



# A Case of Malrotation with Duodenal Obstruction Resulting from Ladd's Bands and a Preduodenal Portal Vein in A 23-Year-Old Lady

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## ABSTRACT

Cases of adults presenting with malrotation causing duodenal obstruction is not common and as such some surgeons operating on adults are not well acquainted with its presentation and management.

The case of a 23-year-old lady who developed recurrent abdominal pain and vomiting (which were mostly post-prandial) over the past 13 years with associated weight loss was retrospectively reviewed. Clinical features, diagnostic strategy, operative findings and outcome were reviewed.

A diagnosis of malrotation with duodenal obstruction was made following clinical evaluation and radiological imaging—contrast upper gastrointestinal series and abdominal ultrasound scan. Ladd's procedure was done for her, including release of Ladd's bands with separation of abnormal vessels compressing the duodenum anteriorly, broadening of the mesentery and prophylactic appendectomy; followed by return of the bowel in the position of non-rotation. The postoperative period was uneventful and she has maintained a progressive improvement in health.

This case highlights the need for a high index of suspicion of malrotation with duodenal obstruction as a possible presentation of acute abdomen amongst adults and the need for surgeons operating on adults to be abreast with the management.

## INTRODUCTION

Malrotation with associated duodenal obstruction is a commoner presentation of infants compared to adults.[1,2] A prevalence of 0.17 percent was observed amongst adults in a study carried out by Perez and Pickhardt.[3]

The gut undergoes a 270° counterclockwise rotation around the superior mesenteric vessels during physiologic herniation and return with fixation of the duodenojejunal loop to the left of the midline and the cecum in the right lower quadrant. Any variation in this rotation and fixation of the gut during development results in intestinal malrotation, which

could be intestinal nonrotation or incomplete rotation.[4,5]

Malrotation can present as either an acute or chronic process viz – Acute midgut volvulus, Chronic midgut volvulus, Acute duodenal obstruction, Chronic duodenal obstruction as well as Internal herniation. The typical age at diagnosis of Chronic duodenal obstruction ranges from infancy to preschool-age. The most common symptom is vomiting, which is usually bilious and intermittent abdominal pain (frequently diagnosed as colic). The patients may also have failure to thrive.[4]

Upper gastrointestinal contrast study is useful to confirm the diagnosis and Ladd procedure remains the cornerstone of treatment.[2,4,6]

### CASE REPORT:

A 23-year-old female undergraduate who has been experiencing recurrent upper abdominal pain and vomiting over the past 13 years presented to the general surgery clinic. The pain was majorly in the epigastric region, sharp and colicky, aggravated with meals, non-radiating, non-periodic, no relieving factors, no dyspepsia. Vomiting occurred 2 – 4 times a day mostly following feeds. It contained recently ingested food, about 100 – 300ml per episode, sometimes bilious but non projectile and no haematemesis. There was associated poor weight gain. Physical examination revealed a young lady who was underweight with epigastric fullness and the rest of the abdomen scaphoid. There was occasional visible peristalsis in the upper abdomen.

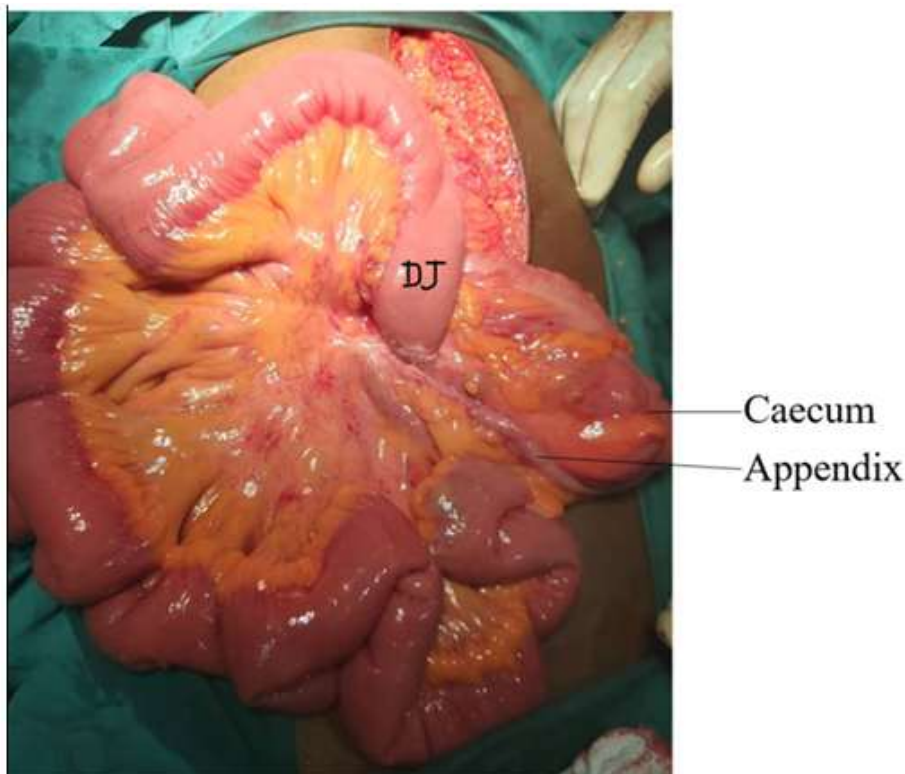
Barium meal done showed narrowing of the post bulbar portion of the 2nd part of the duodenum in the prone position only. While abdominal ultrasound scan revealed an anomalous vessel in the retroperitoneum around the duodenum and pancreas compressing the duodenum. A diagnosis of duodenal obstruction due to malrotation was considered and patient counselled for laparotomy.

Findings during surgery were:

- Freely mobile cecum located in the left paracolic gutter with an uninflamed appendix measuring about 10cm, figure 1.
- Collapsed small intestine disposed to the right paracolic area and abnormally located duodenojejunal junction.
- Dilated duodenum, up to the 3rd part, with anomalous vessels crossing the anterior aspect of that part, compressing adherently on the duodenum with a kink, figures 2 and 3.
- External Ladd's band holding the duodenum to the retroperitoneum.
- Other organs appeared normal and in their usual anatomic position

Release of Ladd's bands and abnormal vessels causing duodenal obstruction was done; as well as appendectomy. The bowel was then placed in the position of non-rotation.

The patient had a good recovery and was discharged on post operative day 6. She maintained a progressive improvement with weight gain on subsequent follow-up visits.



**Figure 1: Show the vermiform appendix and caecum located in the left upper quadrant of the peritoneal cavity close to the duodenojejunal junction**



A

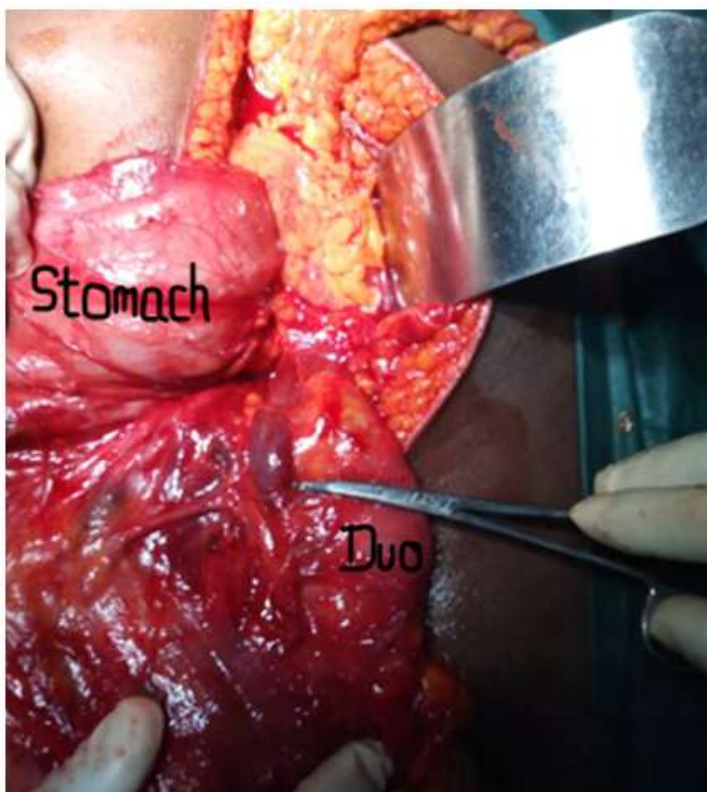


B

**Figure 2:**

**A shows a haemostat pointing at the point of narrowing of the duodenum by Ladd's bands.**

**B shows a haemostat pointing at the vessel which was compressing the duodenum being plastered by Ladd's bands.**



**Figure 3: Shows a haemostat pointing at the vessel which was compressing the duodenum being plastered by Ladd's bands which had been separated**



## DISCUSSION:

Malrotation cases sometimes are seen in adult patients, albeit the vast majority are observed in the first month of life.[1-3] Our index patient appeared to have been asymptomatic in childhood but started developing symptoms from early adolescence which progressed to adulthood. As demonstrated by this case, adult patients commonly present with vomiting and recurrent abdominal pain (often postprandial) as well as weight loss. [7,8] These symptoms are probably due to chronic partial upper intestinal obstruction. [9,10] Other presentations include early satiety with bloating, dyspepsia with peptic or duodenal ulcer disease, diarrhoea, malabsorption, peritonitis with septic shock, etc. [8] This condition might manifest as chronic nonspecific symptoms in some adults, making it difficult to establish a diagnosis. [11] Some of such patients become labelled with functional or psychiatric disorders and never get surgical referral. [12]

It is therefore of utmost importance to have a high index of suspicion and to endeavour to arrive at a specific diagnosis when adults present with nonspecific abdominal discomfort and chronic intermittent abdominal pain. Routine imaging studies with contrast has been shown to be very valuable in making diagnosis. [13] However, Sala et al in their study describe computed tomography scan as the method of choice for the diagnosis of malrotations [14]. Upper gastrointestinal barium studies and abdominal ultrasound scan were done for the index patient; and the combination provided a good pre-operative evaluation of the condition.

Ladd's procedure, first described in 1936, remains the mainstay of treatment regardless of age at presentation.[6] The procedure involves mobilization of the duodenum and right colon, division of coloduodenal adhesions (Ladd's bands) which may be sometimes near the superior mesentery, broadening of the mesenteric base to prevent volvulus but if volvulus is present counterclockwise reduction of the volvulus is done before widening of the mesenteric base to prevent repeated volvulus. Also, prophylactic appendectomy is done because of potential difficulty in diagnosing appendicitis in the future, since the appendix will now be in a location far from the normal anatomic location after the bowel is placed in the position of non-rotation. [15]. To be abreast with the Ladd's procedure, it is very important that surgeons operating on adults get thorough knowledge of intestinal embryology and its anatomic variations. In the index case, the assistance of a paediatric surgeon was required at the surgery.

For the index case, Ladd's bands were released and the abnormal vessels crossing anteriorly to the duodenum were separated from it. The mesentery was then broadened and prophylactic appendectomy done; there was no volvulus in this case. The bowel was eventually placed in the position of non-rotation as described by Ladd.

In conclusion, this case highlights the need for a high index of suspicion of malrotation with

chronic duodenal obstruction in adults presenting with recurrent abdominal pain and vomiting associated with weight loss. Also, there is the need for surgeons operating on adults to be very acquainted with the surgical procedure of treatment of such cases.

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