CASE REPORT

# Gastric volvulus and wandering spleen; a life-threatening surgical emergency

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## Abstract

Wandering spleen and gastric volvulus are two of the rarely encountered conditions occurring together with or without other congenital and acquired defects. These potentially fatal conditions originate from a shared cause, i.e. the defect of intraperitoneal ligaments resulting in a failure to withhold these organs at their anatomical position and alignment. This can come to attention in both childhood and/or adulthood, and the diagnosis calls for a high degree of suspicion and a failure to diagnose can culminate in death of both the organs, i.e. the spleen and stomach. We are presenting the case of a 20-year-old girl who underwent an emergency laparotomy for gastric volvulus and wandering spleen.

**Keywords:** Spleen, Volvulus, Surgery, Torsion.

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## Introduction

The occurrence of a combination volvulus of the stomach and a floating spleen produces a dreadful and a potentially lethal emergency event which arises due to the fact that both the conditions share a mutual origin of defect in their intraperitoneal visceral ligaments.[1-3] This abnormality in their attachment renders them excessively mobile; hence subjecting them to mal-positioning and twisting which can cause ischaemia and necrosis.[3]

## Case Report

A 20-year-old unmarried Pakistani girl presented to the emergency of Jinnah Postgraduate Medical Centre, Karachi, in November 2019 with severe abdominal pain in the epigastrium, along with abdominal swelling, constipation, and nausea for one day. She described the pain as dull and colicky. She had a history of similar episodes in the last four years which were sudden in onset, non-radiating, alleviating on their own or by nasogastric tube.

On examination, there was tenderness in the epigastrium. Bowel loops were palpable in the upper abdomen and gut sounds were sluggish. We were unable to insert a nasogastric tube. A chest and abdominal X-ray was done on admission, which was positive for gastric distension (Figure-1), air-fluid level and ground-glass appearance. Her diaphragmatic profile was normal. Abdominal ultrasound revealed dilated bowel loops occupying the splenic region and the spleen was noted to be occupying the lower medial abdomen. A plain and contrast-enhanced computed tomography scan showed the stomach remarkably distended with gas and fluid. There was displaced gastric antrum above the gastroesophageal (GE) junction and along with it one could see a moving spleen that was localised inferiorly near the left kidney. All abdominal organs were in usual healthy condition and size.

**Figure-1:** Dilated gastric shadow can be seen in the above X-ray.

She underwent an emergency open laparotomy. An organo-axial volvulus was observed and the spleen was discovered to be slightly enlarged and lacking any

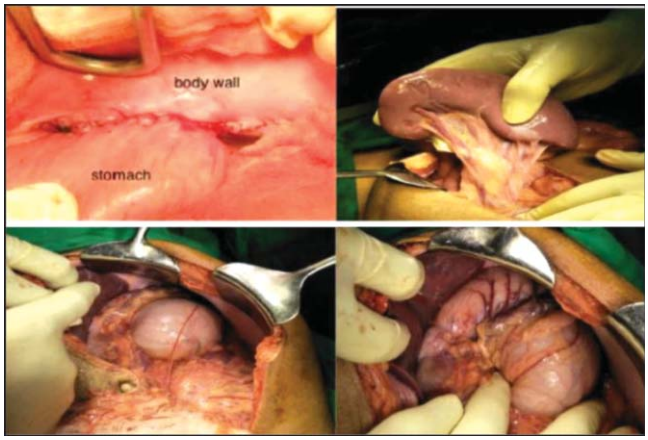


**Figure-2:** The figure shows gastropexy and splenopexy in process. A slightly enlarged spleen was seen without any ischeamic changes.

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ligamentous attachments. Exploration revealed gastric distension with flaccid gastric walls and a non-ischaemic spleen. After removing the adhesions from the stomach, a right-sided gastropexy between splenic flexure, hepatic flexure and abdominal wall was done (Figure-2). The spleen was placed back into its usual anatomical location. The stomach was sutured to the given peritoneal incision and concurrent splenopexy harboured both the organs in their suitable positions.

Her return to normal health was uneventful after the surgery and she was discharged on the fourth postoperative day. A follow-up abdominal sonography scan, a year after the surgery was satisfactory, showing a viable spleen in its correct anatomical position.

## Discussion

The rarity of gastric volvulus associated with a wandering spleen and its temporary clinical relief with medical management often delays the diagnosis and surgical treatment as was seen in this patient.[4]

Gastric volvulus, a surgical emergency, is known as the rotation of the stomach along its short or long axis culminating into a varying degree of obstruction in the gastric inlet and/or outlet. This rotation if of 180 degrees or greater can lead to strangulation, necrosis, and sometimes perforation as well.[5]

Categorisation of gastric volvulus is centred on the aetiology, primary or idiopathic (related with tumours, adhesions or some defect in the peritoneal attachments of the stomach) or secondary (related to dysfunction in gastric motility and structural abnormalities, or with disorders of the diaphragm and spleen) and the axis of rotation. The most widely approved classification of gastric volvulus was put forth by Singleton[5] which is centred on the axis of rotation.

Type I is organo-axial (OA) volvulus, which occurs in 59% of the cases; here the rotation occurs around the axis connecting the pylorus and cardio-oesophageal junction. Type II is mesenteroaxial (MA) volvulus which occurs in 29% of the cases; here the rotation takes place around the axis causing bisection of the greater and lesser curvature of the stomach. Type III occurs in 2% of the cases and is a fusion of both type I and II, whereas type IV, which makes up 10% of cases, is unclassified.[1]

Acute MA volvulus is very common in children and young adults; though, some reports state that in some cases it was also observed in the aged population.[6]

In most instances, gastric volvulus has a secondary cause like peptic ulcers, which causes retraction of the small curvature leading to MA axis rotation.[6] In adults, para-oesophageal hernia and diaphragmatic trauma can make the patient vulnerable to the development of a secondary gastric volvulus.[6] Though in our patient there was no secondary predisposing condition.

Along with some non-specific symptoms such as haematemesis and hiccups, gastric volvulus may present with the Borchardt's classical clinical triad which comprises severe epigastric pain, retching without vomiting, and an inability to pass a nasogastric tube.[2]

Supine X-ray of the abdomen shows a massively enlarged stomach with air bubble as was seen in the present case (Figure-1) and a double air-fluid level may be visible on an erect scan. Upper gastrointestinal fluoroscopy can help determine the type of the volvulus based on the axis of stomach rotation and the obstruction caused by it through the movement of ingested contrast material. Commuted tomography scan of the abdomen is also an effective modality for making a diagnosis of acute gastric volvulus, its convolution, and the associated predisposing conditions.[2]

The radiological and intra-operative findings in our patient showed displacement of the gastric antrum above the GE junction, due to dilatation of the stomach, bowel loops occupying the splenic region and a mobile spleen in the lower medial abdomen.

Treatment of gastric volvulus is based on decompressing the air bubble formed in the stomach; achieved by NG tube or upper GI endoscopy, reduction of the volvulus, contemporary anterior and fundal gastropexy, and managing the underlying predisposing causes in order to reduce the risk of re-herniation, gastroesophageal reflux; achieved by restoring angle of His, and for preventing volvulus recurrence.[3,7]

Wandering spleen is a condition of unusual occurrence caused due to anomalous formation of the peritoneal attachments anchoring the spleen, which renders it moveable to any part of the abdominal or pelvic cavity.[3]

The splenic silhouette may not be visible at its usual place on abdominal X-ray.[8,9] Abdominal sonography can demonstrate the wandering nature of the spleen, though occasionally its view could also be hampered by bowel gas.[9] A duplex study is sometimes useful to assess the blood flow to spleen and whether any splenic torsion is present or not.[9] CT scan can show the presence of gastric volvulus with it,[9] as was witnessed in our case.

If a healthy wandering spleen is discovered incidentally, splenopexy should be the procedure of choice due to a

high risk of torsion in future in asymptomatic individuals and to preserve the viable splenic tissue.[3,9]

A prophylactic gastropexy is justified in patients with wandering spleen since these two rare and potentially life-threatening conditions arise due to a mutual predisposing cause.[4,9]

Now more surgeons are utilising upper gastrointestinal endoscopy in an emergency setting for gastric decompression and reduction, and then opting for gastropexy and splenopexy in an elective setting laparoscopically in high-risk patients using this minimally invasive, safe and effective procedure with the same outcomes as laparotomy and decreased hospital stay.[3,4]

In our case, an emergency laparotomy had to be resorted to due to the non-availability of endoscopic equipment in our emergency theatre. The volvulus was recognised as the organo-axial type, fortunately both the stomach and the spleen were healthy and non-ischaemic and concomitantly gastropexy and splenopexy were performed to secure both the organs in their anatomical positions.

## Conclusion

Gastric volvulus and wandering spleen are two rare conditions that can occur both in children and in adults. They arise due to non-existent or ill-formed intraperitoneal suspensory ligaments that hold these organs in position. This deformity can lead to obstruction and/or rotation of the stomach and torsion of the spleen which is a surgical emergency. As it was proven through our case that it is important to keep a high suspicion for the possibility of this diagnosis that could have resulted in a potentially fatal outcome if ignored or not treated properly.

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