



A Case Report on Recurrent Intestinal Obstruction with Relapsing Klebsiella and Candida Sepsis in a 6 Years Old Patient: A Rare Case Report from South India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Report

ABSTRACT

When the forward movement of intestinal contents is interrupted or impeded by a mechanical reason, it is referred to as an intestinal obstruction. In this case report, a 6-year-old pediatric patient presented with complaints of abdominal pain, abdominal distension, and bilious vomiting associated with nausea. In a shorter period, he had undergone two recurrent surgeries for intestinal obstruction and also had two different infections preceding the completion of the two surgeries. This report can give a clear picture that diagnosis serves as a gold standard for designing a pharmacotherapeutic plan to reduce the susceptibility to various pathogenic infections and reduce the length of hospital stay.

Keywords: *Intestinal obstruction; pediatric; Klebsiella; Candida; sepsis.*

1. INTRODUCTION

When the forward movement of intestinal contents is interrupted or impeded by a

mechanical reason, it is referred to as an intestinal obstruction. Adhesions (bands of scar tissue), hernias, and cancers usually cause this [1]. The clinical features of intestinal obstruction

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include abdominal pain, bilious vomiting, and abdominal distension. Imaging techniques like abdominal x-rays, ultrasonography, or computed tomography are predominantly used as diagnostic tools. Adhesions from previous abdominal surgeries are presumed to be the most common cause of bowel obstruction [2, 3]. Post-operative small intestinal adhesions that cause bowel obstruction are common in adults but not in children. In pediatric patients, the incidence of adhesive intestinal obstruction (AIO) necessitating surgical intervention ranges from 2 to 8% [4]. The following case report is about a 6-year-old male pediatric patient with recurrent intestinal obstruction due to adhesions and post-operative infections who had undergone two different surgeries and had been infected with two different organisms in a shorter period.

2. CASE REPORT

A 6-year-old male pediatric patient was admitted to a tertiary care hospital with complaints of abdominal pain, abdominal distension, and bilious vomiting associated with nausea, present for the past three days. The length of his hospital stay was 40 days. His prior medical history included a left congenital diaphragmatic hernia that was operated on during the 3rd day of his life and a subacute intestinal obstruction that was surgically repaired 4 years ago. He had the same complaints then as he does now. His abdominal examination showed sluggish bowel sound whilst the ultrasound abdomen revealed dilated jejunal bowel loops with peristalsis for which he was managed with intravenous (IV) fluids, 1 gm of Cefotaxime, and 150 mg of Metronidazole both given at an interval of 8 hours each via IV for 5 days. The symptoms were managed with Ondansetron, Pantoprazole, and Sucralfate.

His abdominal examination revealed soft, distended, and diffuse tenderness with a transverse scar at his left hypochondrium accompanied by an exaggerated bowel sound. An abdominal x-ray revealed multiple air fluids at his previous surgical site (Fig. 1). In view of persistent bilious vomiting for 5 days after admission, he was planned for diagnostic laparoscopy and adhesiolysis, but the procedure was changed to Laparotomy-Adhesiolysis + Resection of abdominal cocoon + Ladd's procedure with appendectomy + peritoneal lavage.

Post-procedure, he developed continuous fever spikes and was started on 800 mg of

Meropenem given three times daily for five days; 1.8 million units of Colistin given twice daily for five days; 200 mg of Teicoplanin given two times daily for three doses; and 50 mg of Tigecycline given twice daily for three days. He exhibited a continuous temperature spike, hypovolemic shock, and a high CRP level even after receiving antibiotic therapy. His blood culture revealed the presence of Multidrug (Carbapenem) Resistant Klebsiella Sepsis in his central venous line and bloodstream. The antibiotics were stepped up to 1.25 gm of Ceftazidime-Avibactam in 20 ml NS, 600 mg of Aztreonam in 15 ml NS, and 150 mg of Metronidazole administered three times daily for 10 days.



Fig. 1. Abdominal X-ray

Within an interval of 10 days after completion of the aforementioned procedure, he experienced bilious vomiting yet again and was confirmed to have an acute intestinal obstruction with a burst abdomen, necessitating Emergency Re-Exploration (Emergency Re-Laparotomy for Burst Abdomen)- Adhesiolysis + Stuck Bowel Resection + Proximal Jejunostomy + Distal Ileostomy + High Tension Abdominal Wall Closure). His intraoperative observations included complete muscle gapping, and a significant bowel herniation, with necrotic muscle margins. The primary anastomosis failed due to adhesiolysis, most likely due to iatrogenic causes. Part of the bowel was released. Edges were cleaned after the removal of the anastomosis. The rectum was mobilized superiorly and inferiorly, and a new incision was made to form the stoma. The wound was closed and the stoma was fixed with muscles.

He was paralyzed for 72 hours, extubated on post-operative day 3, and completed the treatment for multidrug-resistant (XDR) Klebsiella sepsis. He was started on peripheral parenteral

nutrition on the same day. On a post-operative day 7, he was started on oral feeds and refeeding through the ileostomy. Within this duration, he developed a new onset of fever and was restarted on 2 gm of Penicillin-Tazobactam given at a frequency of every 6 hours for the next 10 days, and 185 mg of Teicoplanin given twice daily for a week. His Peripherally Inserted Central Catheter (PICC) line and blood culture revealed Catheter-Related and Blood Stream Candida Sepsis requiring treatment of 30 mg of IV Micafungin once daily for the next 5 days and 570 mg of Amoxicillin+ Clavulanate thrice daily for four days, which was later switched to the oral form of 375 mg thrice daily for the next 2 days. He was discharged with a prescription for Domperidone suspension and Zinc supplement.

A month later, he was once again admitted for nutritional rehabilitation, ileostomy anastomosis, and closure. The child looked pale and emaciated and weighed about 16.6 kg. His abdominal examination showed the presence of ileostomy and jejunostomy stomas. His laboratory investigations revealed anemia (Hb-10.2 g/dl) with elevated liver enzymes (SGOT-60 U/L and SGPT-61 U/L). For nutritional rehabilitation, he was started on total parenteral nutrition (TPN) of 45ml/hr. for 20 hours for 2 days, later increased to 75 ml/hr. for the next day, and decreased to 60 ml/hr. For anemia, he was transfused with 1 unit of packed red cells (PRC) and fresh frozen plasma (FFP). An ileostomy closure was performed post-stabilization. He was administered 1.7 gm of IV Piperacillin-Tazobactam every 6 hrs. for 5 days, 175 mg of Teicoplanin twice daily for three doses, converted to once daily for the next three days, 20 mg of Pantoprazole once daily in the morning for five days, 200 mg of Paracetamol every 6 hrs. for 3 days, later switched on to SOS medication followed by a continuation of TPN at 50ml/hr. for the next 2 days. Oral feeding was started from post-op day 3. On complaints of constipation, he was given a Bisacodyl suppository of 5 mg per rectally on post-op day 5. On the same day, he underwent a urine routine examination, which revealed a pH of eight, a turbid appearance, and the presence of blood, RBC, pus cells, and amorphous phosphate. He was treated with 5 ml of Disodium Hydrogen Citrate syrup thrice daily, 250 mg tablet of Ciprofloxacin twice daily, and 30 mg tablet of Lansoprazole once daily for three days. He was then discharged with a prescription continuing with the same medications with addition of Mupirocin ointment to be applied over

the surgical site twice daily for 1 week and a gel composed of Allium Cepa extract, Hydrogen Sodium, and Allantoin to be applied over the previous surgical scar and gently massaged twice daily for 10 days.

3. DISCUSSION

During his hospitalization, the patient presented clinical signs of severe intestinal obstruction, eliciting an abdominal x-ray. A diagnostic laparoscopic operation was performed, which was later modified into an elaborate surgical procedure. He showed signs of infection after the procedure, but no culture tests were performed until the condition persisted for an extended time. The culture report revealed that he was resistant to the antibiotics that had been started. Owing to the lack of a precise diagnosis, his hospital stay was prolonged, resulting in increased susceptibility to nosocomial infections.

Diaphragmatic hernia increases the risk of Small bowel obstruction (SBO) development. SBO appears to be more likely to occur due to laparoscopies [5]. Adhesions remain a common side effect of abdominal surgery. Despite advances in surgical techniques, the cause of adhesion formation remains unknown. Adhesions remain a mystery, not only in terms of their occurrence but also of their complications, like Adhesive intestinal obstruction that can occur as soon as one week after surgery and as late as 12 years later. There are evidences of adhesions causing obstruction continuously for up to 28 years after surgery, demonstrating the significance of long-term monitoring [6].

Klebsiella Pneumoniae is a major pathogen implicated in nosocomial infections that is known to spread quickly, and it is frequently associated with resistance to the most important critical antimicrobial agents [7]. Cases of Carbapenem-resistant and Colistin-resistant Klebsiella sepsis have been reported in recent decades. For both, the drugs of choice are Ceftazidime-Avibactam and Aztreonam [8, 9].

When intestine, omentum, or other viscera are seen in the abdominal wound following obstetric surgery, a burst abdomen is considered present. There has been no research in South-India, but the observational incidence in tertiary hospitals ranges between 0.2 and 3%. It usually happens between the sixth and eighth days after the surgery. Suture closure, incisions, coughing, vomiting, distension, obesity, jaundice,

malignancy, diabetes mellitus, hypoproteinemia, anemia, immunocompromised patients, and wound infection are all risk factors for burst abdomen. Following any laparotomy, abdominal wound dehiscence is a major cause of morbidity [10]. General risk factors for recurrent SBO development in young children include stoma history, emergency surgery, and post-operative infections [11]. However, operational adhesiolysis is known to be associated with a high rate of adhesion reformation [12]. Multiple operations are another factor that contributes to adhesion formation. Multiple operations have been linked to increased fibrin deposition, which tends to form bridges between adjacent tissues, resulting in adhesions that can be degraded by fibrinolytic factors. However, this is not always the case, as surgery, infection, and hypoxia are all known to reduce fibrinolytic activity. Rapid wound healing in children may explain why they have a lower incidence of adhesions than adults. The exact incidence of adhesive intestinal obstruction in children is unknown, but it has been reported to range between 2.2 and 8.3 percent. In adults, adhesive intestinal obstruction is considered the second most common cause of intestinal obstruction after obstructed abdominal wall hernias in many countries [13, 14].

Candidemia is a life-threatening infection associated with high crude and attributable mortality rates, along with increased healthcare costs and a prolonged duration of hospitalization. The global incidence of Candidemia is reported to be 6.7–54 per 1000 ICU patients. Many risk factors have been linked to the development of Candidemia, including broad-spectrum antibiotics, the presence or prolonged use of central venous catheters (CVCs) and other invasive devices, total parenteral nutrition (TPN) administration, ICU admission, and complicated surgeries. Catheter-related bloodstream infections (CRBSI) increase mortality rates, duration of stay, and hospital expenditures, all of which have an effect on the patients' prognosis and quality of life. Removal of the catheter alone is not an adequate treatment for Candidemia; it has to be combined with an antifungal therapy [15, 16].

4. CONCLUSION

While hospitalized, all patients require constant monitoring, but pediatric patients have a far greater need for care. Continuous monitoring reduces the length of hospital stay, pharmacoeconomic cost, and some well-known

nosocomial infections, whilst increasing the patient's quality of life. This can only be achieved via collaboration between clinical professionals and hospital committees like the infection control committee in the prevention of nosocomial infections, antimicrobial resistance, and the appropriate use of antibiotic therapy. "Evidence-based practice" and "Practice-based evidence" is always vice versa, and thus should be encouraged.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

CONSENT

The patient's parents provided written consent.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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