

## CASE REPORT

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# Diagnostic Conundrum in Intestinal Obstruction; Malrotation in Elderly

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**ABSTRACT** Congenital intestinal malrotation is an anomaly of intestinal rotation and fixation which occurs during fetal development. It is rare for a malrotation to be present in adulthood. Indeed, most adult patients are asymptomatic and are later discovered incidentally during operation for other clinical conditions. Here we presented a case of malrotation in a 79-year-old elderly man presented with intermittent colicky abdominal pain, obstipation and vomiting for 2 days. Abdominal examination revealed distended abdomen, tenderness at right upper abdominal quadrant and peritonism. A contrast-enhanced computed tomography scan of the abdomen showed small bowel malrotation with suspected volvulus. The patient underwent exploratory laparotomy in which the intraoperative findings were small bowel malrotation, tight Ladd's band and midgut volvulus on top of perforated gallbladder empyema. The patient also underwent cholecystectomy, release of Ladd's band, re-rotation of the bowel, fixation of caecum to the left lower quadrant and appendicectomy. A complete recovery and relief of gastrointestinal symptoms were achieved postoperatively.

**Keywords:** Midgut volvulus; intestinal volvulus; laparotomy; intestinal obstruction

Congenital intestinal malrotation resulted from incomplete 270 degrees counterclockwise rotation of the midgut around the superior mesenteric vessels during fetal development.<sup>1</sup> It is a rare disease estimated to occur in 1:500 live births with vast majority of them diagnosed during neonatal life.<sup>2</sup> It rises a diagnostic challenge in adult patients due to its rare incidence. Moreover, they remained asymptomatic and had been diagnosed incidentally during operation for other clinical conditions.<sup>3</sup> In this case, a rare cause of intestinal obstruction was illustrated in the elderly presented with symptoms suggestive of an intestinal obstruction with clinical sign of peritonitis, yet with the use of imaging modality, malrotation was diagnosed preoperatively. A pre-planned operative intervention successfully treated the intraabdominal pathology.

## CASE REPORT

A 79-year-old Malay gentleman with comorbid hypertension, diabetes and Parkinson's disease was presented

with progressively worsening intermittent colicky abdominal pain for 2 days, which is more at the right side of the abdomen. There was no specific aggravating and alleviating factor, no radiation to the back or shoulder, yet it was associated with obstipation and vomiting since the onset of pain. He had history of intermittent chronic constipation for the past few years and relied on laxatives to improve his symptoms. Apart from that, he had no history of previous surgery, a non-smoker and no family history of malignancy.

During physical examination, the patient was feverish and had tachycardia but remained normotensive with good urine output. Abdominal examination revealed slightly distended abdomen, tenderness at right hypochondriac and right lumbar region, and presence of local peritonism. Otherwise, there was no palpable mass, no ascites and bowel sound was hyperactive. Per-rectal examination revealed an empty rectum. An abdominal X-ray supine showed dilated small bowel with a diameter of 4 cm. The arterial

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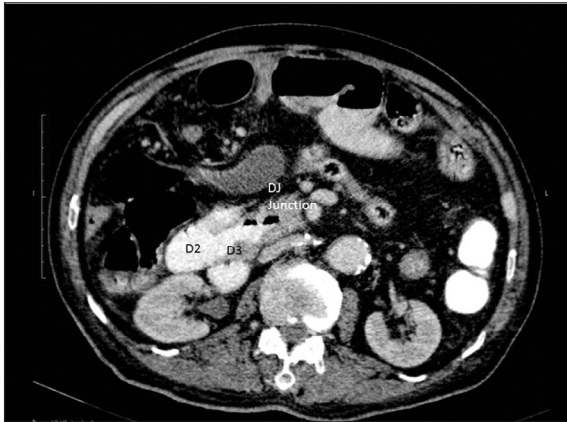
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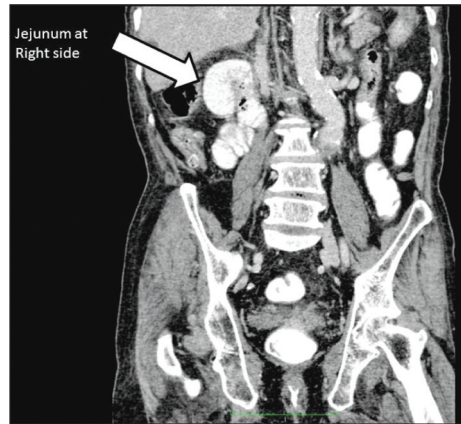
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**FIGURE 1:** Cross sectional contrast-enhanced computed tomography of the abdomen shows duodenojejunal junction located at the right side of the abdomen.



**FIGURE 2:** Coronal view of contrast-enhanced computed tomography of the abdomen shows the jejunum (arrow) originated at the right side.

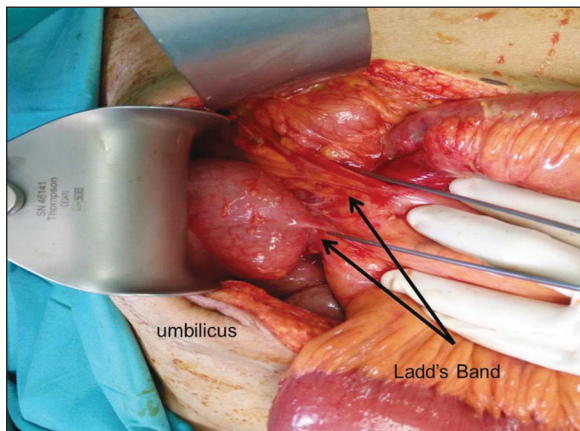
blood gas showed mild metabolic acidosis with borderline lactate level of 2.0.

A contrast-enhanced computed tomography (CECT) scan abdomen findings were small bowel malrotation by evidence of duodenojejunal (DJ) junction located at left side and jejunal originated from right side with suspected volvulus with concomitant gallbladder empyema (Figure 1, Figure 2). Based on the clinical presentations and supporting imaging findings, the patient was counselled for operative intervention. An exploratory laparotomy was carried out in which the intraoperative findings were perforated gallbladder empyema in addition to small bowel malrotation, Ladd’s band and midgut volvulus (Figure 3, Figure 4). The patient underwent

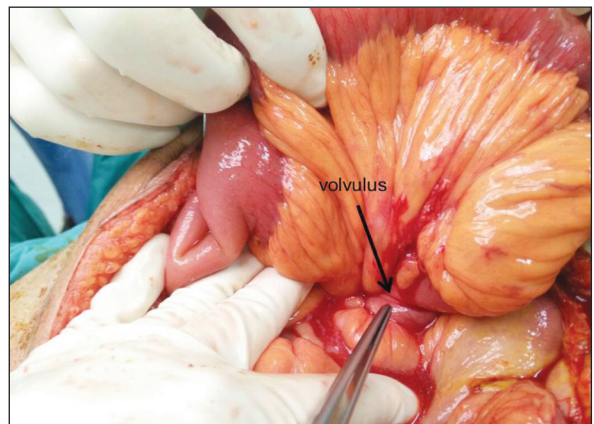
cholecystectomy, release of Ladd’s band, re-rotation of the bowel, fixation of caecum to the right lower quadrant and appendicectomy. The patient made a full recovery postoperatively and during the 3 months review, the symptoms of constipation and abdominal colic were significantly reduced. Informed consent was obtained from the patient.

## DISCUSSION

Midgut malrotation occurs due to anomaly of intestinal rotation and fixation, which occurs during fetal development. The rotation of intestinal development is divided into 3 stages. Stage 1 occurs between 5-10 weeks of gestational age. During this stage, there is extrusion of midgut into extraembryonic cavity to the



**FIGURE 3:** Intraoperative finding shows the presence of Ladd’s band and caecum located at the right hypochondriac.



**FIGURE 4:** Volvulus is seen after the release of Ladd’s band.

umbilical cord. The DJ loop begins superior to the right of the superior mesenteric artery (SMA) at a 90-degree position and rotates 180 degrees in a counterclockwise direction, and is thus located below the SMA. Simultaneously, the caecocolic loop begins at 270 degrees and rotates 90-degree counterclockwise and is located at anatomical left of the SMA (0 degree). In Stage 2 which occurs at 11 weeks of gestation, the bowel returns to the abdominal cavity. The DJ loop further rotates 90-degree to complete a 270-degree to end at the anatomical left of SMA while the caecocolic loops turn 180 degrees more to end at the anatomical right of the SMA. In Stage 3, which occurs from 11 weeks gestation until term, it involves fusion and anchoring of the mesentery and caecum fixed to the lateral abdominal wall by peritoneal band.<sup>1</sup>

Failure or deviation of the process stated above may expose a person to intestinal malrotation while the types of intestinal anomalies differ according to the defect occurred in each stage. Intestinal malrotation, for example, represents a Stage 2 defect.

Intestinal malrotation patients may present within the first month of life in 64-80% of patients.<sup>2,4</sup> However, a more recent study had shown that the incidence was increasingly diagnosed during adulthood in which a single institution study yielded the age of presentation in adults aged more than 18 years old was 48%.<sup>3</sup> While in the other series, the total malrotation incidence was 42% in adults.<sup>5</sup> Although there are reports that described the presentation during adulthood, it is very rare for the incidence to happen during this age.

In this case, a late detection of intestinal malrotation is due to the patient's being asymptomatic during early age and patient he was presented with concomitant gallbladder empyema. The disease per se was detected incidentally during CECT scan of the abdomen and was confirmed with intraoperative findings. The standard diagnostic imaging is gastrointestinal contrast series which yield high sensitivity and is the diagnostic methods in paediatrics.<sup>6,7</sup> However, in older patients who presented with acute symptoms, a CECT of the abdomen is a more superior option of imaging as it provides wider range of information. The CECT of the abdomen in this case

revealed the diagnosis of intestinal malrotation and concomitant gallbladder empyema enabled the operating surgeon to plan management options early. Thus, it avoids a true "exploratory" laparotomy which yields a less operating time and avoids unnecessary stress to the patient.

The classic treatment of intestinal malrotation is Ladd Procedure which includes detorsion of midgut volvulus, division of abnormal coloduodenal Ladd band, widening of mesenteric based and appendicectomy for its abnormal location. The principles have remained the same since it was introduced in 1936 by Dr Ladd. The recent development is doing the procedure laparoscopically instead of laparotomy.<sup>8</sup>

## CONCLUSION

The diagnosis of intestinal malrotation in the elderly is challenging due to its rarity. A high level of suspicion should be considered in patients presented with intermittent episodes of intestinal obstruction and chronic abdominal pain. The advent and use of computed tomography imaging are useful in a pre-operative diagnosis of patients presenting with confounding intestinal obstruction. The understanding of its various presentation, the use of imaging with significant necessity combined with precise decision of the treating surgeon may improve overall patient outcomes.

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### Conflict of Interest

*No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.*

### Authorship Contributions

*Idea/Concept: Razif Ismail, Lim Chen Hong, Andee Dzulkarnaen Zakaria; Writing the Article: Razif Ismail; Critical Review: Lim Chen Hong, Andee Dzulkarnaen Zakaria.*

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