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Case Report

Primary gastric volvulus: a case report

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ABSTRACT

Gastric volvulus is a rare surgical emergency whereby rapid diagnosis and intervention is imperative to prevent morbidity and mortality. This case report discusses a 45-year-old woman, with no prior medical or surgical concerns, who presented to Thelle Mogoerane Regional Hospital in South Africa with an acute abdomen after bouts of vomiting and nausea, which prompted a computed tomography (CT) scan. The CT findings were suggestive of a gastric volvulus and the patient was optimised before successful surgical intervention was done. This case report highlights the importance of prompt diagnosis via multi-modal techniques and rapid surgical intervention.

Keywords: Gastric volvulus, Computed tomography, 180 degrees

INTRODUCTION

Gastric volvulus is a surgical emergency often presenting with vague signs and symptoms, making diagnosis and early intervention difficult. A complete gastric volvulus occurs when the stomach rotates at least 180 degrees along its own axis - either in the horizontal or longitudinal plane.[1]

Gastric volvulus can lead to a foregut obstruction causing several of the non-specific symptoms like vomiting and abdominal pain. The obstruction can rapidly progress to strangulation of the foregut resulting in perforation, necrosis, shock and mortality. The mortality rate has been shown to be as high as 50 percent thus making rapid diagnosis and treatment vital.[2]

Several radiological tools are helpful in diagnosis of gastric volvulus and are largely the diagnostic key in these presentations. A plain radiograph can show a double air bubble while fluoroscopy and computed tomography (CT) scan can delineate that obstruction more clearly.

Once diagnosis is made, rapid resuscitation and surgical intervention are life-saving measures drastically reducing morbidity and mortality.

CASE REPORT

A 45-year-old woman was referred from a district level hospital with a three-day history of nausea, vomiting and generalised abdominal pain. This was the first time this had occurred to her and she had no comorbidities or any previous surgeries. The vomit was described to be yellow and mucous-like. She had last passed stool one day prior to presentation.

On clinical assessment, the patient was alert and orientated with no signs of dehydration. She had a nasogastric tube in-situ placed by the referral hospital with bilious content on free drainage. Her vitals were stable and all within normal range with a presenting blood pressure of 126/72, pulse of 76 BPM, sats of 94% on room air, and a temperature reading of 36.4.

Her abdomen was grossly distended with hyperresonance on percussion. There was global tenderness but no peritonitis. No masses were felt on palpation. Rectal exam found there to be minimal dry stool in her rectum but no apparent masses. Her cardiovascular, respiratory, urogenital, and neurological systems were unremarkable. The decision was made to continue with free drainage via the nasogastric tube, IV fluids and analgesia and do an

abdominal and chest xray while awaiting a contrasted CT abdomen with the current leading differential being small bowel obstruction. Her presenting blood gas showed a hypokalaemic metabolic alkalosis (pH 7.51, potassium 3.1) in keeping with her one-day history of vomiting and signs of adequate compensation and rehydration with a normal base excess (1.1) and marginally elevated lactate (1.7). Her potassium was replaced with 20mmol potassium chloride in 200ml of normal saline while awaiting her CT scan. Her formal blood results throughout the duration of her admission are tabulated below (Table 1).

Table 1: Patient's blood results from admission to discharge.

Characteristics	16/10/25	18/10/25	20/10/25	23/10/25	28/10/25
Na^+ (mmol/l)	140	144	139	137	137
K^+ (mmmol/l)	3.0	3.2	3.5	3.6	3.6
Urea (mmol/l)	4.5	3.5	2.4	3.1	2.9
Creat (umol/l)	57	67	51	48	51
Wcc ($\times 10^9$/l)	13.46	16.25	8.80	11.94	8.53
Hb (g/dl)	13.6	13.8	11.6	12.2	12.1
Plt ($\times 10^9$/l)	181	188	164	203	241
CRP	100	272	163	156	30
PCT (ug/l)		0.09			
Ca^{2+} (mmol/l)		1.82	2.08	2.17	
Mg^{2+} (mmol/l)		0.93	0.75	0.68	
Phos (mmol/l)		1.22	1.15	0.97	
TP (g/l)	74		56		
Alb (g/l)	40		30		
TB (umol/l)	11		7		
CB (umol/l)	3		1		
Alt (U/l)	11		12		
Ast (U/l)	23		21		
Alp (U/l)	51		50		
GGT (U/l)	33		60		
Amy (U/l)	67				
Lip (U/l)	45				

Her inflammatory markers were raised on presentation but her remaining laboratory studies showed no signs of organ dysfunction with normal renal and liver function. Her immediate post-operative bloods show a significantly raised CRP likely due to a combined effect of inflammation and infective response but her septic markers lowered steadily over the following week.

Her haemoglobin, renal function, CMP, and LFTs remained within normal range throughout her admission. The imaging she underwent as part of her investigation and workup were vital contributing factors in her diagnosis and rapid intervention. Her abdominal X-ray showed a double air-fluid level and massively dilated stomach. Her CT abdomen was the key investigation in her diagnosis with it displaying classical signs of gastric volvulus.

The CT scan of her abdomen displayed a mesoentero-axial volvulus with signs of ischemia including pneumatosis of the gastric wall with poor enhancement. The CT scan displayed a clear picture of the volvulus in the mesoentero-axial plane with the stomach antrum being displaced above the gastroesophageal junction as indicated in the image below. There were no signs of a paraoesophageal hernia or any other associated conditions (Figure 1).

In light of her clinical presentation and the CT findings, the surgical team proceeded with an emergency exploratory laparotomy. Intra-operatively the team found a grossly distended stomach, necrosis of the greater curvature of the stomach, and gastric perforation but no intestinal perforation

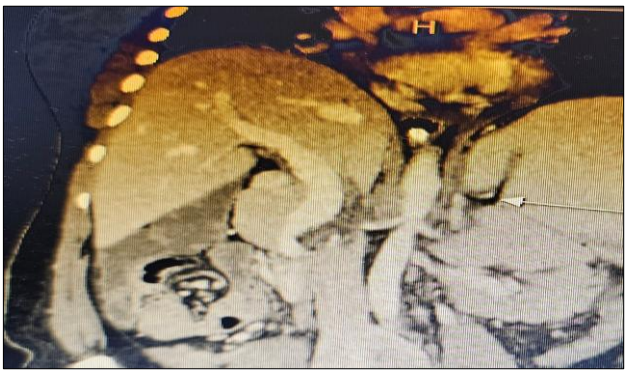

Figure 1: CT of the discussed patient showing gastric antrum above the gastrooesophageal junction.

The procedure was performed with open surgery and a midline incision was made. The stomach was decompressed via the nasogastric tube. The posterior wall

of the stomach was mobilized, explored, and debrided. Endo GIA stapler was used to perform a sleeve gastrectomy and gastropexy to the anterior abdominal wall was achieved. An extensive washout was done and pencil drain was left in-situ. The patient remained stable throughout the surgery and was transferred to the intensive care unit (ICU) thereafter and was initiated on total parenteral nutrition (TPN).

She recovered steadily with her immediate post-operative period in ICU. She remained with a nasogastric tube and continued TPN for 10 days post-operatively. Her biochemistry remained unremarkable. Ten days after the procedure she underwent a gastrografin meal and follow-through which showed no extravasation. She was then discharged and followed up one week and one month at the outpatient department where there were no signs or symptoms of concern.

DISCUSSION

Gastric volvulus is a relatively rare surgical emergency with a reported in both children and adults with the incidence steadily decreasing in adults in comparison to children. Gastric volvulus can be broadly classified into primary or secondary volvulus. Currently, it is believed that the majority of cases of gastric volvulus are secondary to another condition with the most common cause being a diaphragmatic hernia. The remaining minority of approximately 10 - 30 percent of cases are primary gastric volvulus whereby there is a laxity of the ligamentous attachments of the stomach allowing for greater movement of the stomach.[3] The clinical presentation is often vague with symptoms such as nausea and vomiting and Borchardt's Triad of vomiting, epigastric pain and inability to pass a NG tube is present in less than 70 percent of patients.[4] These non-specific symptoms make examination, clinical acumen, and radiological studies imperative. The three radiological modalities are plain xray, fluoroscopy, and CT scan. Erect radiographs can display a greatly distended stomach and often a double air-bubble sign. The signs seen on fluoroscopy are an “upside-down stomach” or tapering into a “bird’s beak” type of presentation. While there is value in radiographs and fluoroscopic studies, a contrasted CT scan reigns superior is identifying the axis of rotation, other concomitant pathologies such as paraoesophageal hernias or wandering spleens, as well as signs of ischemia and necrosis such as pneumatosis.[5] Gastric volvulus is often described according to its axis of rotation being either organo-axial or mesentero-axial. Organoaxial rotation is more common in adults with a prevalence of 67 percent while mesoentero-axial rotation is more common in children. The organo-axial rotation occurs when the stomach rotates along the horizontal plane and mesoentero-axial rotation around its short axis placing the antrum/pylorus above the gastroesophageal junction. Regardless of whether it is a primary or secondary volvulus or the orientation of rotation, if a patient becomes symptomatic, swift surgical intervention is warranted. There are no current guidelines on whether laparoscopic surgery or open surgery are recommended but it is clear that surgical approach needs to be tailored to the surgeon’s and the hospital’s capabilities.

CONCLUSION

This case report outlines the successful diagnosis and intervention of a primary mesoentero-axial gastric volvulus which highlights the need for prompt clinical and radiological diagnosis to aid with rapid resuscitation and surgical intervention. Due to its rarity, there is a gap in literature on clear guidelines on how to manage a primary gastric volvulus making ongoing research vital into their management.

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