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LETTER

Rhino-orbital zygomycosis in a patient with pregnancy related liver disease and multi-organ failure

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Zygomycosis is an infection due to the fungi *Zygomycetes*, which, despite being ubiquitous, rarely cause disease in humans. Predisposing conditions include diabetic ketoacidosis, hematologic malignancies, iron overload, multi-organ failure, chronic liver disease, renal failure, metabolic acidosis and immunosuppressed state [1–3].

Zygomycosis can rarely occur in pregnancy as a complication of diabetic ketoacidosis [1]. We report zygomycosis occurring in a non-diabetic woman with pregnancy—related liver disease and multi-organ failure.

A 20-year-old woman presented to our center at 38 weeks of gestation (primigravida) with history of swelling of feet and fatigue for 10 days, breathlessness, and jaundice (3 days), and abdominal pain (1 day). She had no prior major illness. She had not taken any drug known to cause liver dysfunction. On presentation, she was conscious and oriented, her blood pressure was 140/90 mmHg, pulse rate was 124/min and respiratory rate was 36/min. She was icteric and pale. Abdominal examination showed a gravid uterus; there was no ascites or palpable mass. Urinalysis revealed proteinuria and pelvic ultrasound showed intrauterine death of the fetus. Her laboratory results were: hemoglobin 13 gm%, white cell count 12,800/cmm, platelet count 56,000/cmm, serum bilirubin 16.6 mg/dL, alanine transaminase 130 IU/L, creatinine 3.4 mg/dL, random blood sugar 160 mg/dL, lactate dehydrogenase 892 IU/L, and INR 4.2. Arterial blood gas analysis showed pH 7.2, lactate 7.3 mmol/L, anion gap 12.6 and, base excess −17.5. Etiological work up for liver dysfunction like peripheral smear for malaria and serology for hepatitis viruses (hepatitis A, B, C and E) was non-contributory. Her blood culture was sterile.

A diagnosis of pregnancy—related liver dysfunction [Diagnostic criteria for acute fatty liver of pregnancy (AFLP) and pre-eclamptic liver dysfunction and hemolysis, elevated liver enzymes and low platelets (HELLP) syndrome were met] with intra-uterine death was made. She was started on piperacillin with tazobactam and metronidazole intravenously. After a failed attempt to induce vaginal delivery, she underwent emergency cesarean section under blood product coverage 22 h after admission to our hospital. The baby delivered was a macerated stillbirth. There was 750 mL of ascites drained and 500 mL of blood loss during the surgery. She was maintained on the same antibiotics in intensive care unit and was on mechanical ventilation with other supportive measures. Hemodialysis was instituted, with which acidosis resolved partially (pH 7.35), but she had persistent lactic acidemia (lactate >4 mmol/L) with worsening liver functions and recurrent hypoglycemia.

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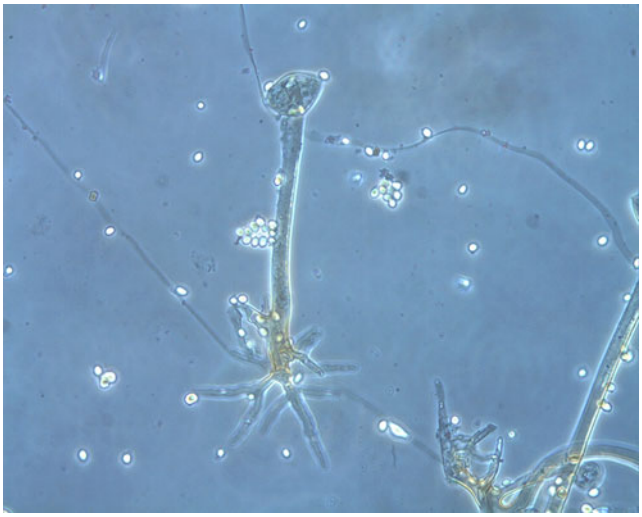

Fig. 1 Lactophenol-cotton blue stained preparation showing characteristic, short stalk, small sporangia and small spores of *Rhizopus microsporus*

Five days later, she developed swelling of left eye and conjunctival chemosis. Direct microscopy of tissue from the nasal cavity revealed broad aseptate hyphae. On culture, the isolate was identified as *Rhizopus microsporus* (Fig. 1). CT scan revealed infected paranasal sinuses and left orbit. She was started on intravenous liposomal amphotericin B and underwent emergency debridement of the infected paranasal sinuses with left orbital exenteration. However, she continued to worsen, had seizures and hypotension, and succumbed to the illness the next day.

AFLP, a disorder of mitochondrial fatty oxidation, though uncommon, is a significant cause of liver disease during pregnancy in India [4, 5]. Deaths from AFLP have declined at our centre with early recognition of this disease, immediate delivery and aggressive supportive measures [4]. Exact pathogenesis of AFLP is yet to be elucidated, but placental mitochondrial dysfunction maybe a driving factor [6]. Though liver biopsy is considered to be the gold standard for diagnosing AFLP, our patient was diagnosed based on the clinical 'Swansea criteria' [7]. She also met criteria for diagnosis of HELLP syndrome and pre-eclamptic liver dysfunction. This overlap of diagnostic criteria in pregnancy—related liver diseases is well recognized [8].

Persistent lactic acidosis, multi-organ failure, and broad spectrum antibiotics may have predisposed our patient to develop zygomycosis. Defective phagocytic function and decreased affinity of transferrin to iron may account for the predisposition of zygomycosis in metabolic acidosis [9], since iron is utilized by the organism for its growth.

Invasive zygomycosis has very poor prognosis and mortality remains high despite aggressive surgical and medical management [3, 10].

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