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Gastrointestinal basidiobolomycosis

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ABSTRACT

We are reporting three cases of gastrointestinal basidiobolomycosis from Tohama (the southern region of Saudi Arabia) during the period from September 2016 to September 2017. Although the cases had different pathological sites and clinical presentations, all were treated successfully with a single oral antifungal therapy (Itraconazole) with no need for surgical excision. The course after treatment was uneventful with complete cure and no relapses.

1. Introduction

Basidiobolus Ranarum is a fungal infection that causes unusual gastrointestinal basidiobolomycosis (GIB), especially in the pediatric populations from tropical and subtropical regions. Basidiobolus Ranarum, unlike other fungi, can cause significant disease in the immune-competent hosts. Of all the pediatric GIB cases reported, almost 70% were from Saudi Arabia [1,2]. Saudi Arabia has the second highest overall reported GIB patient pool [3]. Some researchers stated that the treatment of GIB should include combined medical and surgical management.(2) We are reporting three cases of GIB treated successfully with Itraconazole alone without surgical intervention.

2. Cases description

2.1. Case 1

A six years old Saudi girl, from Tohama (southern region of Saudi Arabia) presented with acute painful rectal bleeding with two months history of abdominal pain, diarrhea and anorexia associated with weight loss. On abdominal examination, the abdomen was soft and lax, no tenderness, no palpable mass. On rectal digital examination, a tender swelling with induration was felt all-around with narrowing of the lumen of the anal canal and rectum and fresh blood. Laboratory tests revealed microcytic hypochromic anemia (HB 9.3 g/dl), leukocytosis and eosinophilia (WBC 17.7 10^9/L, eosinophil 27.7%) with absolute eosinophilia, (4.9 10^9/L), platelets (680 10^9/L), CRP (65.3 mg/L), ESR in the first hour 23 mm/hr. The patient was admitted for further investigations to exclude rectal tumor. MRI pelvis (Fig. 1a) showed diffuse marked thickening of the rectal wall, anal canal wall, edema of the peri-rectal fascia and lymphadenopathy. An incisional rectal biopsy was taken which revealed prominent eosinophilic infiltrate with focal partial necrosis and surrounding reaction attempting necrotizing granuloma formation with multinucleated giant cells. The presence of focal spectate hyphae surrounded with eosinophilic cuff (Splendore-Hoeppli phenomenon) was diagnostic for GIB (Fig. 1b). A Full therapeutic course of oral Itraconazole was started for 11 months. The Patient showed significant clinical improvement with normalization of the laboratory parameters. MRI follow up (Fig. 1c) revealed a significant regressive course regarding the extent and severity of the previously noted thickening of the anal canal and rectal walls. The peri-rectal fascial edema resolved with disappeance of the lymph nodes. Patient was put on regular follow up both clinical and radiological every 6 months with no manifestations of relapse.

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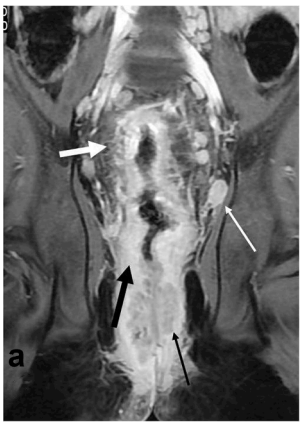

Fig. 1a. MRI Coronal T1 post-contrast at initial presentation showing diffuse marked thickening of the rectal wall (Thick black arrow), anal canal wall (Thin black arrow) with peri-rectal fascia thickening and edema (Thick white arrow) and associated surrounding lymphadenopathy (thin white arrow).

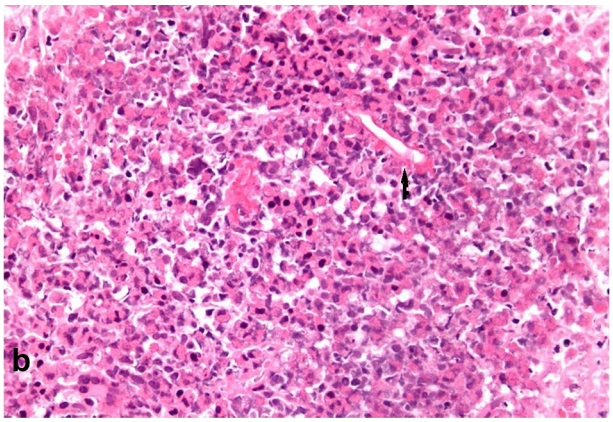

Fig. 1b. Periodic acid–Schiff staining shows broad fungal hyphae and zygospores surrounded by the oesiophilic cuff (the black arrow).

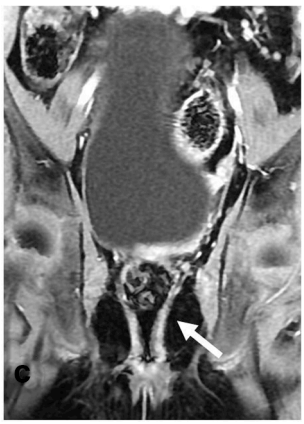

Fig. 1c. MRI Coronal T1 post-contrast after medication showing almost normal appearance of the rectum and anal canal.

2.2. Case 2

A four years old Saudi girl, from Tohama, presented by chronic abdominal pain associated with anorexia, infrequent bloody diarrhea and weight loss. Abdomen was soft and lax, no organomegaly, bilateral enlarged inguinal lymph nodes with no other lymphadenopathy. Digital rectal examination showed a palpable firm rectal mass involving the whole circumference with narrow lumen and bleeding on touch. Laboratory finding showed microcytic hypochromic anemia HB (10.9 g/dl), leukocytosis (WBC 19 10^9/L), eosinophilia (14.8%) with absolute eosinophilic count of 2.8 10^9/L. platelets count (330 10^9/L) and CRP (5.3 mg/L). CT abdomen (Fig. 2a) showed ill-defined circumferential enhancing soft tissue mural thickening of the anal canal and rectum with stranding, edema of peri-rectal fat and enlarged pelvic lymph nodes. Incisional biopsy was taken and the diagnosis of GIB was confirmed. Oral Itraconazole was started for 8 months with dramatic improvement in the patient condition. CT Follow up (Fig. 2b) showed complete regression with no relapse.

2.3. Case 3

A six years old Saudi boy, from Tohama. He presented with recent onset of acute generalized abdominal pain associated with constipation and fever for 2 weeks duration. Abdominal examination revealed localized tenderness and rebound tenderness in the right iliac fossa. The patient was admitted as a case of complicated acute appendicitis for further investigations. Laboratory tests revealed microcytic hypochromic anemia (Hb 11.1 g/dl), thrombocytosis (847 10^9/L), leukocytosis (WBC 30.79 10^9/L), eosinophilia (20.0%) with absolute eosinophilic count (6.1 10^9/L) and high inflammatory markers CRP 158 mg/L, ESR 22 at 1 h. CT abdomen (Fig. 3a) showed multiple colonic, skip lesions in the form of circumferential wall thickening involving the cecum, ascending colon and transverse colon (Fig. 3b) with para-colic fluid collections and mesenteric lymphadenopathy. These findings were suggestive of granulomatous infection of the colon, possibly fungus versus intestinal lymphoma. CT guided biopsy was taken. Histopathology showed chronic granulomatous inflammation with scattered thin wall broad fungal hyphae with eosinophilic infiltrate. These points toward GIB. A course of oral Itraconazole was started for 8 months with marked improvement in the patient's condi-

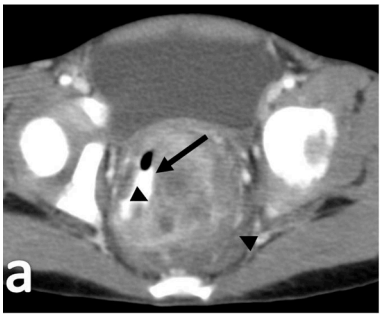

Fig. 2a. Axial CT (before treatment) with rectal and IV contrast revealed marked asymmetric thickening of the rectal wall (Black arrow head) and significant lumen narrowing (Black arrow).

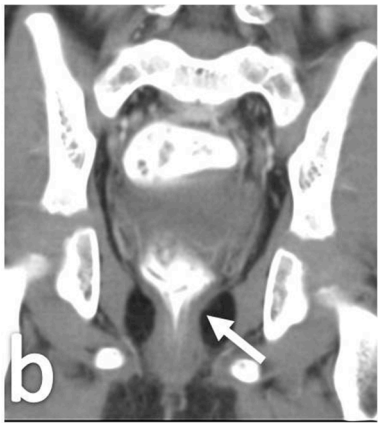

Fig. 2b. CT after treatment revealed normal appearance of the rectum.

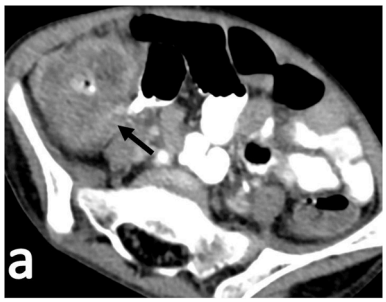

Fig. 3a. Axial CT shows marked wall thickening affecting the Caecum (black arrow) and ascending colon with marked lumen narrowing.

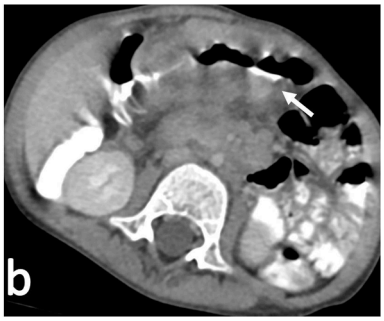

Fig. 3b. CT shows thickening of the wall of transverse colon (white arrow).

tion. Radiological Follow up showed complete disappearance of the colonic lesions with no relapse.

3. Discussion

Basidiobolus Ranarum is a known cause of chronic subcutaneous zygomycosis. During the past decade, many cases have been reported with extra-cutaneous basidiobolomycosis. GIB is a rare but emerging fungal infection causing serious, and occasionally fatal, pediatrics disease [2,4]. A review by Vikramet and his colleagues reported that the worldwide occurrence of GIB cases between 1964 and 2010 was 44 cases, with 19 from the USA [3]. The other large pool of cases (18 cases) was reported in a multicentric study from Saudi Arabia by Shreef et al., in 2018 [2]. Many authors observed that most of GIB cases were from the southern region of Saudi Arabia, a region that has warm and humid climate which might enhance the growth of the fungus with subsequent environmental contamination. Although the portal of entry of the fungus into the host is unknown, the involvement of the intestine in all cases indicates route of infection is due to ingestion of contaminated food from infected soil [2,4]. Similarly, our cases were from the same endemic region (the Southern region of Saudi Arabia).

GIB infection usually mimics other conditions such as intestinal lymphoma and inflammatory bowel disease, for example, Crohn's disease or ulcerative colitis, intestinal tuberculosis, sarcoidosis, schistosomal granuloma, and amoebiasis, and thus it may be misdiagnosed. Because of the nonspecific signs and symptoms of this disease, the diagnosis has sometimes been delayed, with increased morbidity. The diagnosis of GIB depends on a high index of suspicion, so that knowing the areas with higher incidence of GIB will be of great help in the early diagnosis of this rare disease [2,4,5]. Additionally, GIB should be born in mind in cases that have abdominal symptoms (pain, bowel habit changes, bleeding per rectum) associated with abdominal mass and eosinophilia especially in an endemic region [2,6].

We observed that all our patients had the same presentations (fever, abdominal mass, abdominal pain, changes in bowel habits, anorexia and loss of weight with or without bleeding per rectum). All had the same laboratory abnormalities (leukocytosis with very striking eosinophilia and anemia). These observations were of great help to reach to an early diagnosis. Also higher degree of awareness among our hospital staff (clinicians, radiologists and histopathologists) about this rare disease helped us to avoid an incorrect, late diagnosis and thus prevented unnecessary surgical interventions.

The gold standard for the diagnosis of GIB is tissue culture, but histopathology is almost equivalent to the culture when the typical features of Basidibolus Ranarum are present (chronic granulomas rich in eosinophils and the Splendore–Hoeppli phenomenon). El-Shabrawi et al., 2014 described a molecular method of DNA sequencing using an 18sRNA for diagnosis of Basidiobolus Ranrum, which can precisely confirm the diagnosis from equivocal tissue specimens [1].

On the one hand, Some centers adopted the protocol of the early surgical intervention in patients with GIB who presented with inflammatory masses in order to get an excisional biopsy, to confirm the diagnosis, and to completely remove the pathology and hence prevent the recurrence and minimize the duration and side effects of antifungal drugs [2,3,7]. In our patients the application of this philosophy was difficult and dangerous because 2 of our patients had lesions involved the rectum and anal canal and in the 3rd patient the pathology involved most of the colon. As a result, the surgical excision considered to be risky and mutilating. On the other hand, many reports showed that antifungal therapy alone is sufficient in treating GIB cases [3,6]. Additionally, in our cases, obtaining of the tissue specimens without resection for histopathology to diagnose GIB was possible with proper final diagnosis. In view of all the above, the decision was taken to start the medical treatment alone without surgical resection and to monitor the patient response both clinical and radiological.

Itraconazole has been considered the 1st drug of choice in the treatment of GIB. However some reports demonstrated some resistance to Itraconazole and its side effects consequently, others were interested in using the second-generation azoles (Voriconazole) to replace Itraconazole in the management of GIB [8]. Some authors concluded that a single antifungal drug is as effective as combined antifungal therapy and surgery with less complications and side effect [6,7]. In our case series, the use of oral Itraconazole (5mg/kg twice a day) as a monotherapy without surgical excision of the whole lesion showed complete cure of all cases without relapse. Itraconazole therapy was followed by dramatic improvement of symptoms and signs along with a decrease of eosinophils within 10 days of treatment with no reported side effects. The treatment was continued until the CT follow up showed complete disappearance of the lesions, the mean duration of treatment was 7.3 months. We believe that the reason of these excellent results is due to early suspicion of GIB, early diagnosis and treatment.

In conclusion, we emphasize that the diagnosis of GIB needs a high index of suspicious and we highly recommend its inclusion in the differential diagnosis of any abdominal mass that is associated with fever and rectal bleeding, eosinophilia and anemia. A single antifungal therapy in cases where the surgical resection is impossible or mutilating is very effective in complete elimination of GIB provided that the diagnosis and treatment is started in the early course of the illness.

Patient consent

Consent to publish the case report was not obtained. This report does not contain any personal information that could lead to the identification of the patient."

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Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

Declaration of competing interest

"The following authors have no financial disclosures: (Authors initials)."Khalid Shreef, Maged Shoukeer, Ahmed Albishry, Hamad Hader, Mohmmed H. Mazhar Ashour, Hatem Alsherbiny, Eman Ghazwani, Kholood Alkedassys A.

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References

[1] El-Shabrawi MH, Kamal NM, Kaerger K, Voigt K. Diagnosis of gastrointestinal basidiobolomycosis: a mini review. Mycoses 2014;57:138–43.
[2] Shreef K, Saleem M, Saeedd MA, Eissa M. Gastrointestinal basidiobolomycosis (GIB): an emerging confusing disease in children. (Multiple.centers experience). European journal surgery. Eur J Pediatr Surg 2018;2:194–9.
[3] Vikram HR, Smilack JD, Leighton JA, Crowell MD, De Petris G. Emergence of Gastrointestinal Basidiobolomycosis in the United States, with a review of worldwide cases. Clin Infect Dis 2012;54:1685–91.
[4] El-Shabrawi MH, Kamal NM. Gastrointestinal Basidiobolomycosis in Children: an overlooked emerging infection?. J Med Microbiol 2011;60:871–80.
[5] AlJarie A, AlMohsen I, AlJumaah S, AlHazmi M, AlZaml F, AlZahrani M, et al. Pediatric gastrointestinal basidiobolomycosis. Pediatr Infect Dis J 2003;22:1007–13.
[6] Al-Juaid A, Al-Rezqi A, Almansouri W, Maghrabi H, Satti M. Pediatric gastrointestinal basidiobolomycosis: case report and review of literature. Saudi J Med Med Sci 2017;5:167–71.
[7] Al-Shanafey S, AlRobean F, Bin Hussain I. Surgical management of gastrointestinal basidiobolomycosis in pediatric patients. J Pediatr Surg 2012;47:949–51.
[8] Albaradi BA, Babiker AM, AlQahtani HS. Successful treatment of gastrointestinal basidiobolomycosis with voriconazole without surgical intervention. J Trop Pediatr 2014;60:476–9.