Hepatic & gastrointestinal basidiobolomycosis in11-year-old boy from Kirkuk in Iraq

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Summary:

A 11-year-old boy from Kirkuk in Iraq presented initially with acute abdomen due to gastrointestinal basidiobolomycosis that missed diagnosed as eosinophilic and crohns colitis to be presnted six months later with liver mass and died by hepatic basidiobolomycosis and liver failuer. **Introduction** *Basidiobolus ranarum* is a fungal infection that causes unusual chronic, skin infections and is increasingly being recognized as a causative agent of gastrointestinal basidiobolomycosis (GIB), especially in pediatric populations from tropical and subtropical regions . Basiobolus species are filamentous fungi that belong to the order Entomophthorales. *B. ranarum* was first described as an isolate from frogs in 1886. It was cultured from frogs' intestinal contents and excreta (Ribes et al., 2000). It is commonly found in soil and decaying vegetable matter. It is occasionally present as a commensal in the gastrointestinal (GI) tracts of amphibians, reptiles, fish and mammals such as frogs, toads, turtles, fish, chameleons, horses, dogs and bats (Kaufman et al., 1990; Zahari et al.,1990; Gugnani, 1999). The micro-organism was first isolated in 1955 from decaying plants in the United States. Subsequently it was found in soil and vegetation worldwide (Greer & Friedman, 1966). The first recognized human case of infection caused by Basidiobolus ranarum was reported from Indonesia as a subcutaneous infection in 1956.(Kian Joe L et al; 1956) Basidiobolus is endemic in Uganda and certain other areas of Africa, and in parts of Asia including India (Ribes et al., 2000). Unlike other fungi, *B. ranarum* can cause significant diseases, especially in immunocompetent hosts.[1] Saudi Arabia has the second highest overall reported GIB patient pool.[2] However, basidiobolomycosis is almost always misdiagnosed as other chronic granulomatous diseases, malignancies or inflammatory bowel diseases.[3] In the present report, we describe a case of Hepatic and GI basidiobolomycosis in a 11-year-old boy from Kirkuk in Iraq complicated by bowel perforation and acute liver failure.

Key words:
Hepatic & gastrointestinal basidiobolomycosis (GIB)

Case report:

A 11-year-old boy was presented on 12th of December 2017 with abdominal pain and fever that had started 3 days prior presentation. There was severe recurrent pain in the right iliac fossa and right upper quadrant . His past medical history was unremarkable. Abdominal examination revealed diffuse abdominal tenderness and rigidity in the right iliac fossa.Abdominal ultrasanography revealed a complex mass 10 by 4 cm along the ascending colon with multiple ascending and paraaortic LAP with mild ascites , the liver was normal , finding that confirmed by abdominal CT . Initial laboratory tests revealed peripheral blood eosinophilia 20% with neutrophile left shift leukocytosis with a white cell count of 17.8 mm^{-3} Hemoglobin concentration was 12.6 g $dl^{-1}$and platelet count was 587 000 mm^{-3}, with elevation in the erythrocyte sedimentation rate (ESR; 93 at 1 h) and Urinalysis,stool analysis, serum electrolytes, total proteins and albumin, biochemical liver function tests, blood urea nitrogen, serum creatinine as well as cultures from blood, urine and stool for bacteria and fungi, were normal or negative. Surgical exploration was done on 13th of December and revealed thickened ascending colon wall at the mid part with multiple adjacent mesenteric lymph nodes largest 2.5 cm type of Resection done and histopathology suggested eosinophilic typhilitis and colitis with reactive follicular hyperplasia and slide review in another lab suggested crohns colitis. The patient received different lines of treatments with no benefit . MRI of the abdomen on 7th of March with evidence of large lobulated heterogeneous mass in the right lobe involving segment 5 & 6 measuring 8 by 7 by 7cm , well circumscribed but poorly encapsulated with predominantly low T1 and high T2 signal , multiple internal septations with necrotic cystic changes and mild fat content and bone

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marrow on 10th March 2018 revealed cellular marrow with slight myeloid hyperplasia and predominance of eosinophil precursors . The patient general condition deteriorated, and presented to us on 23rd of April with high-grade fever of 39 uC, toxic appearance, increasing leukocyte count (18 600mm^{-3}), marked neutrophilia (58.6%), eosinophilia (21 %), thrombocytosis (705 000 mm^{-3}) and falling hemoglobin (8.4 g dl^{-1}); ESR reached 96 at 1 h, and CT guided biopsy revealed non-specific inflammatory lesion of the liver . After discussing with radiologist the patient referred to the surgeon for exisional biopsy on emergency base whom gave the patient a course of steroid on clinical diagnosis of eosinophilic enteritis but the patient did not improve. Type of surgery operator procedure done on 23rd of May and histopathology revealed helmenthic infestation and the albendazole was prescribed by the surgeon with no benefit and slide review of the present and previous surgery on 6th of June revealed eosinophilic absess with fungal organisms consistent with hepatic and gastrointestinal basidiobolomycosis. Antifungal itraconazole tr 4 mg kg^{-1} day^{-1} divided into twice-daily doses for 2 days followed by 3 to 5 mg kg^{-1} day^{-1} twice a day . Unfortunately the patient did not respond and developed massive upper GIT bleeding with endoscopic finding of extensive esophageal , gastric and duodenal ulceration and ultrasonic finding of diffuse dilatation of the intrahepatic bile ducts then passed into hepatic coma and died on 13th of June with parameters of acute liver failure .

Discussion:

Basidiobolus ranarum is a fungal infection that has been classified as *Zygomycota* (*Entomophthorales*) and causes unusual chronic skin infections.[1] Currently, this fungus is increasingly being recognized as a causative agent of gastrointestinal basidiobolomycosis (GIB), especially in pediatric populations from tropical and subtropical regions. Unlike other fungi, *B. ranarum* can cause significant diseases, primarily in immunocompetent hosts. A review by Vikram *et al.* reported that the worldwide occurrence of GIB cases between 1964 and 2010 was 44 cases, with 19 from the USA.[4] To date, there are approximately 28 case reports of pediatric GIB, with the majority being from Saudi Arabia (19 cases). [4] Others have been reported from Iran, Iraq, Brazil, Nigeria and Oman.[2]Almost all cases of basidiobolomycosis were misdiagnosed as other chronic granulomatous diseases, malignancies or inflammatory bowel diseases.[3] Clinical presentations can vary from abdominal mass and fever with eosinophilia to severe bowel ischemia, necrosis and shock. Severe forms of basidiobolomycosis, as in our patient, are rarely reported as liver failure.

The reported liver masses caused by basidiobolomycosis have always been part of a disseminated disease . [5-8] Most cases, when first admitted to the hospital as acase of acute abdomen. The diagnostic procedures to obtain tissue and either histopathology or culture will lead to a correct diagnosis . The main reason for this bad outcome is absence of the experience of our histopathlogist that lead to profound delay in the diagnosis for more than 6 months from 13th December 2017 till 6th of June 2018 this is vital as delaying a correct diagnosis could be fatal especially in pediatric patients.[9][10] A high index of suspicion is crucial, and diagnosis of basidiobolomycosis should be added to the differential diagnosis of an abdominal mass with eosinophilia. The gold standard for the diagnosis is culture, but histopathology is almost equivalent to the culture when the typical features of *B. ranarum*are present.[11] El-Shabrawi *et al.* described a molecular method of DNA sequencing using an 18sRNA for diagnosis of *Basidiobolus*, which can precisely confirm the diagnosis from tissue specimens.[2] Specific therapy is usually started once the diagnosis has been confirmed. Until recently, a trend toward the early surgical resection of fungal mass has been a cornerstone in managing basidiobolomycosis.[4] Some centers even adopted a philosophy of the early surgical intervention in patients with GIB who presented with inflammatory masses to minimize morbidity and mortality,[12] although many reports show that antifungal therapy alone is sufficient in treating such a cases.[13] Combination antifungal therapy has been used with amphotericin-B and itraconazole, although the failure rate with amphotericin-B has been documented in many reports.[4][14] Itraconazole has been considered the drug of a choice,[4] but some reports from tissue biopsy have demonstrated some resistance to itraconazole and because of it is side effects, some interest in using the second-generation azoles (voriconazole) to replace itraconazole in management of GIB has occurred. Many reports showed successful treatment of GIB with voriconazole alone without surgical resection. Posaconazole also has been tried for treatment of GIB with successful results.[15][16]

Conclusion:

The diagnosis of basidiobolomycosis should be added to the differential diagnosis of an abdominal or hepatic mass with eosinophilia. Basidiobolomycosis has a good prognosis based on the available data. Most of the mortalities are attributable to younger age groups, delays in diagnosis and initiation of appropriate antifungal therapy as well as complications of this illness.

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