



## Postmortem Disseminated Candidemia: A Case Report from a Tertiary Care Center

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### Abstract

*Candidiasis is a fungal infection most commonly caused by Candida albicans in very low birth weight neonates. The various presentations are disseminated candidiasis, fungal endocarditis and mucocutaneous involvement. A 26 week old extreme preterm female neonate presented with severe respiratory distress and abdominal distension and diagnosed as Necrotizing enterocolitis. Pericardial biopsy showed PAS positive hyphae colonies and budding yeast forms. Blood culture though not a sensitive indicator is reliable in undiscovered candidemia in the ante mortem period and reflected by pericardial biopsy in the post mortem period.*

**Keywords:** *Candida, disseminate, fungemia, post mortem, sepsis.*

### Introduction

Candidiasis is a fungal infection caused by the genus Candida, where Candida albicans (C.albicans) species account for 75% neonatal infections with very low birth weight (VLBW).<sup>(1)</sup> In the recent past, they have emerged as notable causative agents of neonatal infection. Although most of them manifest involvement of mucous membranes and skin, development of life-threatening candidemia or sepsis is possible.<sup>(2)</sup> Candida species are important opportunistic pathogens invading the bloodstream that metastasize to different organs also known as disseminated candidiasis. Blood culture in the ante-mortem period although not a sensitive indicator, is implied in sterile areas as

presence of candida in blood culture necessitates early empirical treatment. It is also necessary for removing them from central venous catheters as they are not regarded as “contaminants” in blood culture.<sup>(3)</sup> Colonization of candida in vagina of pregnant women is associated with preterm labour but it is rare for this group of organisms to cause antenatal fetal infections.<sup>(4)</sup> The extra cutaneous involvement is more common in lungs, heart and liver. Cardiac manifestations in neonates can be endocarditis, abscess around the valves, or intracardiac masses.<sup>(1)</sup> Over the past decade, Invasive candidiasis infection (ICI) has been increasing steadily in the neonatal period. Owing to the advances in technology in neonatal

care, the survival rate of premature infants has increased.<sup>(5)</sup>

### Case Report

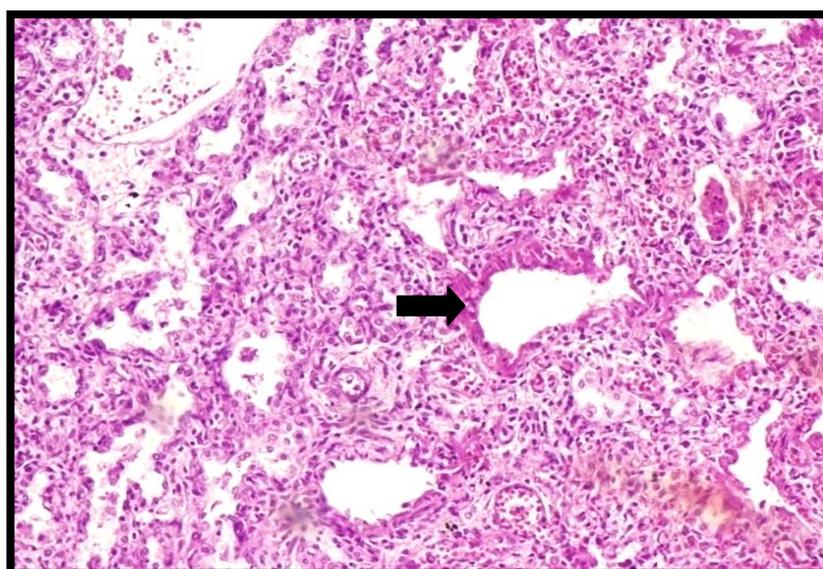
A 26 week old extreme preterm female neonate with extreme low birth weight of 605g was delivered to a 31year old primigravida by Emergency LSCS in view of severe eclampsia. Baby did not cry at birth with an APGAR score of 3/10 at 1 min and 5/10 at 5 min. She was mechanically ventilated and started empirically on Antibiotics. On day 6, the platelet count was  $40 \times 10^9/L$  and Total leukocyte count was increased. Chest X ray was done which showed severe Respiratory Distress Syndrome. In view of feed intolerance and abdominal distension, X-ray abdomen done was suggestive of Necrotizing enterocolitis. Following that baby developed severe metabolic acidosis with low bicarbonate which was corrected. On HFV mode of ventilation, baby was not maintaining vitals and had succumbed on Day 29 despite all resuscitative measures.

During autopsy, both macroscopic and microscopic features of immaturity were found. However, no morphologic signs of congenital malformations were noted on the neonate (Figure 1). The brain appeared congested with

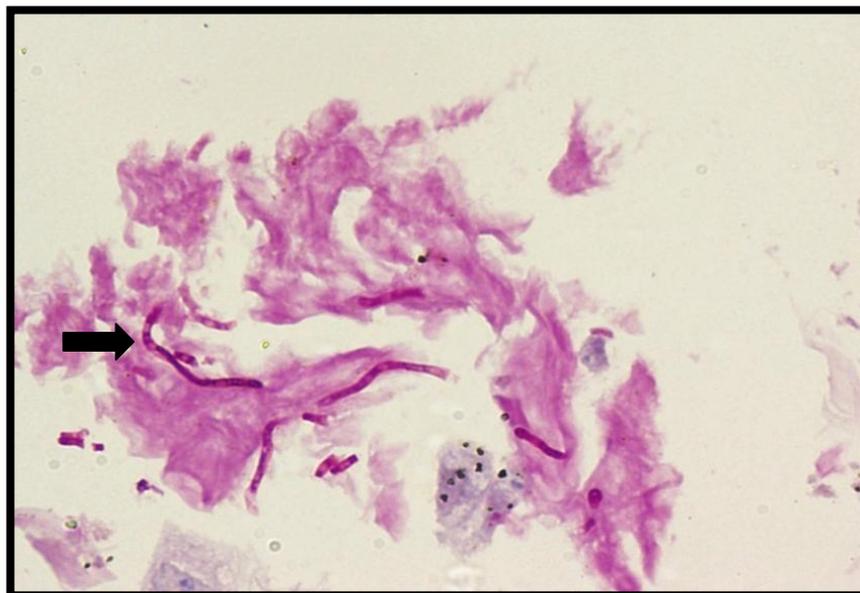
cerebellar hemorrhage. Both the lungs showed congestion with hemorrhagic areas and light microscopy showed features of hyaline membrane disease highlighted by PAS staining (Figure 2). Cut section of liver specimen revealed greenish discoloration of lung parenchyma with features of intrahepatic cholestasis. Pericardial biopsy showed PAS positive colonies of hyphae and budding forms of *Candida albicans* (Figure 3). All other organs were unremarkable and there were any features of necrotizing enterocolitis.



**Figure 1:** Gross, Extreme preterm neonate with very low birth weight



**Figure 2:** LM, PAS, 200x, Lung shows congestion with hemorrhagic areas and features of hyaline membrane disease (HMD)



**Figure 3:** LM, PAS, 400x, pericardial biopsy shows PAS positive colonies of hyphae and budding forms of *Candida albicans*

### Discussion

Disseminated candidiasis still remains a clinical diagnosis even in an era of powerful diagnostic tools. Fungal endocarditis is caused most commonly by *Candida* species which accounts to 87%, with infections that result from *Candida albicans* accounts to 42%. This case has some distinct features, presenting as pericardial candidiasis but also shares some similarities with the other studies. In premature infants, candidiasis accounts for 64% of cases and Aspergillosis for 21%.<sup>(6)</sup>

Congenital cutaneous candidiasis manifests at birth as erythematous maculo-papular rashes which may precede systemic involvement. Severe involvement of GIT and respiratory tract can occur following aspiration of infected amniotic fluid resulting in candidial septicemia.<sup>(7)</sup> The current incidence of Candidemia in neonates ranges from 1.6% to 4.5% over the past decade. Of this, 5% of cases progress to endocarditis which is predominant in preterm low birth weight neonates.<sup>(1)</sup> Premature neonates who are hospitalized in NICU are specifically prone to Candidiasis by *Candida albicans*. The possible susceptible factors are prolonged antibiotic therapy, corticoid therapy, intubation, intravenous catheterization and

parenteral nutrition.<sup>(5)</sup> The importance of determining the risk factors is to consider the time of initiating empiric antifungal therapy. It is proposed by Manzoni. P<sup>(9)</sup> that new onset severe thrombocytopenia of  $5 \times 10^9/L$  is seen in about 85% cases of fungemia in neonates with very low birth weight which persists for a mean period of 42 days as compared to this case which was  $40 \times 10^9/L$  on day 6. In about 3/4<sup>th</sup> of Gram negative bacteria infected cases and 1/2 of Gram positive cases, thrombocytopenia is an associated finding. Though this finding is seen commonly in ICI, organism specificity is disagreed by other studies.<sup>(8, 9)</sup> The other risk factors that are assessed separately or combined for determining the therapy are age at gestation, prophylactic one week exposure to 3<sup>rd</sup> generation cephalosporin, and fall in platelet count as similar to this case where the baby was treated with Sulbacef injection in view of Necrotizing enterocolitis, however no studies have been eventually studied to date.<sup>(10)</sup> Another feature of candidemia in neonates that can be diagnosed earlier in life is by carefully examining the umbilical cord and membranes which distinctly show yellow nodules and plaques with characteristic arrangement of necklace-like pattern. Hence it is very important

for the obstetricians and pediatricians to be familiarized with these findings.<sup>(11)</sup>

### Conclusion

Disseminated candidiasis can be determined by obtaining blood culture from heart at postmortem period or by ante mortem blood culture. This is not a sensitive indicator but a highly specific one to detect candidemia. To summarize, this case report signifies that candidemia in the postmortem period is likely a reliable indicator of undiscovered candidemia in the ante mortem period which may have contributed to the baby's demise

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