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## Neonatal Cerebral Candida Abscess: Radiologic and Clinical Findings

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Insidious onset and lifethreatening complications from increased intracranial pressure and irreversibility of cerebral tissue damage, account for the poor prognosis of brain abscesses compared to similar lesions at other anatomical sites (1). We present here a case of candidial brain abscess as it is encountered very rarely in newborns.

A 3700 gram baby delivered vaginally at term. Apgar score was six at one, and seven at five minutes respectively, and then mild respiratory distress with cyanosis was occurred. The patient was transferred to the intensive care unit. Tachydyspnea and cyanosis appeared within 12 hours from delivery. In neurologic examination, only sucking reflex was weak and no other abnormality was detected in physical examination. The infant was hospitalized with the diagnosis of transient tachypnea and suspicion of bacterial sepsis. Also there was a full septic screen; culture of suprapubically aspirated specimens of urine, throat, stool, blood and cerebrospinal fluid, yielded negative results for both bacteria and fungus. Intravenous ampicillin and cefotaxime were administered empirically. After 15 days from delivery focal tonic seizures with eye deviation and progression movement (i.e., pedaling) began, and phenobarbital was administered on the follow up. A cranial computed tomography (CT) was performed. CT demonstrated two abscess like lesions with peripheral edema. One of the lesions was located at the head of the right caudate nucleus, and its diameter was 16 mm. The other one was located at the left capsula interna, and its diameter was 10 mm. Before contrast administration they were poorly circumscribed hypodense lesions. After contrast injection, their contours were enhanced and typical abscess

formation was revealed. Their central portions were evaluated to be more hyperdense than bacterial abscesses. Also a subgaleal lesion at the right temporoparietal region, not extending beyond the suture, was evaluated as cephalhematoma (Fig. 1 a-b).

The abscess formation located at the right caudate nucleus was aspirated surgically, and Candida albicans was cultured from the abscess material. So intravenous fluconazole treatment was begun. After 38 days of intravenous fluconazole treatment; CT investigation showed decrease in size of the abscesses and their peripheral edema, but two nodular lesions, enhancing after contrast infusion, were observed. Their diameters were 5 mm and located at the right frontal and right cerebellar locations. We evaluated these lesions as granulomatous microabscesses that were seen with cerebral candidiasis (Fig. 2). Oral fluconazole treatment was started because of the significant decrease in the size of the abscess formation and improvement in clinical status. Oral fluconazole treatment was maintained for six weeks, after the patient was discharged with clinical recovery. Fifty-six days after the onset of medical therapy, CT scan revealed only a small area of encephalomalacia at the level of right nucleus caudatus. Abscesses that were located at the left capsula interna and enhancing nodular lesions were disappeared (Fig. 3). Neurologic development one year after hospital discharge was normal.

Although candidal colonization of the oral mucous membrane, perineal skin, and gastrointestinal tract is common, its systemic dissemination is rare (2-9). Invasive therapeutic procedures, prolonged hospitalization, and prolonged uses of broad spectrum antimicrobial

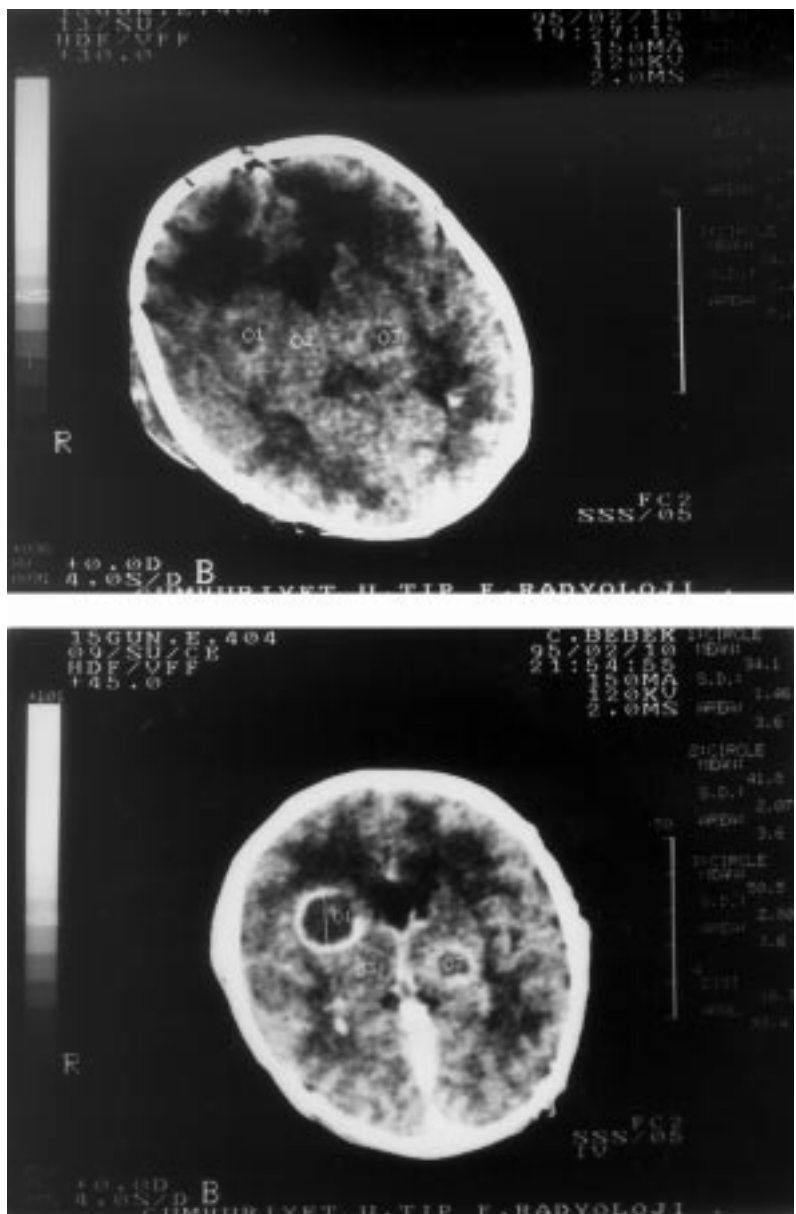


Figure 1. a, b Candida abscesses. a. Non-contrast CT scan showed poorly circumscribed hypodense lesions. b. After contrast administration, the lesions' contours enhanced and typical abscess formation was revealed.

treatment, are predispose factors for systemic candidiasis (2,3,6,7,9-12). In term neonates, most of the systemic candidal infections are associated with major congenital anomalies (5,6,9,11,12).

In this case, there is at present no explanation for candidal brain abscess such as neutropenia. However, prolonged broad-spectrum antibiotic usage may be accounted as a risk factor. Although candida vaginitis occurs with great frequency in pregnant women, maternal vaginal culture was negative in this case (5,7,9). The clinical features of systemic candidiasis in neonates are often non-specific, and indistinguishable from

bacterial sepsis (2,3,5,9,12). Systemic candida infections have high morbidity and mortality in neonates (4,7,9,10,13). The presence of hydrocephalus and ventriculitis are poor prognostic indicators in central nervous system involvement (2). Brain abscesses due to candida albicans usually has a poor prognosis and frequent neurologic disorders, but early and appropriate antifungal therapy provides good results without psychomotor and mental retardation as in our case (2,4,9). Traditional therapy of systemic candidiasis has been amphotericin B, sometimes combined with 5-fluorocytosine. The risk of renal toxicity, bone marrow suppression, anaphylactic reaction and electrolyte

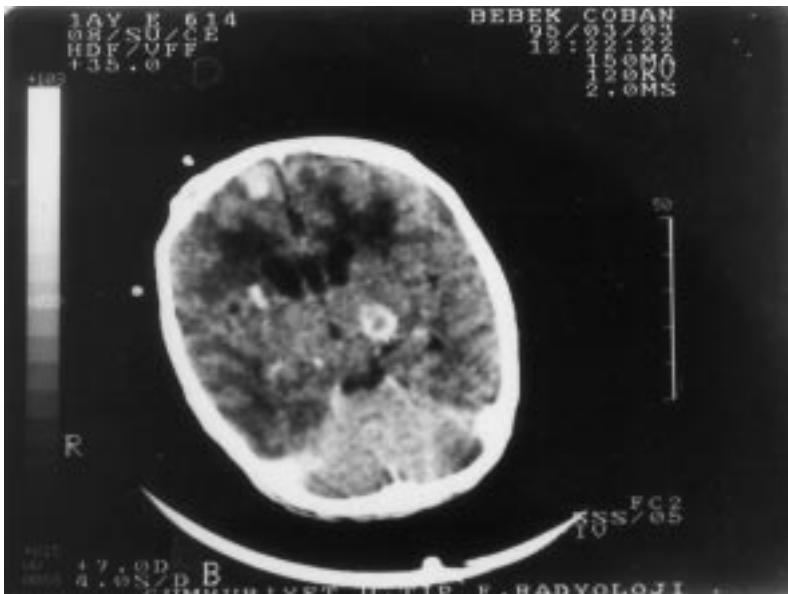


Figure 2. Candida abscesses, after aspiration of the right caudat nucleus located abscess and intravenous fluconazole treatment for 38 days. After contrast administration CT scan showed that the abscess were smaller in size and an enhancing nodul arised at right kfrontal lob.

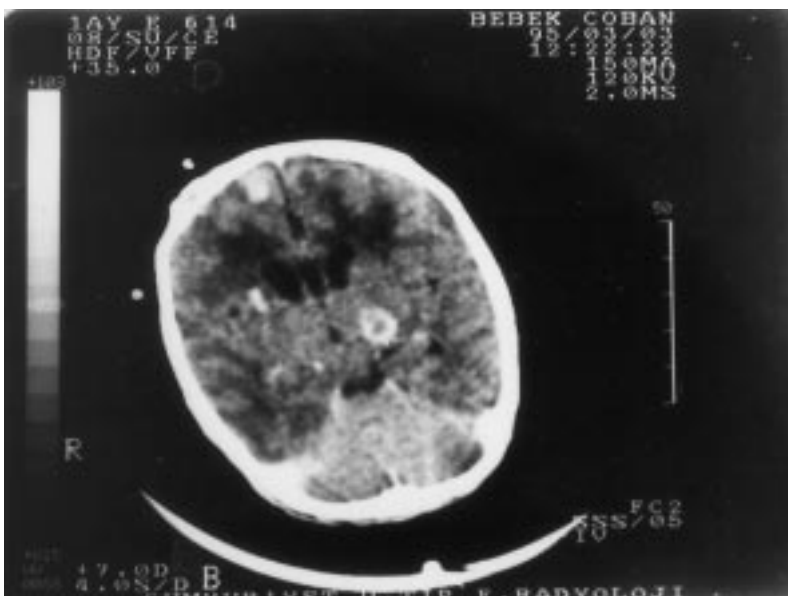


Figure 3. Candidal abscess after 56 days of intravenous and oral fluconazole treatment. After contrast administraiton, CT scan showed an area of encephalomalcia at right caudat nucleus. Abscess located at left capsula interna and enhancing nodular lesion were disappeared.

disturbances from this therapy increases the interest in an alternative drug. Fluconazole has been administered successfully both intravenously and orally with minimal side effects for the treatment of neonatal candidiasis (2,9).

CT findings of cerebral candidiasis show some similarity and differentiation from tuberculomas and pyogenic abscess. Cerebral candidiasis shows scattered hyperdens lesions with an enhancement pattern similar to tuberculoma. Although differentiation between cerebral candida abscess and cerebral tuberculosis is not always clear, diffuse multiplicity of the lesions favors the diagnosis of a fungal infection. Candida abscesses differ

somewhat from pyogenic abscesses in that the walls are thicker, less sharply defined and central density of the abscess is higher (5,8,11,14).

In conclusion, accurate diagnosis of cerebral candida abscess is difficult with laboratory tests and clinical findings. These patients must be evaluated extensively with CT, and microbiologic investigation should be made to the abscess material. CT is a valuable method for defining the size, extension, and characteristics of the lesions. Antifungal therapy should be administered to the patient immediately, because the outcome is poor in delayed cases.

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