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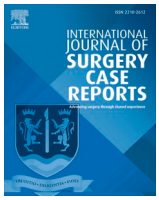

Case report

Paraduodenal hernia with situs inversus abdominalis: A case report

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ABSTRACT

Introduction & importance: Situs Inversus Abdominalis (SIA) & Paraduodenal Hernias (PDH) are extremely rare causes acute surgical emergencies among adults. We present a case of an adult patient with intestinal obstruction secondary to PDH through the fossa of Landzert with concurrent SIA.

Presentation of case: A thirteen-year-old Southeast Asian female with situs inversus abdominalis due to Kartagener syndrome presented with bowel obstruction. The patient failed conservative management and required surgical intervention. A diagnostic laparoscopy was done followed by laparotomy. Intraoperatively, there was a paraduodenal mesentery defect at the duodenojejunal junction with internal herniation of the terminal ileum and caecum. Successful reduction of bowels and closure of the mesentery defect was done without any bowel resection.

Discussion: Only three cases of bowel obstruction secondary to SIA have been documented in literature. This is the fourth and the only case to have concurrent paraduodenal hernia. Surgical repair of PDH is mandatory to avoid the increased risk of incarceration or strangulation however pre-operative diagnosis of PDH resembles a diagnostic challenge especially among patients with intestinal anomalies.

Conclusion: Intestinal malrotation is known to be the most common cause of intestinal obstruction in patients with intestinal anomalies. However, clinicians should maintain a high index of suspicion of intestinal herniation and adhesions as the cause of intestinal obstruction in such cases. Further imaging such as computed tomography (CT) scan and diagnostic laparoscopy may be beneficial provided patients have no overt signs of acute bowel ischaemia.

1. Introduction

Situs inversus abdominalis (SIA) is a rare condition of congenital intestinal rotational anomaly and has been recognized as a cause of intestinal obstruction among paediatric population. Paraduodenal hernias (PDH) account for up to 53 % of all internal hernias, but cause <1 % of all cases of intestinal obstruction [1]. This case describes an adult patient who presented with intestinal obstruction secondary to PDH through the fossa of Landzert with concurrent SIA. This report has been reported in line with the SCARE criteria [2].

2. Patient information

A 13-year-old Southeast Asian female presented to the Emergency Department at a tertiary hospital in East Malaysia. Her symptoms included one week history of abdominal distension and vomiting. Her past medical history included Kartagener syndrome with thoracic and abdominal situs inversus which was diagnosed at birth. She had frequent admissions for pneumonia but no significant past surgical history.

3. Clinical findings & diagnostic assessment

Upon presentation she was hemodynamically stable with blood parameters within normal limits. Abdominal examination revealed a distended abdomen without any tenderness, guarding or rigidity. Abdominal radiograph revealed small and large bowel obstruction with no clear transition point. She was diagnosed with intestinal obstruction due to malrotation due to known case of SIA and was treated conservatively however her symptoms worsened during admission with abdominal pain, worsening distension and profuse vomiting.

4. Therapeutic intervention

The patient was taken to the operating theatre for a diagnostic

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laparoscopy. Surgery was done by a general surgeon. A supraumbilical incision was given and intra-operative findings were of SIA, left sided liver and caecum with right sided stomach and spleen. Small and large bowel were dilated with serous fluid in peritoneal cavity. The omentum was wrapped around the bowels. Decision was made to convert to midline laparotomy due to the dilated bowels. The duodenojejunal junction and proximal jejunum was arising from the right upper quadrant with dilated small bowel distal to duodenojejunal junction. There was a paraduodenal mesentery defect at the duodenojejunal junction with internal herniation of the terminal ileum and caecum which were reduced without much difficulty (Fig. 1). Distal jejunum till terminal ileum appeared congested however after resuscitation with 100 % oxygen, bowels appeared pink with good peristalsis (Fig. 2). The PDH mesenteric defect was closed with Vicryl 3/0 suture interrupted. Appendicectomy was done followed by small and large bowel arranged in its natural position with the caecum at left iliac fossa and sigmoid over right iliac fossa. Peritoneal cavity was washed with warm normal saline, closure of rectus with 1–0 polydioxanone sutures (PDS) and staples to skin.

5. Follow up & outcomes

Post-operatively, the patient was managed in general surgical ward with intravenous fluid therapy, nasogastric tube decompression and analgesia. The patient recovered well, able to empty her bowels on the third post-operative day with resumption of normal diet and was discharged. Upon review in the outpatient clinic one-month post-operative, the patient had made a full recovery. Two years following her surgery, the patient presented again with two days history of abdominal pain, distension and vomiting. She was hemodynamically stable however abdomen was tender but not guarded. CT demonstrated mirrored anatomic location of the intra-abdominal viscera with evidence of dilated jejunal loops at the right side of abdomen (Fig. 3). Transition zone of jejunal dilatation was at the mid abdomen just above the umbilicus level. At this point, provisional diagnosis was intestinal obstruction due to adhesions with a differential of malrotation.

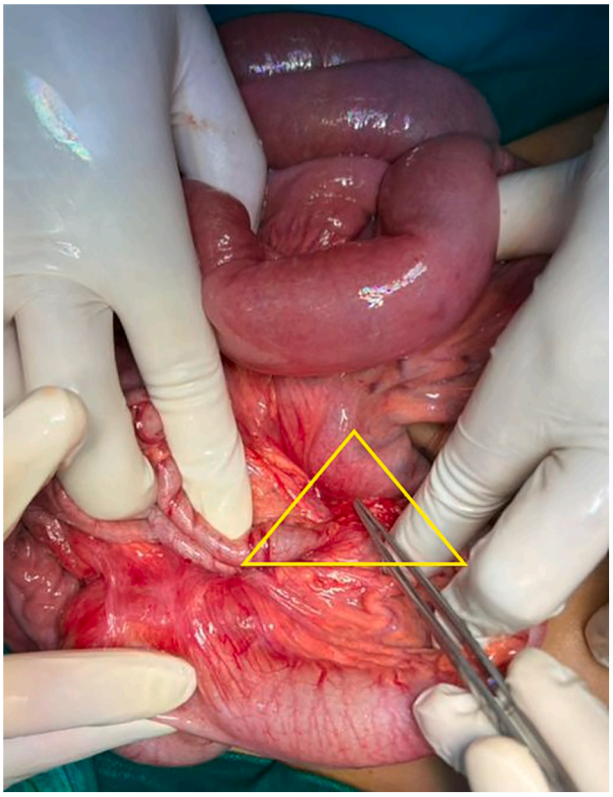

Fig. 1. Intraoperative image (from patient's left side) demonstrating paraduodenal mesentery defect at the duedonojejunal junction (in yellow triangle line).

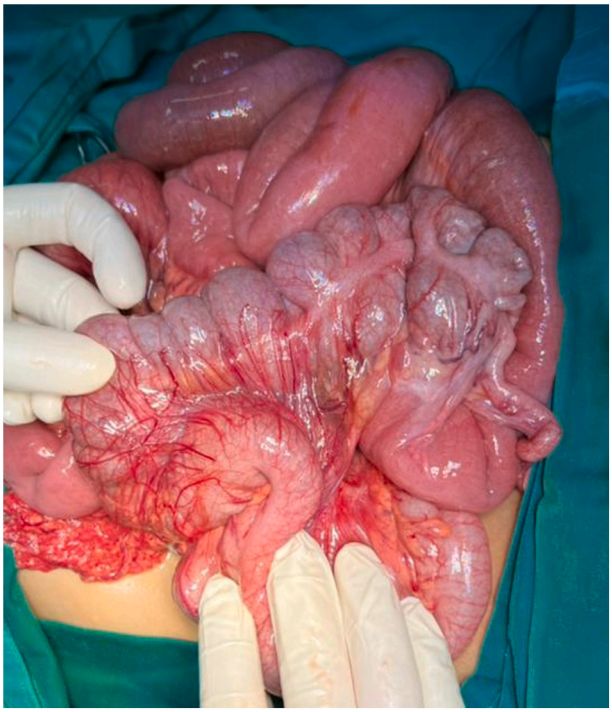

Fig. 2. Intraoperative image (from patient's left side) demonstrating terminal ileum and caecum appear pink and healthy after resuscitation with 100% Oxygen.

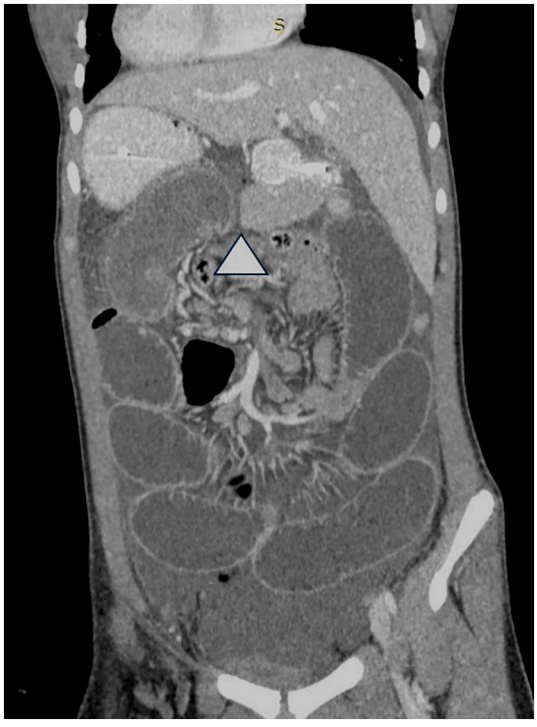

Fig. 3. Contrast enhanced computer tomography scan in coronal section demonstrating situs inversus abdominalis with dilated jejunal loops at the right side of abdomen and *(arrow)* transition zone at the mid abdomen just above the umbilicus level.

Midline laparotomy was done along the previous incision site. Intraoperatively, there was dense adhesion between the small bowel and anterior abdominal wall along the previous laparotomy wound (Fig. 4). Dilated small bowel proximal to this adhesion point about 150 cm from the duodenojejunal junction. Complete adhesiolysis was done with blunt and sharp dissection. There were no other adhesion points, malrotation or internal herniation. Rectus was closed with 1–0 polydioxanone sutures (PDS) and staples to skin. Post-operatively, the patient was able to empty her bowels on the third post-operative day with resumption of normal diet and was subsequently discharged. Upon review in the outpatient clinic three-month post-operative, the patient made a full recovery.

6. Discussion

Three cases of small bowel obstruction with SIA in adult patients have been documented in the literature [3–5]. One case by Brown et al. was a case of ischaemic small bowel obstruction secondary to herniation through a congenital mesenteric defect [3]. The second was by Mallick et al. detailing intestinal ischemia secondary to malrotation with Ladd's band [4]. The third was by Danika et al. depicting a 38-year-old female with history of omphalocele repair presented with small bowel obstruction secondary to adhesions [5]. To our knowledge, this is the fourth case of small bowel obstruction in an adult patient with SIA and the only adult patient to have small bowel obstruction due to paraduodenal hernia defect with SIA.

More than half of patients with PDH or SIA are asymptomatic with most cases of PDH being diagnosed intraoperatively, at autopsy or during radiological investigations [6,7]. Surgical repair of PDH is mandatory to avoid the increased risk of incarceration or strangulation which accounts for 20–50 % mortality rate [6]. Therefore, pre-operative diagnosis of PDH resembles a diagnostic challenge especially among patients with intestinal anomalies. There aren't any typical set of symptoms diagnostic to this clinical problem. In this patient, further imaging such as computed tomography (CT) scan would have been useful to aid in diagnosis however it was not done as intestinal malrotation was commonly known to be the cause of intestinal obstruction in patients with intestinal anomalies. Another suitable approach for such cases would be a diagnostic laparoscopy as advocated by some centres [8].

7. Conclusion

Adult presentation of acute intestinal obstruction with underlying situs inversus abdominus is a difficult diagnosis due to its rare incidence. Despite intestinal malrotation being the most common cause, a high index of suspicion of other causes of acute intestinal obstruction is required such as intestinal herniation due to mesenteric defects and adhesions due to previous surgery. Low threshold for exploratory surgery should be maintained in patients with major congenital abdominal anomalies presenting with acute abdomen. Computed tomography (CT) scan and diagnostic laparoscopy may be used as part of a thorough investigation of situs inversus patients presenting with acute abdomen provided patients are clinically stable and have no overt signs of acute bowel ischaemia.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Ethical approval

Nil ethical approval was required as this study was a retrospective case report and is exempt from ethical approval at the detailed institution.

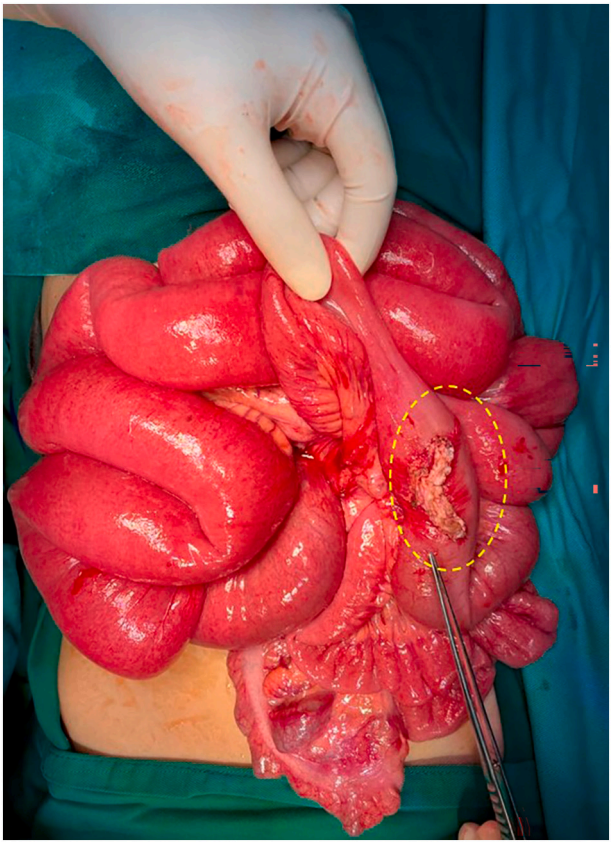

Fig. 4. Intraoperative image (from patient's feet) demonstrating evidence of dense adhesion between the small bowel and anterior abdominal wall (dashed line in yellow).

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Guarantor

Aravinthan Kadravello.

CRediT authorship contribution statement

Aravinthan Kadravello (corresponding author) - Study concept & design, data collection, writing the paper
Jane Chuah Wai Yee - Study concept & design, data collection
Pradeep Chand Chandran - Study concept & design, data collection.

Declaration of competing interest

The authors declare no conflicts of interest.

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