International Surgery Journal
*Chatterjee D et al. Int Surg J. 2021 Jul;8(7):2231-2233*
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: https://dx.doi.org/10.18203/2349-2902.isj20212745

**Case Report**

# Intestinal malrotation with solitary jejunal diverticulum presenting as midgut volvulus in an adult: an unusual presentation

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**Received:** 10 May 2021
**Revised:** 10 June 2021
**Accepted:** 11 June 2021

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## ABSTRACT

Intestinal malrotation with midgut volvulus presenting in adults is a rare entity, and association with jejunal diverticulum is rarer still. Herein, we report and review such a case of malrotation and volvulus, associated with intestinal band adhesions and a solitary jejunal diverticulum. This 67 years old gentleman had presented with complaints of intermittent abdominal pain for past several years. Imaging of the abdomen revealed twisting of superior mesenteric artery and vein, evidence of midgut volvulus and intestinal malrotation with "whirlpool sign". Laparotomy revealed a midgut volvulus, extensive adhesions involving the root of the mesentery and a jejunal diverticulum. Adhesiolysis was performed, untwisting of the bowel was done and the jejunal diverticulum was resected. Post-operative period was uneventful. This case is being reported on account of its extreme rarity.

**Keywords:** Malrotation, Midgut volvulus, Adult, Adhesions, Jejunal diverticulum, Whirlpool sign

## INTRODUCTION

Intestinal malrotation with midgut volvulus presenting in adults is a rare finding.[1] Its association with jejunal diverticulum is an even rarer occurrence. Jejunal diverticula account for less than 0.5% of all small gut diverticula with an incidence between 1.3% and 4.6%, and are usually multiple.[2,3] A solitary diverticulum in the jejunum is a rare finding and has been theorized to be a risk factor for midgut volvulus.[2,4] Most adults present with non-specific symptoms like intermittent abdominal pain and constipation, often leading to a delayed diagnosis. The "whirlpool sign" of the mesentery seen on imaging is a classical finding of malrotation and midgut volvulus. Surgical intervention remains the mainstay of treatment.

Here we describe a similar case which was managed successfully at our centre.

## CASE REPORT

A 67 years old gentleman, presented with complaints of intermittent pain in the abdomen for past several years. The pain was mild in intensity, colicky, non-radiating and was usually at the central abdomen. It was not associated with vomiting or obstipation. He had no history of previous abdominal surgeries, and no other medical illness.

Clinical examination and blood investigations were unremarkable. Ultrasonogram (USG) of the abdomen showed presence of "whirlpool sign" and computerized tomogram (CT) showed the characteristic "swirl sign" (Figure 1). A provisional diagnosis of intestinal malrotation with midgut volvulus was made and the patient was taken for exploratory laparotomy.

Intraoperatively, the duodeno-jejunal flexure was seen in midline with extensive band adhesions in the mesentery of distal ileum (Figure 2), leading to twisting of the bowel loops (Figure 3). There was no evidence of vascular compromise of the bowel. There was a lack of mesenteric fat.

**Figure 1: Swirl sign on CT scan.**

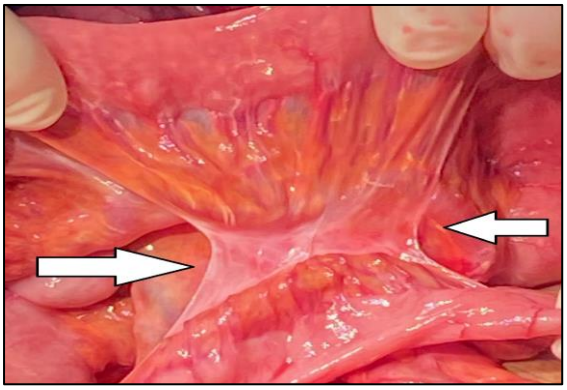

**Figure 2: Band adhesions in small bowel mesentery.**

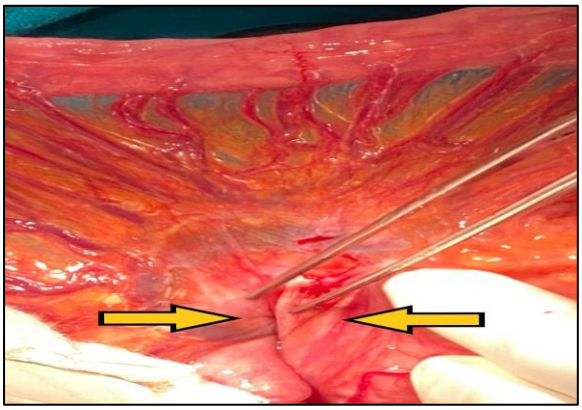

**Figure 3: Twisting of small bowel mesentery.**

The caecum and appendix were located in subhepatic position. A diverticulum of size approximately 4x3x2 cm was seen arising from the anti-mesenteric border of jejunum (Figure 4), about 45 cm from the duodeno-jejunal flexure. The adhesive bands were divided and ileum was derotated. Appendectomy was done to prevent future diagnostic dilemma. The jejunal diverticulum was resected. He was discharged after a post operative stay of 10 days.

He has been on follow up for last 3 months and has complete relief from pain.

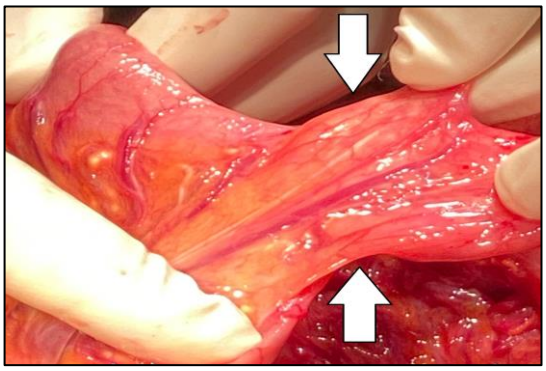

**Figure 4: Large solitary diverticulum on antemesenteric border of jejunum.**

## DISCUSSION

Intestinal malrotation is usually diagnosed in the neonatal period, while adult presentations are very rare with an incidence between 0.0001% and 0.19%.[1] There are about 92 adult cases of intestinal malrotation presenting acutely with midgut volvulus described in the published literature, with average age of presentation being 40 years old and a 1.7:1 ratio of male to female preponderance.[1] Jejunal diverticulum, a rare entity, accounts for less than 0.5% of all small gut diverticula.[2] Autopsy studies reveal an incidence between 1.3% and 4.6%, whereas radiologic studies show an incidence between 0.02% and 2.3%.[3] A solitary diverticulum in the jejunum is a rare finding and are usually associated with other small or large bowel diverticula.[2] The incidence of large diverticula (>3 cm) in the small bowel in patients with small bowel volvulus is as high as 35%.[4] The involved segment, which is filled with fluid and is heavier than the noninvolved part, might be responsible for initiating the volvulus.[5]

Most adults present with chronic symptoms like intermittent abdominal pain, bloating and vomiting, frequently in the postprandial period, usually lasting more than 6 months. The non-specific symptoms often lead to a delayed diagnosis.[6]

The “whirlpool sign” of the mesentery is seen on colour Doppler ultrasound and CT, which represent the swirling appearance of the mesentery and superior mesenteric vein around the superior mesenteric artery. The direction of swirl is clockwise on ultrasound and counter-clockwise on CT.

Early surgical intervention remains the best form of treatment for small bowel volvulus. Manually untwisting the volvulus may be sufficient if the bowel appears healthy

and viable. To avoid recurrence of the volvulus, intestinal fixation or appropriate resection of the intestine may also be conducted.[7]

In our patient, the cause for the midgut volvulus was determined to be the mesenteric band adhesions, hich is the most common cause.[4,7] The large jejunal diverticulum and the lack of mesenteric fat may have also contributed to the development of the volvulus.[4,7] This condition is more common among males and is typically found in the sixth or seventh decade of life, as was seen in our patient.[8] Histologically, it was determined to be congenital true diverticulum, consisting of all layers of the intestinal wall, including the muscular layer.

## CONCLUSION

We present a case of small bowel volvulus that may possibly be categorized as secondary type in view of the findings of one jejunal diverticulum and the diverticulum and the mesenteric adhesions. However the lack of mesenteric fat may have been a contributing factor in our case. When a patient with small bowel volvulus is asymptomatic, CT may be helpful for accurate and immediate diagnosis because they can demonstrate the rotated small bowel and mesentery, providing simultaneously, information for any associated intestinal ischemia. Surgical intervention is necessary for the treatment of midgut volvulus.

*Funding: No funding sources*
*Conflict of interest: None declared*
*Ethical approval: Not required*

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**Cite this article as:** Chatterjee D, Raul SK, Patras E. Intestinal malrotation with solitary jejunal diverticulum presenting as midgut volvulus in an adult: an unusual presentation. Int Surg J 2021;8:2231-3.