International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2020): 7.803

Pediatric Basidiobolomycosis Case Reports in Makkah - Saudi Arabia

Hana S. Halabi[1], Asad H. Toonsi[2], Nimah J. Dhafar[3], Mohammad I. Qashgry[4], Khairiyah K. Alkafiyah[5], Hussain A. Alkhairy[6], Ahmed Abouissa[7]

[1] Pediatric Gastrointestinal Diseases Department, Maternity and Children Hospital, Makkah, Saudi Arabia

[2, 6] Pediatric Infectious Diseases Department, Maternity and Children Hospital, Makkah, Saudi Arabia

[3, 4] Department of Medicine, Umm Alqura University, Makkah, Saudi Arabia

[5] Pediatric Department, Maternity and Children Hospital, Makkah, Saudi Arabia

[7]Diagnostic and Interventional Radiology, Alnoor Hospital, Makkah, Saudi Arabia

1. Introduction

Basidiobolomycosis is a rare disease caused by a fungus named *Basidiobolus ranarum*; an environmental saprophyte belongs to the Entomophthoraceae family of the Zygomycetes class.It is usually found in frogs, soil, decaying vegetables, and the gastrointestinal tracts of amphibians, reptiles, insects, bats, horses, and dogs. Patients with B. ranarum infection present with subcutaneousfat tissue infection involving the limbs, trunk or buttocks, gastrointestinal, retroperitoneal, or systemic lesions. It is mostly acquired after minor trauma to the skin or after insect bites.

Most cases have been reported endemically in tropical and subtropical regions of Africa, South America, and Asia.

A combination of surgery and antifungal medications cured almost all of the previously reported worldwide cases. Our case reports are on 3 Saudi children with Intestinal Basidiobolomycosis treated successfully with antifungal medication alone without surgical intervention[1,2].

2. Case 1

An 11-year-old boy who is known to have diabetes mellitus type 1 “DM” on insulin presentedto Maternity and children’s hospital in Makkah in 2017 with bloody diarrhea for one month, his complains started suddenly, continuous and related to every food intake three to four times per day, it was bloody, small in the amount associated with tenesmus, on and off abdominal pain and not improving, he also started to develop loss of appetite and vomiting for two weeks.

He had fever, night sweats, and other systemic review was unremarkable.

He denied contacting with sick patients, animals, or raw milk ingestion. His vaccines were up to date.

His family history was negative for gastrointestinal diseases, positive for DM, and positive consanguinity.

On examination, vital signs were within normal ranges. He had pallor in the conjunctiva, and his abdomen was soft and lax with no tenderness or organomegaly. A rectal examination was not performed.

His white blood cell count was 19.97, eosinophils 3.95 (19.8%), neutrophils 11.91 (59.5%), monocytes 1.35 (6.8%), platelet count was 685, C- reactive protein was 1.84,ESR was 14,liver and kidney function tests were unremarkable. His stool analysis revealed positive blood and pus.

Abdominal ultrasound showed right iliac fossa mild to moderate amount of free fluid with echogenic mesentery associated with dilated thickened slightly fixed large bowel wall measures about 15mm with multiple enlarged mesenteric lymph nodes.

CT abdomen with contrast showed circumferential thickening of the rectum, sigmoid colon, their walls showed enhancement post-contrast, and some regional and mesenteric lymph node enlargement (Fig. 3).

Colonoscopy was performed and showed fungating ulcerating masses in the descending colon with early signs of bleeding.

Biopsy and histopathology were performed, descending colon biopsy showed colonic-type mucosa with ulceration, chronic granulomatous inflammation mainly eosinophils and special stain for fungi (PAS) showed positive fungal spores and Splendore-Hoeppli phenomenon consistent with basidiobolomycosis (Fig. 1,2), gastric and esophageal biopsies were performed but not significant.

The patient was diagnosed with basidiobolomycosis and was treated by intravenous voriconazole for two weeksand the general condition of the patient improved, then he was discharged and continued oral voriconazole 200mg twice daily for one year with a close out-patient clinic follow up every 6 months, there was a marked improvement in his condition since the first follow up appointment, there was no abdominal pain, diarrhea, or vomiting, and his blood workup, abdominal ultrasound, CT scan of the abdomen with contrast showed marked improvement comparing to his

initial investigations. After 2 years of follow up, the patient was in a well condition and basidiobolomycosis subsided.

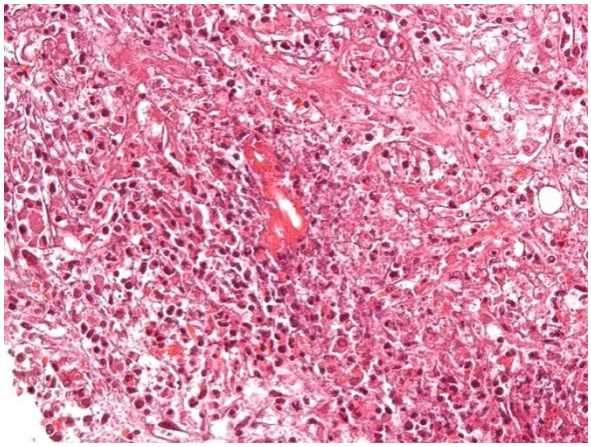


Figure 1: Colonic-type mucosa with ulceration, chronic granulomatous inflammation mainly eosinophils shown by H&E stain

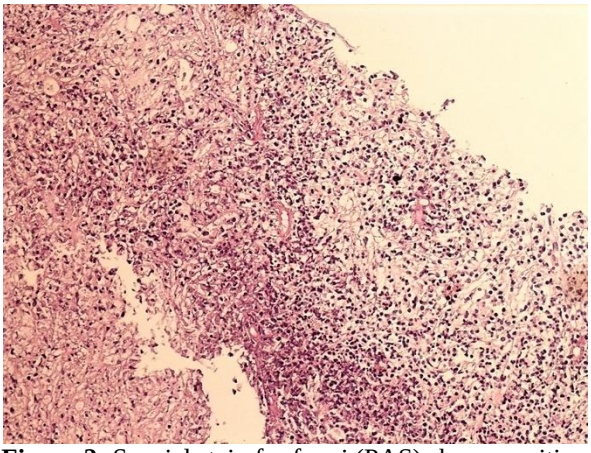
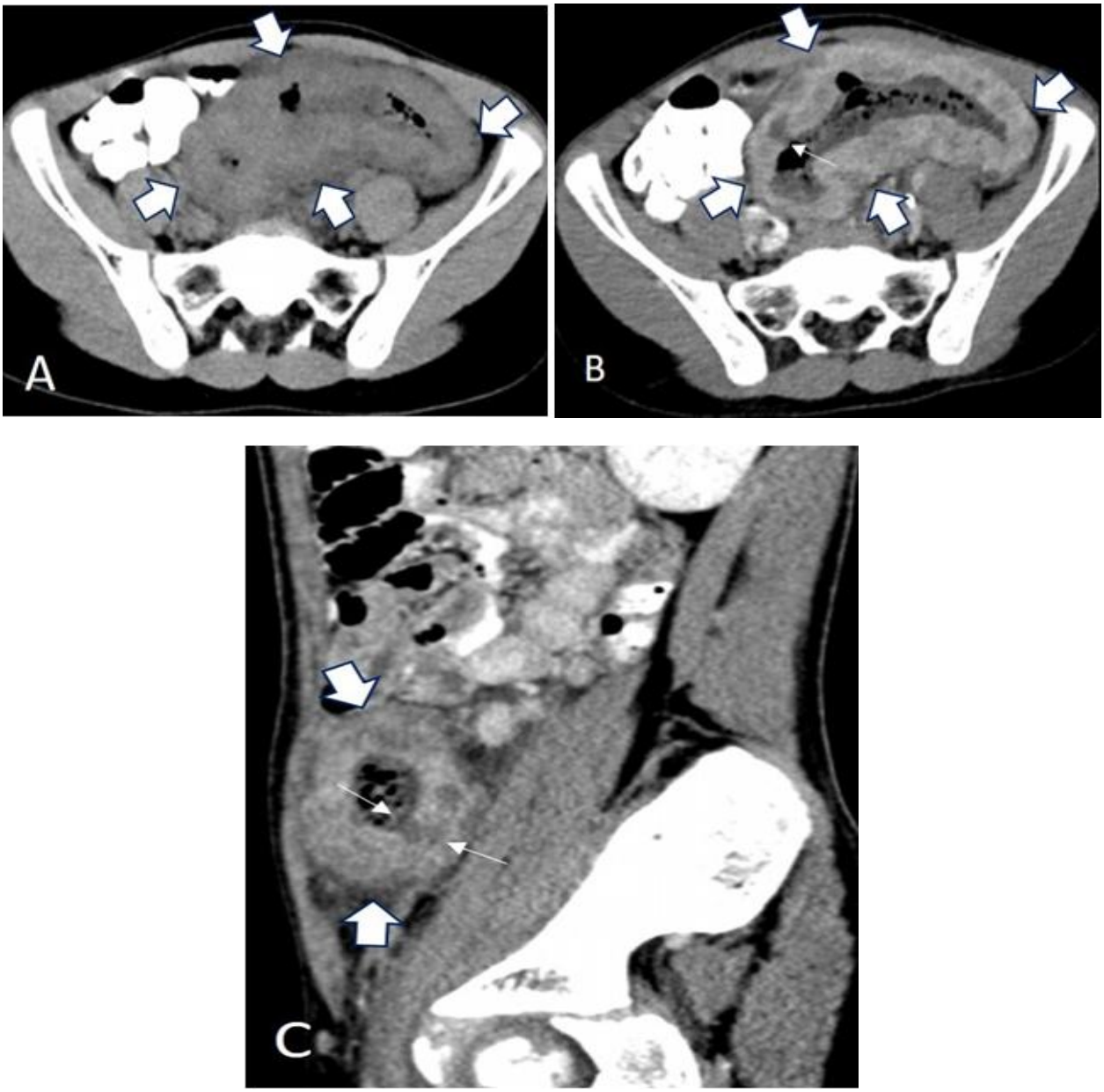


Figure 2: Special stain for fungi (PAS) shows positive fungal spores and Splendore-Hoeppli phenomenon consistent with basidiobolomycosis.



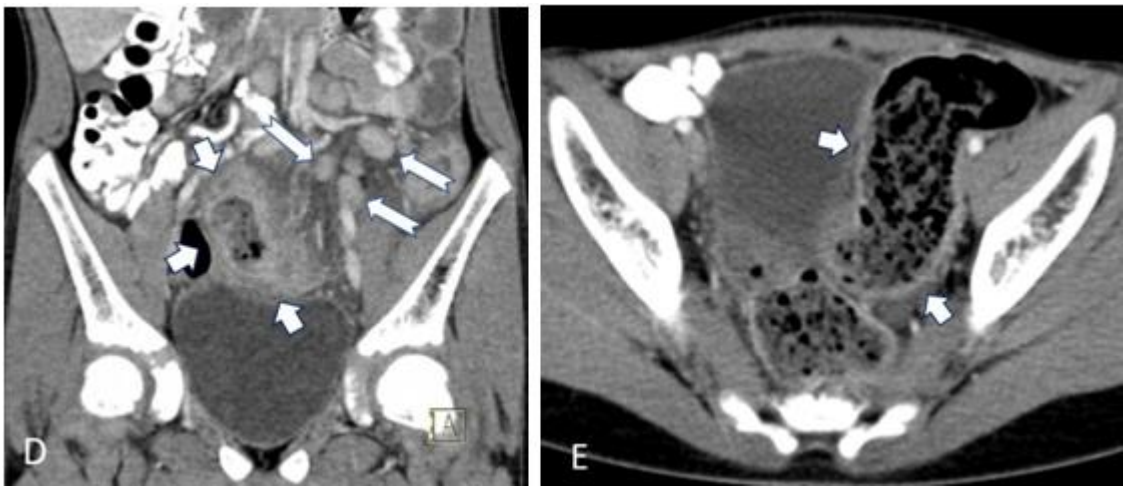


Figure 3: CT scan after oral, rectal and IV contrast

Selected axial (A&B), Sagittal (C) and Coronal (D) reformatted images show dilated sigmoid colon with circumferential wall thickening (block arrows). The colonic walls have heterogeneous relative high density on non-enhanced images (A) and heterogenous mural enhancement in post contrast scan (B), mucosal defects (thin white arrows in B&C with intra-mural non-enhancing focal lesions are noted that represent ulceration and probably intra-mural abscesses/necrosis. Large non cavitating, non-coalescent mesenteric lymph nodes are noted in D (notched arrows). (E) Follow up CT scan shows complete resolving of the sigmoid colon lesion with restoration of normal wall thickness.

Case 2

A 6-year-old boy referred to Maternity and children hospital from Qunfutha in 2016 with a history of bloody diarrhea for four months and became more frequent in the last 1.5 months. His complaint is associated with abdominal pain in the left and right hypochondrial area, on and off fever, loss of weight, and multiple admissions for the same presentation.

His Family history was positive for inflammatory bowel disease, hismaternal grandmotherhad colon cancer.

On examination, his temp. was 39°C, other vitals were normal, conscious and alert, his abdomen was soft and with mild left lower quadrant tenderness.

CBC showed Neutrophils 30.6%, eosinophils 32.9% with a count of 2.49, hematocrit 32, mean corpuscular volume 68.1, mean corpuscular hemoglobin 21.7. Liver and renal function tests were unsignificant.

The peripheral blood smear showed prominent monocytes, neutrophils showed toxic granulation and vacuolation with occasional primitive ones, eosinophils were also prominent. Some large granular lymphocytes were seen; RBCs showed anisocytosis with some schistocytes and some target cells. Some giant platelets are seen. ESR was 46 in 1 hour, 86 in 2 hours, CRP positive.

Stool analysis, stool was positive for occult blood, and stool color was reddish, watery in consistency, pus cells +3, organisms +2, mucous +1.

Abdominal CT with contrast was done and showed multiple para-aortic lymph nodes, increased mural thickening, and a mass was seen in sigmoid colon 3 x 4cm.

Colonoscopy was performed and revealed a large fungating mass size 5 x 5cm in the rectosigmoid area covered with necrotic tissue.

Histopathology of the mass showed colonic type tissue with ulcerative and chronic inflammation with abscess formation and necrosis with an area of splinder-hipploe phenomena consistent with fungal infection.

The patient was diagnosed as basidiobolomycosis in the rectosigmoid area and was treated with oral voriconazole 200mg once daily for one year with a close out-patient clinic follow up every 6 months. In his follow up appointments the patient was in a generally well condition, there was no fever, abdominal pain or bloody diarrhea, his symptoms kept improving, his labs (CBC, ESR) and ultrasound of the abdomen were normal, colonoscopy was not done, After two and a half years of follow up, the patient was in a good condition and basidiobolomycosis subsided.

Case 3:

2 year old girl case of mild bronchial asthma on Inhaled Salbutamol PRN with recurrent otitis media. Presented with history of fever 1 month and diarrhea with abdominal pain and abdominal swelling for 2 weeks. Patient was in normal health condition until 1 month back when she started to have continuous fever, responding to paracetamol.

Associated with diarrhea sometimes watery and other semi solid,moderate in amount, 3-4 times per day,yellow in color, occasionally bloody.

In the last 2 weeks' patient started to have abdominal pain in right side of abdomen that increase after any food she ate, with abdominal swelling according to mother can not record it increase with time or not.There was history of decreased

oral intake and activity. She also had weight loss. No history of vomiting, Positive history of pus discharge from left ear since she was 5-month old that responded to antibiotics and it was recurrent.

No history of contact with sick people or raw milk ingestion, no history of contact with animals.

No family history of malignancy or inflammatory bowel disease.

3. On examination

Was conscious, Alert, looking ill,pale,vital signs were normal, Growth parameters within normal, no oral ulcer no lymphadenopathy, Abdomen was distended with tender hard mass palpable in RT side of abdomen around 10 x 20cm rounded edge with no skin discoloration or redness or hotness .no organomegaly, other systemic examination was unremarkable.

CBC showed: leucocytosis WBC 40, 32 showing marked neutrophils: 82 %, Eosinophils: 3.6 % , mono : 5% ,hypochromic microcytic anaemia with high platelet count 1132.

ESR = 55, CRP= 29, LDH =277 albumen was = 23.
her Renal profile, bone profile, hepatic profile and coagulation profile were normal.

Peripheral blood film: Moderate leucocytosis with neutrophilia, neutrophils showed toxic granules and vacuoles, eosinophilis were increased with high thrombocytosis, some target and elliptocytis with few fragmented RBC.

The stool tested positive for occult blood, pus cells + 3, RBC +2, microorganism +2, stool culture was negative for enteric pathogens. The RAST specific IgE test for common Food allergens was negative.

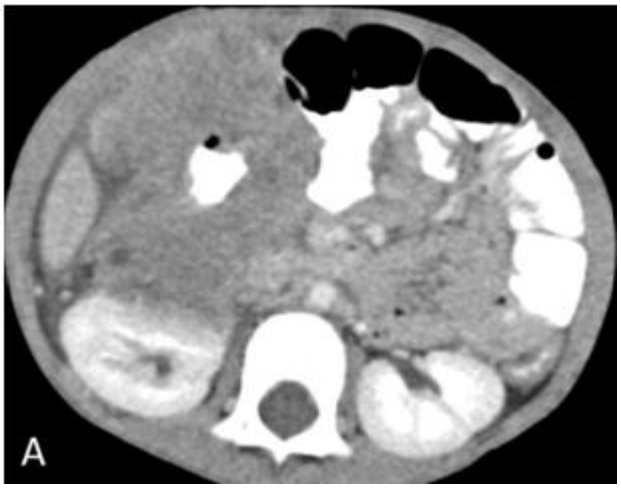
The abdominal US showed irregular isoechoic mass seen at right lumber region extending to epigastric area measuring 5.5 x 3.7 cm with air density is seen within and minimal amount of free fluid seen around it likely bowel in origin.

CT Abdomen with contrast showed: Circumferential segmental thickening of caecum ascending colon seen with patent lumen (Fig. 4).

US guided biopsy done and tissue from mass sent to histopathology showed: A picture compatible with fungal granulomatous reaction consistent with Basidiobolomycosis, no malignancy.

The Patient was diagnosed with Basidiobolomycosis of histopathology findings. She was started initaly on Tazocin and Ampho B then discontinued and start on voriconazole IV but her family signed to discharge her against medical advice, so she was discharged on oral voriconazole 20mg bid and multivitamins for 3 months.

After 3 months of treatment, she followed up in outpatient clinic, she was well with no active complain, ESR decreased to 18 and abdominal ultrasound showed 4 lymph nodes measuring about 1cm each, otherwise there were no masses. Therefore voriconazole has been discontinued, she did not present to any other clinic appointment, 2 years later, her father stated that she is doing well with no active complain.



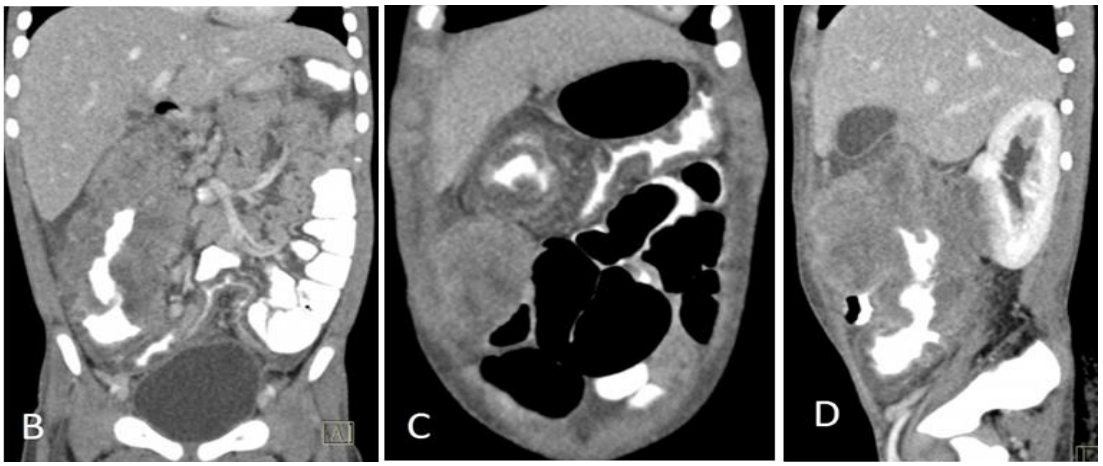


Figure 4: CT scan with 2D reformat (A-D) There is marked irregular mural thickening of the ascending and transverse colon with heterogeneous enhancement. The right anterior renal cortex appears ill-defined suggesting early extension into the renal cortex

4. Discussion

The first case of GIB was reported in a Nigerian child in 1964, reported paediatric GI basidiobolomycosis cases are 73 worldwide; 19 were from Saudi Arabia; Sixteen of the cases were from the Jazan provinces and two cases were from the Tohama area of Asser. All the locations are in southwestern Saudi Arabia, where GIB is endemic[3,4].

The most recent reported cases of GIB in Saudi Arabia between 2015 to 2020 were 5 cases, a case was reported in the southern region with retroperitoneal basidiobolomycosis who was presented with retroperitoneal fibrosis [5]

Another severe case lead to fatality was reported in the western region had a non-specific presentation and was misdiagnosed with appendicitis, histopathology is the only way to confirm the diagnosis of GIB [6].

The third case was reported in the western region with the commonest presentation of GIB, prolonged fever with diarrhea and vomiting, the fourth case was reported in the southern region with abdominal mass mimicking lymphoma. Both of the previous cases were managed properly with voriconazole without the need of any surgical intervention, surgical intervention is usually needed in GIB cases with obstruction of the bowel or serious pressure effects to the intraabdominal organs [7,8].

The last case was reported in the central region who was misdiagnosed many times with appendicitis , crohn's disease, basidiobolomycosis carries a high morbidity and mortality, if not diagnosed and managed early [9].

The presentation of basidiobolomycosisis vague. It commonly presents as abdominal pain,vomiting, diarrhea, prolonged fever, weight loss. Unlike adults, constipation is uncommon in children. Some cases have reported bowel obstruction, perforation, liver damage, renal system involvement[10-13]. In our cases, the patients presented with significant bloody diarrhea that lasted for over a month.

Patients with basidiobolomycosis are usually found to have peripheral eosinophilia, high ESR, and positive CRP which were present in our cases. Most of the reported cases are misdiagnosed as malignancy, Tuberculosis, or other chronic granulomatous diseases[14,15]. Our cases were admitted due to the suspicion of inflammatory bowel disease.

Radiologically, most of the cases reported as abdominal masses in the colon, liver, or small bowel that was revealed by physical examination, abdominal ultrasound, and CT scan with contrast[16,17].

Although, majority of the cases were diagnosed based on the biopsy and histopathological findings, which includes chronic granulomas rich in eosinophils and the Splendore–Hoeppli phenomenon, the definitive diagnosis was proven by a culture which is the gold standardand special stain for fungi (PAS)[18,19].

Specific therapy is started once the diagnosis has been confirmed. Some centers used the early surgical intervention in patients with GIB who presented with inflammatory masses to minimize morbidity and mortality. Although many reports show that antifungal therapy alone is sufficient in treating GIB, itraconazole was considered the drug of choice. Combination antifungal therapy has also been used with amphotericin-B and itraconazole. However, some reports from tissue biopsy have demonstrated some resistance to itraconazole. Because of it is side effects, some interest in using the second-generation azoles (voriconazole) to replace itraconazole in the management of GIB has occurred. Many reports showed successful treatment of GIB with voriconazole alone without surgical resection[20]. In our report, our experience with voriconazole has been positive and was successful in curing our patientswith no relapses.

5. Conclusion

There are few reports on GIB from other parts of the world, but most of the pediatric cases were reported in the south-west part of Saudi Arabia. The diagnosis of GIB requires a high index of suspicion. Increased awareness of this rare disease helps to reach an early diagnosis and initiation of treatment. In our case, voriconazole alone effectively treated the condition with less risk of complications than combined antifungal therapy and surgical treatment.

References

[1] Saadah, Farouq, Al Daajani, Kamal, Ghanem, O. M. N. J. A. (2012, April 1). *Gastrointestinal basidiobolomycosis in a child; an unusual fungal infection mimicking fistulising Crohn's disease*. Oxford Academics. https://academic.oup.com/ecco-jcc/article/6/3/368/475037.

[2] Albaradi, Babiker, Al-Qahtani, B. A. H. (2014, October 10). *Successful Treatment of Gastrointestinal Basidiobolomycosis with Voriconazole without Surgical Intervention*. Journal of Tropical Pediatrics. https://academic.oup.com/tropej/article/60/6/476/2843029

[3] Edington, G.M. Phycomycosis in Ibadan, Western Nigeria. *Trans. R. Soc. Trop. Med. Hyg.* 1964, *58*, 242–245

[4] Shreef, K., Saleem, M., Saeedd, M. A., &Eissa, M. (2018). Gastrointestinal Basidiobolomycosis: An Emerging, and A Confusing, Disease in Children (A Multicenter Experience). *European journal of pediatric surgery : official journal of Austrian Association of Pediatric Surgery ... [et al] = Zeitschrift fur Kinderchirurgie*, *28*(2), 194–199. https://doi.org/10.1055/s-0037-1598104.

[5] Alsharidah, A., Mahli, Y., Alshabyli, N., &Alsuhaibani, M. (2020). Invasive Basidiobolomycosis Presenting as Retroperitoneal Fibrosis: A Case Report. *International journal of environmental research and public health*, *17*(2), 535. https://doi.org/10.3390/ijerph17020535

[6] Arabi, R. I., Aljudaibi, A., Shafei, B. A., AlKholi, H. M., Salem, M. E., &Eibani, K. A. (2019). Paediatric case of gastrointestinal basidiobolomycosis mimicking appendicitis - Case report. *International journal of surgery case reports*, *63*, 80–84. https://doi.org/10.1016/j.ijscr.2019.09.001

[7] 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
[8] Almoosa, Z., Alsuhaibani, M., AlDandan, S., &Alshahrani, D. (2017). Pediatric gastrointestinal basidiobolomycosis mimicking malignancy. *Medical mycology case reports*, *18*, 31–33. https://doi.org/10.1016/j.mmcr.2017.08.002
[9] Saeed, A., Alsarkhy, A., Asmi, M. A., Mouzan, M. E., Hamid, Y., &Assiri, A. (2017). Ileocolonic Basidiobolomycosis in a Child: An Unusual Fungal Infection. *Journal of the College of Physicians and Surgeons--Pakistan : JCPSP*, *27*(8), 508–510.
[10] Bittencourt A.L. Ayala M.A. Ramos E.A. A new form of abdominal zygomycosis different from mucormycosis: report of two cases and review of the literature Am J Trop Med Hyg 28 1979 564–569
[11] El-Shabrawi M.H. Kamal N.M. Jouini R. Al-Harbi A. Voigt K. Al-Malki T. Gastrointestinal basidiobolomycosis: an emerging fungal infection causing bowel perforation in a child J Med Microbiol May 12, 2011
[12] Fahimzad A. Karimi A. Tabatabaei S.R. Zadeh M.G. Gastrointestinal basidiobolomycosis a rare etiology of bowel obstruction. Turk J Med Sci 36 2006 239
[13] Al Jarie A. Al-Mohsen I. Al Jumaah S. Al Hazmi M. Al Zamil F. Al Zahrani M.et al. Pediatric gastrointestinal basidiobolomycosis Pediatr Infect Dis J 22 2003 1007–1014
[14] N. Shaikh, K.A. Hussain, R. Petraitiene, A.N. Schuetz, T.J. WalshEntomophthoramycosis: a neglected tropical mycosis. Clin. Microbiol. Infect., 22 (2016), pp. 688-694
[15] G.M. Edington. Phycomycosis in Ibadan, Western Nigeria: two postmortem reportsTrans. R. Soc. Trop. Med. Hyg., 58 (1964), pp. 242-245
[16] K. Shreef, M. Saleem, M. Saeed, M. Eissa, Gastrointestinal basidiobolomycosis, an emerging, and a confusing, disease in children (a multicenter experience)Eur. J. Pediatr. Surg., 5 (5) (2016), pp. 131-134
[17] M.M. Al-Asmi, H.Y. Faqeehi, D.A. Alshahrani, A.A. Al-Hussaini case of pediatric gastrointestinal Basidiobolomycosis mimicking Crohn's disease. A review of pediatric literature, Saudi Med. J., 34 (2013), pp. 1068-1072
[18] Ribes JA, Vanover-Sams CL, Baker DJ. Zygomycetes in human disease. Clin Microbiol Rev. 2000;13:236–301.
[19] M.H. El-Shabrawi, N.M. Kamal, K. Kaerger, VoigtK. Diagnosis of gastrointestinal basidiobolomycosis: a mini-reviewMycoses, 57 (2014), pp. 138-143
[20] Al-Shanafey S, AlRobean F, Bin Hussain I. Surgical management of gastrointestinal basidiobolomycosis in pediatric patients. J Pediatr Surg. 2012;47:949–51.