

**MIDGUT VOLVULUS SECONDARY TO INTESTINAL MALROTATION IN AN ADULT-  
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**ABSTRACT**

Midgut malrotation is a developmental anomaly characterised by embryonic bowel rotational and fixational abnormality, resulting in a narrow mesenteric root attachment.<sup>[1]</sup> We report a case of midgut volvulus in a 22 year old adult male with chronic non-specific symptoms so as to highlight the importance of maintaining a high index of suspicion in patients presenting with vague abdominal pain or discomfort for early assessment and management and prevention of surgical emergency.

**KEYWORDS:** case report, malrotation, adult, midgut volvulus.**INTRODUCTION**

Incidence of malrotation is estimated 1 in 6000 live births with 64–80% of malrotation cases presenting in the first month of life and 90% within the first year.<sup>[2]</sup> Malrotation is a rare cause of mechanical obstruction in adults accounting for 0.2–0.5% of cases, of which only 15% present with midgut volvulus which may manifest as an emergency condition or with chronic abdominal symptoms and is associated with a high risk of ischaemia leading to necrosis of bowel supplied by the SMA.<sup>[2,3]</sup>

We report a case of 22 year old male patient with chronic non-specific abdominal symptoms.

Informed consent was obtained from the patient.

**CASE REPORT**

A 22 year old male presented to the surgical out patient department with complaints of intermittent abdominal pain, nausea and multiple episodes of vomiting along with loss of appetite and weight loss.

His bowel and bladder habits were normal. There was no significant past medical or surgical history.

On examination, his vitals were normal. He had mild tenderness in epigastric region with no guarding or rigidity. Rest of the systemic examination and blood investigations were unremarkable.

Patient was advised contrast enhanced CT scan (oral and intravenous) which revealed wrapping of the mesentery and SMV around the SMA resulting in 'whirlpool sign', pathognomonic of midgut volvulus.

Correlation with ultrasonography of the abdomen on gray scale revealed rounded mass like structure in the epigastric region with reversal of normal superior mesenteric artery (SMA) and superior mesenteric vein (SMV) relationship such that the SMV lied to the left of the SMA.

Colour doppler ultrasound showed SMA in the centre with coiling of the SMV and the mesentery around it giving rise to the characteristic 'swirling sign'. Bowel appeared unremarkable with normal peristalsis. There were no enlarged lymph nodes and rest of the abdomen was unremarkable.



**Fig 1: Non-contrast axial CT showing centrally placed SMA with wrapping of the mesentery and SMV around it.**



**Fig 2: Contrast enhanced CT showing characteristic 'whirlpool sign' of midgut volvulus.**

## DISCUSSION

Intestinal Malrotation is a rotational anomaly of the bowel occurring during embryogenesis as the bowel elongates and herniates into the base of the umbilical

cord to undergo 270 degree counterclockwise rotation around the SMA axis.<sup>[2]</sup>

Normal intestinal rotation and fixation begins at 5th week of gestation, when the bowel enters the umbilical cord due to insufficient space inside the primitive celomic space. Eventually the intestines return back to the abdominal cavity during 10th week and the process is completed by 12th week of gestation.<sup>[3]</sup>

This intestinal rotation occurs in three stages - the first stage during 6 to 8 weeks where the intestines undergo 90 degree rotation; the second stage at 9 weeks where the intestines complete 180 degree rotation and the third stage by 12 weeks with completion of 270 degree rotation.<sup>[4]</sup>

Intestinal Malrotation is commonly diagnosed during the first year of life with adult presentation being rare.

Adult presentations can be divided into incidental, acute and chronic.<sup>[2]</sup> Incidental presentation is seen in asymptomatic patients garnering medical attention for some other medical condition.

Our patient presented with complaints of intermittent abdominal pain, nausea, vomiting, loss of appetite and weight loss with long monthly periods of complete remission in between.

Diagnosis is mainly by contrast enhanced computed tomography (CECT) of the abdomen however, upper gastrointestinal studies with barium meal follow through and ultrasound examination also provide diagnostic aid.

CECT abdomen shows the characteristic 'whirlpool sign' of midgut volvulus produced due to wrapping of the mesentery and the SMV around the SMA. Other findings include abnormal orientation of the mesenteric vessels and underdeveloped pancreatic uncinate process.<sup>[2]</sup>

The sonographic counterpart of the whirlpool sign is the 'swirling sign' seen on transverse orientation of the transducer in the epigastric region showing wrapping of the mesentery and the SMV around the SMA which is well seen with the help of colour doppler. (5) Other ultrasonography findings include reversed orientation of the SMA-SMV anatomical relationship with the SMA visualised to the left of SMV.<sup>[4]</sup>

Conventionally the diagnosis of malrotation can be made by upper gastrointestinal contrast studies. Patients with malrotation will show the duodeno-jejunal flexure(DJF) to the right of midline or below its normal position on the antero-posterior view. The pathognomonic feature is the 'cork-screw pattern' of the twisted duodenum and jejunum on upper GI series.<sup>[5]</sup>

The mainstay of treatment is surgery by Ladd's procedure which includes 4 steps: division of the Ladd's bands, widening of the narrow mesenteric root by mobilising the duodenum and division of adhesions

around SMA, counterclockwise detrotation of volvulus and appendectomy.<sup>[4]</sup>

## CONCLUSION

Midgut volvulus secondary to intestinal obstruction in an adult is rare and should be considered in patients with symptoms of intestinal obstruction as well as in patients with chronic non-specific symptoms to avoid delay in diagnosis, prevent complications and provide timely management.

## REFERENCES

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