CASE REPORT

Midgut Malrotation in an Adult Presenting as an Acute Abdomen

ABSTRACT

Introduction: Midgut malrotation is a rare congenital anomaly in adults that can cause acute abdomen due to bowel obstruction and ischemia. Early diagnosis is challenging but crucial to prevent severe complications.

Case Presentation: A 26-year-old male presented with acute abdominal pain, bilious vomiting, and obstipation. Imaging revealed small bowel obstruction. Emergency surgery showed midgut volvulus with extensive gangrenous bowel requiring resection. Only 30 cm of healthy small bowel remained, and a jejunoileal anastomosis was performed.

Results: Postoperative management included total parenteral nutrition and gradual oral feeding. The patient developed features of short bowel syndrome due to massive bowel loss but was discharged with follow-up care.

Conclusion: Adult midgut malrotation, though rare, should be considered in acute abdomen cases without prior surgery. Prompt diagnosis and surgical intervention are essential to reduce morbidity and mortality.

INTRODUCTION

Intestinal malrotation refers to the partial or complete failure of 270^0 counterclockwise rotation of midgut around the superior mesenteric vessels in embryonic life[1]. ligaments of Treitz is not formed and distal duodenum and jejunum is aligned on the right side of columna vertebralis in these patients[2]. It increases the risk of small bowel obstruction, strangulation and bowel necrosis. Most of the patients with malrotation present within first month of life and intestinal malrotation in adults is in the ratio of 0.2-0.5%. The rate of incidence is approximately the same for men and women. Malrotation is the most frequent reason of midgut volvulus in adults and obstruction is observed mostly in colon[3].

PRESENTATION OF CASE

A 26 years old male student admitted via accident and emergency unit with continuous abdominal pain, bilious stained vomiting, initially passage of melena and obstipation for 48hours. He had been experiencing multiple episodes of abdominal pain for the past two years. No history suggestive of tuberculosis and no previous abdominal surgery. He is not a known hypertensive patient and no history suggestive diabetic mellitus. The vital signs on admission were measured as blood pressure 100/60mmHg, pulse rate 130/min and temperature 37.8 ^{0}C. The systemic examination was unremarkable. Abdominal examination revealed abdominal distension, board-like abdomen and generalized abdominal tenderness. Rectal examination showed examining finger stained with altered blood. Plain abdominal X ray with supine

Keywords: midgut malrotation, surgical abdomen, bowel obstruction, case report.

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and erect view showed multiple air-fluid. Bloodwork was unremarkable

The patient was admitted with provisional diagnosis of acute intestinal obstruction and was managed with nasogastric decompression and fluids. He was subsequently planned for emergency exploratory laparotomy. The midgut was delivered into the operative field, and volvulus twisted through counter-clockwise rotation. There were signs of intestinal ischaemia. The intraoperative findings were: gangrenous small bowel loops predominantly on the right side of the abdomen extend from 10cm from DJ flexure to 20cm from ileocecal junction, hiding the colon, and duodenojejunal junction remaining to the right of the midline. Ischaemic bowel segments were resected and only 30cm of healthy-looking small bowel was left. Jejunoileal anastomosis was done. Postoperatively the patient was given total parenteral nutrition for 1 week and commenced on graded oral feed thereafter. He was subsequently discharged post operative day 7 on tabs loperamide and for follow up in the clinic.

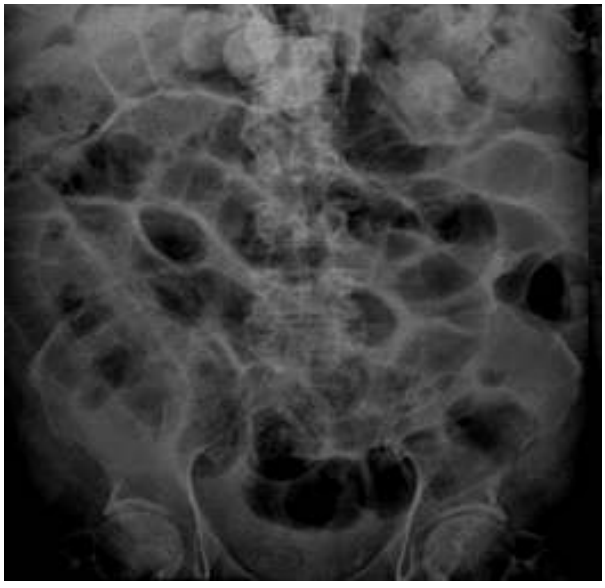

Fig 1. Multiple air-fluid was present on plain abdominal radiography

Fig 2. Exploration revealed twisted gangrenous small bowels around mesentery

Fig 3. Post resection of gangrenous bowel

DISCUSSION

Malrotation of the gut is the complete or partial failure of 270^0 of counterclockwise rotation of midgut around the superior mesenteric pedicle[4]. Malrotation in adults is rare and occurs with obscured clinical symptoms, such as recurrent abdominal pain and vomiting, often resulting in multiple hospital visits and posting a diagnostic dilemma to the unpolished surgeon[4]. Midgut malrotation may present in acute condition, due to midgut volvulus, and may cause bowel ischaemia and gangrene. The result of this is dangerous and often lead to massive bowel gangrene, short bowel syndrome and death. Early recognition and detection of midgut volvulus is the key to reduction of morbidity and mortality. A high index of suspicion is of paramount important in patients with intermittent abdominal pain, bilious vomiting, no preceding surgical history, and no history of suggestive of tuberculosis. Our case emphasizes the importance of considering intestinal malrotation in adults with intestinal obstruction at accident and emergency units. The incidence of this anomaly in adults is estimated between 0.00001% and 0.19%[5]. Autopsy diagnoses have revealed population figures of around 0.03%. This anomaly is frequently associated with congenital malformations and morbidity, making it essential to evoke this diagnosis at an early stage by a CT scan with contrast injection to optimize patient management[5].

Normal midgut development is a complex process that requires 270^0 counter-clockwise rotation of the gut tube around the SMA axis[6]. This rotation usually occurs between the 4th- 10th week of gestation creating a broad-based mesentery extending from the ligament of Treitz in the left upper quadrant, to the ileocecal valve in the right lower quadrant with retroperitoneal attachment to the duodenum and colon[6]. In normal anatomical configuration, broad-based mesentery prevents volvulus formation.

In midgut malrotation, investigation such as plain abdominal radiography, ultrasonography and computerized tomography scan help in diagnosis. Contrast enhanced radiography has been shown to be the most accurate method[7]. Typical radiological signs are corkscrew sign, which is caused by the dilatation of various duodenal segments at different levels and the relocation of duodenojejunal junction due to jejunum folding[7]. In ultrasonography, the superior mesenteric vein lies to the left or anterior to the superior mesenteric artery. Jejunal arteries lie to the right instead of the left in computerized tomography scan as another diagnostic sign of malrotation[8]. Since malrotation commonly causes intestinal obstruction, all patients deserve elective laparotomy[9].

Our case focuses on critical rare subject as a cause of intestinal obstruction. Clinical presentation of adult midgut volvulus can be obscured, even though abdominopelvic computed tomography may suggest bowel twisting and strangulation. Late presentation is commonly associated with extensive intestinal necrosis leading to massive intestinal resection causing short bowel syndrome with other complications. We observed massive necrosis in small intestine during the emergency exploratory laparotomy. Massive resection of the small bowel to save the patient of post operative sepsis, followed by total parenteral nutrition for 1 week to reduce complications associated with short bowel syndrome. The remaining length of small bowel was insufficient, the patient unavoidably suffered from short bowel syndrome. A lot effort was instituted to overcome excessive high fluid -electrolyte loss and to deliver adequate nutritional requirement. Care of patients with short bowel syndrome is greatly challenging and also associated with complications such as malnutrition, electrolyte derangement, immune deficiency, hypovolaemic shock, organ failure and sepsis. Refeeding enteroclysis is a helpful option in such patients, usually requires a considerable amount of healthy distal small for absorption of nutrients, bile salts and fluids[10]. Our patient was left with 20cm of distal ileum, refeeding enteroclysis was thought considering the cost of total parenteral nutrition in developing country but due to practicality, complications associated with refeeding enteroclysis was not done. Despite strict effort to maintain fluid- electrolyte balance and to supply adequate nutritional requirement through parenteral formulas, he developed features suggestive of short bowel syndrome. Finally, he was discharged on oral loperamide with atropine.

This case shows us that early recognition and high index of suspicion of midgut volvulus as a cause of intestinal obstruction is the key to reduce morbidity and mortality, but massive small intestine resection is sometimes inevitable and may be associated with vital consequences.

CONCLUSION

The diagnosis of adult midgut malrotation requires high index of suspicion. Patients with intermittent abdominal pain, bilious vomiting with no history suggestive of tuberculosis or previous history of abdominal surgery should be suspected. Abdominopelvic ultrasound is of paramount important in accident and emergency department to detect adult midgut malrotation early by looking for the reversed relation of superior mesenteric vessels. Early diagnosis will reduce morbidity and mortality.

Limitation

Reliance on plain abdominal radiography and ultrasonography might result in missed or delayed diagnosis, especially given the obscure clinical manifestations of adult midgut malrotation.

Conflict of Interest Declaration

The authors declare that there are no conflicts of interest related to this case report.

Ethical considerations

Informed consent was obtained from the patient for publication of the clinical details and accompanying images.

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