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# A RARE CASE OF CANDIDAL MENINGITIS IN IMMUNO-COMPETENT HOST

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## ABSTRACT

Candida species can invade and cause disease in virtually any organ of the body. Chronic meningitis is most common type of CNS involvement by Candidiasis. We are reporting a patient who came with headache, vomiting and fever after head injury by a sharp weapon used for cutting sugarcane. CSF examination showed neutrophilic predominance with low sugar and budding yeast cells of Candida. Through this case we want to communicate that fungal infection can occur after penetrating brain injury and should be especially looked in patient with persistent meningitis after antibiotic therapy. Also chronic meningitis by Candida can cause neutrophilic predominance in CSF and even occur in an immuno competent individual.

## INTRODUCTION

Candida species are part of the normal human flora. It can cause cutaneous and systemic Candidiasis. Candida species can invade and cause disease in virtually any organ of the body. However, there are many natural barriers to this form of disease, and it only occurs in individuals who have reduced or altered host defences. The term "Invasive Candidiasis" is more commonly used for the "Systemic Candidiasis," "Disseminated Candidiasis", and "Haematogenous Candidiasis". There are four types of invasive Candidiasis described in literature.<sup>1</sup> Central nervous system (CNS) involvement in cases of invasive Candidiasis is very rare.<sup>1</sup> Chronic meningitis is most common type of CNS involvement by Candidiasis. It is a serious condition and causes significant morbidity and mortality if not recognized and treated effectively. We are reporting an interesting case of Candida meningitis caused by interesting mode of injury.

## CASE REPORT

A 60 year male presented with history of head injury two months back by a sharp weapon used for sugar-

cane cutting. After about three week of injury he started having headache, vomiting, fever and loss of appetite. Patient was given treatment for pyogenic meningitis at various hospitals but did not get relief. Gradually he lost his memory and ability to recognize the family members in last two weeks. On examination patient was conscious but confused and vitals were in normal range. His CSF examination showed 450 cells/cumm with 100% neutrophils, glucose of 32 mg/dl (blood sugar of 98mg/dl) and protein of 216mg/dl. His MRI scan showed a fracture in skull bone with extension into meninges and brain parenchyma (fig. 1 & 2). CSF wet mount showed budding yeast cells (fig 3) and CSF fungal culture showed Candida species and bacterial culture was negative. His HIV status was negative and there was no known factor that could impair his immunity. Patient was treated with Liposomal Amphotericin-B and Fluconazole. His response to antifungal treatment was dramatic and he regained full consciousness after 10 days of therapy. Repeat CSF fungal culture was negative. Liposomal Amphotericin-B and Oral Fluconazole was continued for a total of 6 weeks. Patient was asymptomatic on follow up visit.

## DISCUSSION

Penetrating brain injuries are rare than compared to blunt brain injuries.<sup>2</sup> Most common cause of penetrating brain injury is gunshot injury. Fire arm injury is relatively aseptic in nature due to high temperature of penetrating object. Therefore the chances of CNS infection are low (10-11%) in penetrating brain injury due to fire arm.<sup>3</sup> Skull fracture in the region of frontal or ethmoid sinuses can rupture the dura and cause a CSF fistula which can become an entry port for organisms from the paranasal sinuses. 50-80% of such infections are caused by *S. pneumococcus*, rest caused by *H. influenzae* and group A streptococcus. Penetrating injuries and open wounds are typically infected by gram negative bacilli such as *E.coli*, *Klebsella* and *Pseudomonas*. After treatment of these infections, acute fungal meningitis with *Candida* infection has been observed.<sup>4</sup> All together fungal infection is very rare in penetrating head injury. In one series of about 964 cases only two cases had fungal infection.<sup>3</sup> Our case had a special mode of penetrating injury with a weapon that was used to cut sugarcane. Possibly this weapon had implanted *Candida* species to the brain through skull fracture seen on CT scan. It is well known that *Candida* species are present on sugarcane peels and most common being *Candida tropicalis*.<sup>5</sup>

Candidal infection comes after *Cryptococcus* and *Aspergillus* infection in the list of causes for fungal meningitis. Point that had indicated towards fungal infection in our case of chronic meningitis was low sugar and neutrophilic pleocytosis in CSF with long history. Persistent neutrophilic meningitis is well reported in infections with *Candida*,<sup>[6]</sup> *Aspergillus*, *Zygomycetes*, *Nocardia* and *Actinomyces*.<sup>7</sup> Smear examination of CSF is most common confirmatory test for the final diagnosis as Candidal growth is usually difficult in cultures unless special techniques are used.<sup>8</sup>

Factors, which encourage spread of *Candida* into CNS are prematurity in neonates, broad spectrum antibiotic therapy, hyper alimentation, malignancy, indwelling catheters, treatment with corticosteroids, neutropenia, abdominal surgery, diabetes, thermal injuries and parenteral drug abuse.<sup>9</sup> *Candida* can also involve the brain and subarachnoid space by direct extension via surgical trauma, ventriculostomy placement or ventricular shunts.<sup>9</sup> Penetrating injury causing implantation of *Candida* in the brain and subarachnoid space is very rarely reported.<sup>10</sup>

The successful treatment of *Candida* meningitis rests upon prompt diagnosis, early initiation of appropriate therapy and immune status of the host. The duration of treatment with Amphotericin B and Fluconazole ranges from 4 to 6 weeks according to various reports. Through this case we want to communicate that fungal infection can occur after penetrating brain injury and should be especially looked in patient with persistent meningitis after antibiotic therapy. Also chronic meningitis by *Candida* can cause neutrophilic predominance in CSF and even occur in an immuno competent individual.

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