate hyphae of *Aspergillus* (PAS×200)

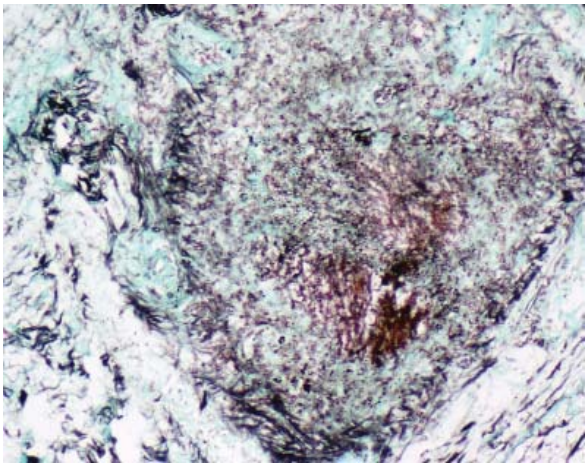

Fig. 4: Photomicrograph showing angioinvasion by fungal hyphae (GMS×200)

Postoperatively, the patient improved with treatment and was discharged subsequently. However, chest X-ray did not reveal any significant lung pathology. On follow up, the patient developed esophageal candidiasis, further confirming his immunocompromised status. However, the patient ultimately succumbed to the disease a month later.

Discussion

Aspergillosis is an opportunistic infection occurring as a complication in severe debilitating illnesses, including malignancies, tuberculosis, silicosis, diabetes and immunocompromised patients such on long term steroids, antibiotics, cytotoxic drugs, and in neutropenia. Cutaneous aspergillosis is a rare form of locally invasive disease. Primary cutaneous aspergillosis usually involves sites of skin injury, namely, at or near intravenous access catheter sites, at sites of traumatic inoculation, and at sites associated with occlusive dressings, burns, or surgery. Secondary cutaneous lesions result either from contiguous extension to the skin from infected underlying structures or from widespread bloodborne seeding of the skin. Non-HIV-infected immunocompromised patients with cutaneous aspergillosis revealed five major groups at risk for this infection: burn victims, neonates, individuals with cancer, bone marrow transplant recipients, and solid organ transplant recipients. In these non-HIV-infected patients with cutaneous aspergillosis, the clinical manifestations, approach to therapy, and outcomes vary significantly depending on the underlying risk (1).

Aspergillosis is the third most common opportunistic fungus, affecting patients with malignancy. In about 5% of patients with invasive aspergillosis, haematogenous spread of infection gives rise to cutaneous lesions. This commences as a single or multiple painful lesions, such as erythematous papules, nodules or plaques (2). These lesions are often associated with central ulcers and black eschars. To our knowledge, there are only 3 reported cases of scrotal aspergillosis in the English literature and electronic media. The first case of scrotal aspergillosis was described by Powell *et al.* (3). In a 17-year-old man who had a relapse of acute myelogenous leukemia 8 months after recei-ving bone marrow transplant. During indu-ction chemotherapy, he developed fungal sinusitis (*Rhizopus* species). Later on, he developed a 2 cm black lesion on the superior left hemiscrotum, bi-

opsy of which revealed angioinvasive fungal hyphae consistent with *Aspergillus*. Surgical intervention with partial scrotectomy was performed. The second case of aspergillosis involving the scrotum was reported by Davido *et al.* (4), in which the patient did well with conservative medical management. In the third case, a 33 year old with acute myelogenous leukemia who had undergone stem cell transplantation, developed genital cutaneous lesions, showing hyphal forms of *Aspergillus* on histopathological examination. This case was also treated conservatively without any surgical management (2). Few case reports of primary cutaneous aspergillosis in immunocompetent patients have also been cited in the literature (5, 6).

In our case, there is no apparent predisposing cause for immunodeficiency, other than chronic liver disease and cirrhosis. Liver disease alone predisposes to bacterial and fungal infections, as a result of a depression of both humoral and cell-mediated immunity. Cirrhosis is strongly associated with an increased risk of sepsis and acute respiratory failure. Opportunistic infections usually associated with profound immunosuppression, especially cryptococcal peritonitis, (7) have been reported in cirrhotic patients, without any obvious immunosuppression. In addition, acute liver failure promotes fungal infections. In addition, the T-lymphocyte count is inversely related to the severity of cirrhosis. Liver disease in addition is associated with defects in neutrophil migration and phagocytosis and superadded weakened immune system due to steroid treatment, blood transfusions and malnutrition (8, 9).

For accurate diagnosis of cutaneous aspergillosis, a skin biopsy of the lesion with histological evaluation and silver staining should be performed. Ideally, culture studies should be performed out to confirm the microscopic findings (1). In our case, though histological sections demonstrated *Aspergillus* filaments, repeated cultures including blood did not yield positive fungal colonies. Acute angle branching of aspergillosis is similar to those seen in *Pseudallescheria boydii* and *Fusarium* species, however, the progressive dichotomous acute angle branching and the parallel orientation of the branches helped us to differentiate from the latter two. *Pseudallescheria boydii* shows haphazard and random branching and *Fusarium* spp. shows right angle and random branching. Pseudohyphae of *Candida* may also mimic *Aspergillus*, but they are aseptate (10).

Pre-operatively, fungal cultures were not performed as it was not suspected clinically and the patient succumbed to the disease. However, cultures of the leg wound and that from scrotum sent post-operatively yielded polymicrobial growth. Surgical intervention was probably curative temporarily in this case with subsequent improvement in the patient's overall status. Ideally, even though, histopathologic diagnosis should be confirmed by culture or immunologic techniques, in cases like ours, we had to rely on histopathologic diagnosis and base our treatment on the same.

In conclusion, we would like to stress the importance of histological examination of surgical specimens obtained from debridement specimen for Fournier's gangrene and necrotizing fasciitis. We would like to affirm that invasive aspergillosis can occur in patients other than those with apparent immunosuppression, like cirrhosis and stress the rarity of occurrence of scrotal aspergillosis.

Acknowledgements

The authors declare that there is no conflict of interests.

References

1. van Burik JA, Colven R, Spach DH. Cutaneous aspergillosis. J Clin Microbiol 1998;36(11):3115-21.

2. Chen Z, Li HM, Han W, Sang JH, Du J, Zhang WJ, *et al.* Genital cutaneous lesions in an allogeneic haematopoietic stem-cell transplant recipient with aspergillosis. Clin Exp Dermatol 2009;34(4):556-8.

3. Powell CR, Allshouse M, Bethel KJ, Mevorach RA. Invasive aspergillosis of the scrotum. J Urol 1998;159(4):1306-8.

4. Davido HT, Ryndin I, Kohler TS, Hadegard W, Monga M, Fung L. Aspergillosis of the scrotum: non-surgical management. Int J Urol 2007;14(2):164-6.

5. Mohapatra S, Xess I, Swetha JV, Tanveer N, Asati D, Ramam M, *et al*. Primary cutaneous aspergillosis due to *Aspergillus niger* in an immunocompetent patient. Indian J Med Microbiol 2009;27(4):367-70.

6. Romano C, Miracco C. Primary cutaneous aspergillosis in an immunocompetent patient. Mycoses 2003;46(1-2):56-9.

7. Singh DK, Tyagi I, Saran RK, Gondal R. Fatal spontaneous *Cryptococcal peritonitis* in a woman with decompensated liver cirrhosis. Acta Cytol 2010;54(5 Suppl):1087-9.

8. Lipke AB, Mihas AA. Non-decompensated cirrhosis as a risk factor for invasive aspergillosis: a case report and review of the immune dysfunction of cirrhosis. Am J Med Sci 2007;334(4):314-6.

9. Prodanovic H, Cracco C, Massard J, Barrault C, Thabut D, Duguet A, *et al*. Invasive pulmonary aspergillosis in patients with decompensated cirrhosis: case series. BMC Gastroenterol 2007;7:2.

10. Chandler F, Watts J. Pathologic Diagnosis of Fungal Infections. Chicago: ASCP press; 1987.