Invasive Vertebral Aspergillosis in Immunocompetent Patient: A Rare Case Report with Review of Literature

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ABSTRACT

Invasive vertebral aspergillosis in an immunocompetent individual is extremely rare. Till today only fifteen cases of aspergillus vertebral osteomyelitis in immunocompetent patients are reported in available English literature. Here we are reporting a case of Invasive vertebral aspergillosis in immunocompetent male who presented with chronic backache and paraparesis. Patient was successfully treated by decompressive laminectomy with pedical screw fixation and histopathology was suggestive of Aspergillosis. Patient improved neurologically and on 15 months followup paraparesis of patient improved with no complains of previously persisting backache. Patient regained his job with occasional pain in back on prolonged sitting and weight lifting.

KEY WORDS: Aspergillosis, laminectomy, osteomyelitis, paraparesis

INTRODUCTION

Central nervous system (CNS) Aspergillosis is more common in immunocompromised patients usually involving the brain and rarely involving the spine in the form of vertebral body osteomyelitis. It usually spreads from lung lesion. Invasive vertebral aspergillosis without any primary source of aspergillus infection in immunocompetent person is even rare. Till date only fifteen cases have been reported of invasive vertebral aspergillosis in immunocompetent individuals, among them only five cases have no primary source of infection and our reported case is the sixth (15).

CASE REPORT

A 59 years old man, Government servant, presented with complaint of backache since one and half years and difficulty in walking since one month duration. Pain was dull aching, non radiating and temporarily relieved by rest, and had increased in intensity since one month. No history of any trauma or any chronic illness was present. Neurological examination revealed power grade 3/5 in bilateral lower limb with exaggerated bilateral knee and ankle reflexes. Bilateral Babinski sign was positive. No bladder and bowel involvement was noted. Sensory functions were normal. No gross spinal deformity was seen. Gadolinium enhanced MRI spine showed marrow infiltrative lesion at Dorsal D4-D5 vertebral level involving body and post elements associated with cortical erosion and abnormal soft tissue component suggestive of neoplastic etiology (Figure 1). Computed tomography scan (CT scan) dorsal spine showed lytic lesion in D4-D5 vertebra (Figure 2). CT scan abdomen and thorax was done to rule out any primary, which was unremarkable. Bone marrow density was normal, serum protein electrophoresis showed increased beta proteins. Whole body bone scan did not show any evidence of osteolytic lesion anywhere in skeleton (Figure 3). General and systemic evaluation did not reveal any manifestation of acquired immunodeficiency syndrome. A decision was made to post the patient for decompressive laminectomy, biopsy and fixation.

The operation was done with standard posterior midline approach. Following skin incision and muscle dissection D4 and D5 decompressive laminectomy was performed and...
Figure 1: A) T1W1 sagittal MR image showing D4 vertebral body and D4-D5 intervertebral disc involvement. B) T2W2 sagittal MR image showing marrow infiltrative lesion at Dorsal D4-D5 vertebral level involving body with cortical erosion and abnormal soft tissue component. C) T2W2 axial MR image showing marrow infiltrative lesion at D4 vertebral level involving body with cortical erosion.

Figure 2: CT scan of dorsal spine showing lytic lesion involving D4 and D5 vertebrae.
biopsy tissue was taken from the involved part of D4 vertebra. Pedicle screw fixation was done between D3 and D6. Direct fluorescence for acid fast bacilli (AFB) was negative. On decalcifying the bony tissue biopsy, histopathology showed bony trabeculi necrotic background and septate hyphae with branching primarily at acute angles. Numerous conidial heads of aspergillus fumigatus were also found on special stains. The tissue was submitted for fungal culture which showed aspergillus fumigatus fungal organism (Figure 4). Surrounding soft tissue showed dense infiltration by chronic inflammatory cells and plasma cells, overall morphology was in favour of aspergillosis osteomyelitis.

Figure 3: Whole body bone scan did not show any evidence of osteolytic lesion anywhere in skeleton.

Figure 4: A) HE Stain 100X is suggestive of aspergillosis, note the presence of mycelia and conidial heads of aspergillus fumigatus fungal organism. B) HE Stain 40X shows bony trabeculae with septate hyphae.
After diagnosis of aspergillus osteomyelitis, the patient's sputum culture was done, which did not reveal any fungal growth. Antifungal treatment in the form of oral Itraconazole 200 mg twice a day was started and patient was discharged on 9th post operative day. At fifteen months follow up the patient is doing well without any pain or difficulty in walking.

**DISCUSSION**

Fungal infections of the CNS are being increasingly diagnosed both in immunocompromised and immunocompetent individuals. Aspergillosis, an infrequent opportunistic fungal infection primarily occurs in immunocompromised patients. Central nervous system infections caused by aspergillus species are uncommon, and infection involving the vertebra is considered to be a rare event (16), which occurs with the typical radiological features of the nonsuppurative osteomyelitis. Most of the patients with CNS aspergillosis reported from the Indian subcontinent are otherwise immunocompetent (16). Upper thoracic level of spinal cord is most commonly affected, caused by contiguous spread from lung (19). Vertebral column involvement by aspergillus resulting in paraplegia has been reported by some workers mostly outside India (19).

Aspergillus infection of the central nervous system though considered rare is showing an increasing trend (6). The commonest underlying conditions favouring spread to CNS include transplantation, malignancy, cytotoxic agents, chronic asthma, steroid use, AIDS, thermal burns, hepatic failure and surgical procedures. In India, sinocranial form of aspergillosis is the most common form of CNS aspergillosis (10).

Aspergillus involves the spine with the typical radiographic features of nonsuppurative vertebral osteomyelitis. Invasive vertebral aspergillosis occurs less commonly and invariably needs surgical intervention which shows better prognosis than the secondary counterpart (5).

Aspergillus invasion in an immunologically competent individual has a better prognosis. Till date, 15 cases of invasive vertebral aspergillosis in immunocompetent individuals has been published as case reports in available English literature, among them only five cases have no primary source of infection and our reported case is the sixth (Table 1).

Host defence against the aspergillus species is considered to be a function of neutrophils; therefore invasive vertebral aspergillosis is relatively uncommon in human immunodeficiency virus (HIV), a disorder of lymphocyte function but is a common cause of fungal infections in chronic granulomatous disease which is characterized by a defect in phagocytic neutrophils. Patients being treated with corticosteroids, such as transplant recipients, are also susceptible because these drugs potentiate risk for aspergillus infection by decreasing intracellular killing of spores by macrophages, thereby allowing intracellular germination.

Histopathologically, marked necrosis, hemorrhage and extensive granuloma formation is seen in the epidural and subdural spaces, Aspergillus hyphae may penetrate the myelin sheath and result in myelomalacia. Abscesses and vertebral destruction may also be seen.

CSF examination has been found to be of no value in the diagnosis of CNS aspergillosis (2). Definitive diagnosis depends on the demonstration of causal agents in tissue samples. Other fungi such as Pseudallescheria boydii, Scedosporium inflatum, Chaetomium species can also cause clinically and pathologically similar lesions in the CNS. Stains such as Grocott's methenamine (GMS) silver help identify fungal hyphae. Culture identification of fungi causing vertebral osteomyelitis appears to be scarcely reported in literature (17).

Different therapeutic modalities have been proposed for the treatment of spinal aspergillosis. The primary treatment is medical but when spinal instability or symptoms of spinal cord or radicular compression are present, surgical decompression is indicated. Surgical drainage with systemic antifungal therapy is considered to be standard practice in such cases.

The drug of choice for invasive aspergillosis has historically been intravenous amphotericin B. Amphotericin B is highly nephrotoxic and attains low concentrations in bone leading to questionable efficacy when not combined with surgery.

Currently voricaonazole is recommended as the primary treatment of invasive aspergillosis, including CNS aspergillosis and osteomyelitis, with a recommendation for a strength of B-II for the latter (20). Voriconazole is administered intravenously (loading dose of 6 mg/kg q12h on day 1, followed by 4 mg/kg q12h), with the option to switch to oral therapy (200 mg b.i.d.) (8). Itraconazole, although successfully used in some case-reports, is recommended as an alternative therapy of invasive aspergillosis for refractory cases or cases intolerant to routine antifungal
therapy. The recommended dose of itraconazole in adults is 400 mg/day.

**CONCLUSION**

Although fungal vertebral osteomyelitis is relatively common in immunocompromised patient, its incidence is nowadays increasing in immunocompetent individuals. In differential diagnosis of indolent vertebral lesion in immunocompetent person, fungal vertebral osteomyelitis should be kept in mind with high degree of suspicion, as an early diagnosis and proper management gives better outcome.

**REFERENCES**


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