ISSN 2689-8268 | Volume 5

American Journal of Surgery and Clinical Case Reports

Case Report Open Access

Case Report: Unusual Volvulus with Internal Herniation Through a Defect in the Small Bowel Mesentery

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Received: 13 Jun 2022
Accepted: 22 Jun 2022
Published: 28 Jun 2022
J Short Name: AJSCCR

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Citation:

Tamadher Al Barhi. Case Report: Unusual Volvulus with Internal Herniation Through a Defect in the Small Bowel Mesentery. Ame J Surg Clin Case Rep. 2022; 5(2): 1-4

Keywords:

Abdomen; Volvulus; Recurrent volvulus

1. Introduction

Internal hernia (IH) is a protrusion of intra-abdominal viscus, usually the small bowel, through an aperture in the peritoneum or the mesentery within the abdomen or the pelvis [1]. Internal hernia can be congenital like paraduodenal and pericecal or acquired like post-surgery or due to a blunt abdominal trauma. Herniation through the omentum in a virgin abdomen is rare but has been reported in some case series due to congenital omental defect [2]. Although IH is rare, it causes 0.6– 5.8% of small bowel obstruction [1]. Due to growing of the surgical procedures like gastric bypass for bariatric management and liver transplantation, the incidence of internal hernia has increased recently [1]. IHs can remain silent for many years if easily reducible, but they can present with mild gastrointestinal symptoms or even acute abdomen with high mortality rate [1]. Herniation of the small bowel together with the sigmoid colon is an unusual event and can cause a fatal closed loop obstruction. Some patients have been managed with colonoscopic decompression for an impression of simple sigmoid volvulus, however, they do not improve, and after careful evaluation with computed tomography (CT scan), the definitive diagnosis of internal hernia is found and the management is changed to be surgical. Thus, careful investigation should be carried out before a management is initiated [3]. We present our experience with an adult male patient who presented with internal hernia due to a congenital mesenteric defect with concomitant small and large bowel obstruction which both required resection.

2. Case Summary

A previously healthy 62 years old smoker male patient presented to our emergency department for the first time in September 2020 complaining of lower abdominal pain. At that time, he was hemodynamically normal and his abdominal pain was mild. An abdominal x-ray was done which showed dilated small bowel loops with impacted stool, however there were no features suggestive of bowel obstruction or perforation (Figure 1). He was referred to surgical team for further review but the patient felt better and left the hospital before the surgical team arrive. He came back again in April 2021 complaining of bleeding hemorrhoids which were grade 2. He was discharged on conservative management and given a follow up appointment in the surgical out-patient department.

Then the patient disappeared from the hospital until he showed up to the emergency department in March 2022 complaining of perianal pain as well as abdominal pain. Upon clinical assessment, he was hemodynamically normal, there was a non- complicated grade 3 hemorrhoid which was possible to be reduced manually. Regarding his abdominal pain which started the prior day, it was diffuse and not associated with nausea, vomiting, fever nor changes in bowel habit, which is constipation for him. Clinical examination showed a heart rate of 112, blood pressure 112/81 and a soft abdomen with mild diffuse tenderness. Initial laboratory investigations were as follow: hemoglobin of 15.4 g/dL, white blood cell count 9.9x10^9/L, neutrophils 8.8x10^9/L, platelet count 328x10^9/L, c-reactive protein <4 mg/L, pH 7.31, Lactate 2.8 mmol/L eGFR >90 mL/min/1.73m2, Creatinine 66, normal liver function tests. Abdominal x-ray showed dilated bowel loops with air-fluid level with impacted stool in the colon (Figure 2), thus the patient was discharged on laxatives and analgesia, and was advised to report back to the hospital if his symptoms worsen or do not improve. Within less than 24 hours, he came back with worsening abdominal pain. On clinical assessment the patient was crying in pain, his temperature was 36.7, heart rate was 125, blood pressure 98/55 and respiratory rate of 40 breath/minute. His abdomen was dis-

tended, tense, tympanic on percussion and tender all over. Initial blood investigations showed hemoglobin 13.8 g/dL, white blood cell count 10.6x10^9/L, neutrophils count 7.7x10^9/L, platelet count 278x10^9/L, c reactive protein 100 mg/L, pH 7.18, Lactate 10.7 mmol/L, eGFR 24 mL/min/1.73m2, Creatinine 251, normal liver function tests. The patient was resuscitated immediately with IV fluid boluses, analgesia and broad-spectrum antibiotic (Tazocin). A Foley's catheter inserted, however there was no urine output. Abdominal x-ray showed coffee bean sign which is suggestive of sigmoid volvulus [Figure 3]. The initial plan was to get a CT scan to further assess the pathology but because of the acute kidney injury and the patient's critical status, this was canceled and the patient was taken for exploratory laparotomy after receiving the required resuscitation. Intra operatively, there was a sigmoid volvulus which was herniating together with a part of small bowel through a defect in the small bowel mesentery (Figure 4,5). The sigmoid colon and the herniated small bowel were gangrenous [Figure 6]. There was free hemorrhagic peritoneal fluid as well. The hernia was reduced and the gangrenous colon and small bowel were resected. Anastomosis was re- established by side-to-side anastomosis using a GIA stapler. Post operatively, the patient was monitored in an intensive care unit bed for 24 hours then shifted to a normal bed. He was kept nil per mouth and was on IV fluids as well as antibiotics and analgesia together with physiotherapy. On day 3 post operatively, bowel function started and diet was resumed slowly. He was discharged on day 7 post operatively in a good clinical health. The patient was seen in the surgical outpatient department and he was doing well.

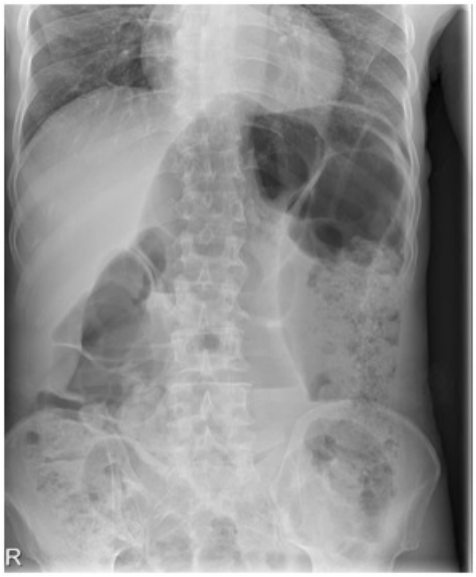

Figure 1: Upright abdominal x-ray in 2020.

Figure 2: Upright abdominal x-ray upon initial presentation, March 2022.

Figure 3: Supine abdominal x-ray on the next presentation, After 12 hours.

Figure 4: The surgeon is holding the herniated bowel and the assistant pointing the defect.

Figure 5: The mesenteric defect.

Figure 6: The surgeon holding the herniated small bowel after reduction which looks necrotic.

3. Discussion

Although internal hernia is a rare cause of intestinal obstruction, it carries high mortality rates when it happens. There are around 8 types of internal hernia including: para-duodenal 53%, peri-cecal 13%, foramen of winslow 8%, trans-mesenteric 35%, inter-sigmoid 6%, supra-vesical 6%, retro-anastomotic 5% and trans-omental 1-4% [4]. In adult patients, the incidence of acquired internal hernia is higher than congenital internal hernia with hernia through foramen of winslow being the most common, followed by trans-mesenteric hernia [4]. A defect in the mesentery can be congenital and usually present in children but can present at any age. In our patient, there was no risk factor for him to have a mesenteric defect, so a congenital mesenteric defect is the most likely possible etiology. Interestingly, his presentation a year ago with abdominal pain could be also explained by an internal hernia through the same mesenteric defect but have reduced spontaneously after receiving hydration and analgesia. The presentation of IH varies from vague abdominal discomfort to severe abdominal pain and tenderness. The diagnosis cannot be made easily with the clinical assessment or by the regular x-ray modality only. And although, CT scan is the gold standard technique to diagnose IH with 76% specificity and 63% sensitivity, it is still difficult to make the diagnosis [5]. In our patient, it was not feasible to get a CT scan as he was not hemodynamically stable enough to wait for the CT scan knowing that he will eventually require a surgical management for his bowel obstruction giving his abdominal examination findings and the high lactate level. Also, his deranged kidney function opted against waiting for a CT scan. IH management requires urgent reduction of the herniated segments with careful handling of the bowel to avoid iatrogenic injuries. The bowel should be assessed for viability; otherwise resection should be done.

4. Conclusion

Internal hernia although is rare but can present with small and large bowel obstruction. The most common type of internal hernia is hernia through the foramen of winslow, followed by trans-mesenteric defect. Careful diagnosis should be made with a CT scan if feasible as IH can be missed as a simple bowel obstruction. IH can reduce spontaneously, however, a surgical management is usually required to treat the primary etiology.

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