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Case Report

Invasive Pulmonary Arpergillosis with Intracranial Involvement

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ABSTRACT

Background: Invasive pulmonary aspergillosis is a rare entity especially with intracranial extension. Patients usually present with nonspecific signs and symptoms and need a high index of suspicion and prompt treatment because of high morbidity and mortality.

Case Description: 45 years old male patient presented with generalized symptoms diagnosed as pulmonary aspergillosis and later he developed neurological symptoms and found to have an intracranial spread of the infection.

Conclusion: Invasive pulmonary aspergillosis with intracranial involvement is a rare entity and needs a high index of suspicion for diagnosis. Also, it carries high morbidity and mortality.

Keywords: Invasive pulmonary aspergillosis; Diabetes mellitus; Hypertension; Hepatitis B

CASE PRESENTATION

A 56 years old male known case of diabetes mellitus, hypertension, and hepatitis B presented with generalized weakness, fever and dry cough. His baseline lab workup was within the normal limit but chest X-ray showed cavitation in the left lobe. CT scan chest with contrast was done which showed cavitating pulmonary infiltrate scattered throughout the lungs most likely representing pulmonary tuberculosis as shown in Figure 1. Bronchial wash sent for workup which showed *Aspergillus flavus* on fungal culture and fungal hyphae on microscopy (Figure 2).

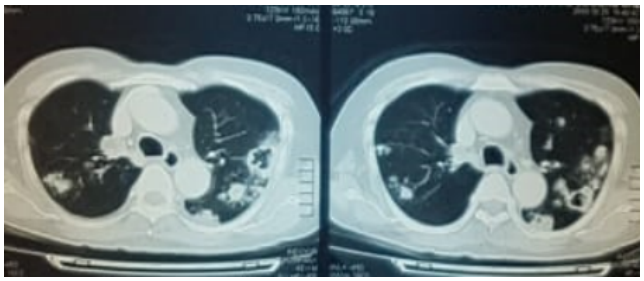

Figure 1: Pulmonary tuberculosis.

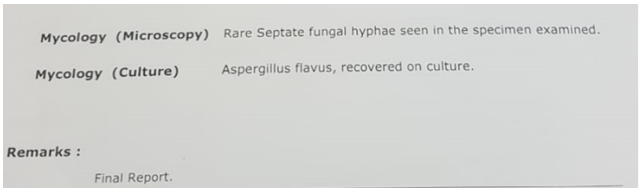

Figure 2: *Aspergillus flavus* on fungal culture and fungal hyphae on microscopy.

Antifungal treatment, voriconazole started but over a course of time patient gradually became drowsy and developed seizures for which the MRI brain was ordered and it showed the lobulated area in the right frontal region with surrounding edema mx 4.8 × 4.4 × 3.6 cm it shows restricted diffusion and peripheral post-contrast enhancement. Another abnormal intensity area saw in the left temporal region. Findings are most likely due to tuberculosis or fungal abscess (Figure 3).

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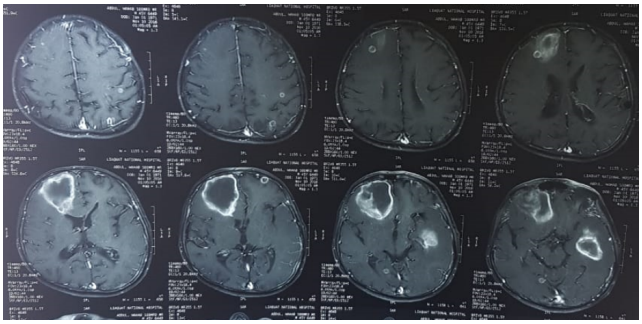

Figure 3: Antifungal treatment.

He underwent craniotomy and drainage of the abscess. Culture from brain abscess also showed *Aspergillus* species and negative for tuberculosis. He kept on antifungal treatment and discharged with regular OPD follow-ups.

DISCUSSION

Aspergillus spp. are acquired by inhalation of spores and can be life-threatening, especially in an immunocompromised individual [1]. Patients present with usually nonspecific symptoms. They may present with fever, cough, antibiotic therapy failure or hemoptysis [2]. Intra pulmonary Aspergillosis was first described in 1953 [3]. Its incidence has increased due to the use of immunosuppressive agents [4]. Major risk factors are transplantation, steroids, neutropenia and malignancy [1,5].

Histopathological diagnosis, by lung tissue biopsy, remains the 'gold standard' for the diagnosis of Intrapulmonary aspergillosis [6]. The presence of septate, branching hyphae invading the lung tissue and a positive culture for *Aspergillus* from the same site, is diagnostic of IPA. The chest radiograph shows nonspecific changes. Usual findings include pulmonary cavitations [7,8]. A high-resolution CT scan is useful [9]. CT chest findings include ill-defined nodules (67%), ground-glass appearance (56%), and consolidation (44%) [10].

Treatment is difficult and mortality is high. Is suspicion is high, start therapy as soon as possible. For many years Amphotericin B was the first line of therapy. It is now replaced by voriconazole. Patient receiving voriconazole has a highly favorable response as compared to amphotericin B [11].

Only a few published case reports and short series of invasive intracranial aspergillosis exist in literature. More common in immunocompromised hosts but now new emerging cases shows the involvement of immunocompetent host. Increase survival renders patients susceptible to fungal infection [12].

Invasive intracranial aspergillosis can manifest as meningitis, meningoencephalitis, and intracranial abscess and as a granuloma [13,14]. Granuloma is the most common presentation [15]. Intracranial spread may occur from the hematogenous route [16]. MRI brain with contrast is a diagnostic tool for intracranial lesions [17]. Ring enhancing lesion on contrast MRI is suggestive of an abscess but for definitive diagnosis fungal culture and biopsy should be sent after taking a sample from brain tissue. Load patients with voriconazole preoperatively because it has good penetration through the blood-brain barrier [17-19]. Postoperatively patients should continue on the same drugs for a long period of time. No definitive management protocol has been defined. Postoperative mortality is mainly because of herniation, ischemia and hydrocephalous [1,20].

CONCLUSION

Invasive pulmonary aspergillosis with intracranial involvement is a rare entity and needs a high index of suspicion for diagnosis. Also, it carries high morbidity and mortality.

REFERENCES

1. Soubani AO, Chandrasekar PH. The clinical spectrum of pulmonary aspergillosis. BMJ. 2002;121:1988-1999.
2. Albelda SM, Talbot GH, Gerson SL, Miller WT, Cassileth PA. Pulmonary cavitation and massive hemoptysis in invasive pulmonary aspergillosis. Influence of bone marrow recovery in patients with acute leukemia. Am Rev Respir Dis. 1985;131:115-120.
3. Rankin NE. Disseminated aspergillosis and moniliasis associated with agranulocytosis and antibiotic therapy. Br Med J. 1953;1:918-919.
4. Chamilos G, Luna M, Lewis RE, Bodey GP, Chemaly R, Tarrand JJ, et al. Invasive fungal infections in patients with hematologic malignancies in a tertiary care cancer center: an autopsy study over a 15-year period (1989-2003). Haematologica. 2006;91:986-989.
5. Gerson SL, Talbot GH, Hurwitz S, Strom BL, Lusk EJ, Cassileth PA. Prolonged granulocytopenia: the major risk factor for invasive pulmonary aspergillosis in patients with acute leukemia. Ann Intern Med. 1984;100:34-51.
6. Ruhnke M, Bohme A, Buchheidt D, Donhuijsen K, Einsele H, Enzensberger R, et al. Diagnosis of invasive fungal infections in hematology and oncology-guidelines of the infectious diseases working party (AGIHO) of the German society of hematology and oncology (DGHO). Ann Hematol. 2003;82:141-148.
7. Libshitz HI, Pagani JJ. Aspergillosis and mucormycosis: Two types of opportunistic fungal pneumonia. Radiology. 1981;140:301-316.
8. Kuhlman JE, Fishman EK, Siegelman SS. Invasive pulmonary aspergillosis in acute leukemia: characteristic findings on CT, the CT halo sign, and the role of CT in early diagnosis. Radiology. 1985;157:611-614.
9. Caillot D, Mannone L, Cuisenier B, Couaillier JF. Role of early diagnosis and aggressive surgery in the management of invasive pulmonary aspergillosis in neutropenic patients. Clin Microbiol Infect. 2001;7:54-61.
10. Heussel CP, Kauczor HU, Heussel GE, Fischer B, Begrich M, Mildenberger P, et al. Pneumonia in febrile neutropenic patients and in bone marrow and blood stem-cell transplant recipients: Use of high-resolution computed tomography. J Clin Oncol. 1999;17:796-805.
11. Herbrecht R, Denning DW, Patterson TF, WinFried V. Ken, Kieren A. Marr, Patricia Rbaud, et al. Voriconazole versus amphotericin B for primary therapy of invasive aspergillosis. N Engl J Med. 2002;347:408-415.
12. Dubey A, Patwardhan RV, Sampth S, Santosh V, Kolluri S, Nanda A. Intracranial fungal granuloma: analysis of 40 patients and review of the literature. Surg Neurol. 2005;63:254 -260.
13. Ho CL, Deruytter MJ. CNS aspergillosis with mycotic aneurysm, cerebral granuloma and infarction. Acta Neurochir (Wien). 2004;146:851-856.

14. Alsultan A, Williams MS, Lubner S, Goldman FD. Chronic granulomatous disease presenting with disseminated intracranial aspergillosis. Pediatr Blood Cancer. 2005.
15. Sharma BS, Khosla VK, Kak VK, Banerjee AK, Vasishtha RK, Prasad KS, et al. Intracranial fungal granuloma. Surg Neurol. 1997;47:489-497.
16. Hall WA. Neurosurgical infections in the compromised host. Neurosurg Clin N Am. 1992;3:435-442.
17. Yamada K, Shrier DA, Rubio A, Shan Y, Zoarski GH, Yoshiura T, et al. Imaging findings in intracranial aspergillosis. Acad Radiol. 2002;9:163-171.
18. Yamanoi T, Shibano K, Soeda T, Hoshi A, Matsuura Y, Sugiura Y, et al. Intracranial invasive aspergillosis originating in the sphenoid sinus: a successful treatment with high-dose itraconazole in three cases. Tohoku J Exp Med. 2004;203:133-139.
19. Goel A, Nadkarni T, Desai AP. Aspergilloma in the paracavernous region-two case reports. Neurol Med Chir.1996;36:733-736.
20. Zheng L, Okabe S, Hino K, Kohno T, Kamata K. Intracranial fungal granuloma with CSF space dissemination: a case report. No Shinkei Geka. 1996;24:389-392.