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Gastric diverticulum causing gastric outlet obstruction in the setting of duodenal atresia

Devashis Mukherjee[a], Benjamin Sopczynski[b], Martin Espinosa[a,c], Pavan Brahmamdam[a,b,c,*]

[a] Beaumont Children's, Department of Pediatrics, 3601 13 Mile Rd, Royal Oak, MI 48073, USA
[b] Beaumont Hospital, Department of Surgery, 3601 13 Mile Rd, Royal Oak, MI 48073, USA
[c] Oakland University William Beaumont School of Medicine, 586 Pioneer Dr, Rochester, MI 48309, USA

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ABSTRACT

Duodenal obstruction due to duodenal atresia occurs in 1 in 10,000 live births and is the most common type of intestinal obstruction in neonates [1–3]. Gastric outlet obstruction in the newborn period from causes other than hypertrophic pyloric stenosis is very uncommon [3]. Potential etiologies include gastric volvulus, antral web, and duplication cysts. Gastric diverticula in the infant is even more rare, with only a few case reports published, and only one describes a gastric diverticulum in the presence of a duodenal atresia [4–8]. In this report, we describe the first case of a gastric outlet obstruction due to a gastric diverticulum in the presence of duodenal atresia.

Congenital gastrointestinal anomalies can be challenging and surprising to even the most seasoned pediatric surgeon [1–3]. Surgeons must be prepared to see something they have never seen before [3]. In this report we describe a unique presentation of an otherwise typical patient with duodenal atresia.

1. Case report

A female infant was born at 34 weeks and three days gestation to a woman of Middle Eastern descent. Pregnancy was complicated by maternal gestational diabetes and no prenatal ultrasound had been performed. Mother had premature rupture of membranes and the infant was delivered via spontaneous vaginal delivery. The infant was initially vigorous and Apgars of 9 and 9 at one and 5 min of life, respectively, were recorded. The infant was started on ampicillin and gentamicin due to maternal Group B strep, and these were discontinued after 48 h of negative blood cultures. The baby was started on intravenous fluids while oral feeds of breast milk and formula were gradually advanced. By day of life two, the infant had not passed meconium and the abdomen was distended, yet soft. She had two episodes of emesis of partially digested material. Feeds were stopped and an abdominal radiograph was obtained -which showed marked gastric distension and paucity of bowel gas throughout the rest of the abdomen. An orogastric tube was placed and an upper gastrointestinal series (UGI) with barium was performed. This showed contrast filling the stomach without any evidence of gastric emptying, and persistently absent bowel gas throughout the abdomen (Fig. 1). The lateral views demonstrated soft tissue fullness behind the stomach, which was displaced forward, with mass effect on the fundus and body of the stomach along with pooling of contrast along the posterior wall which was read as thickened folds or an ulcer. An ultrasound demonstrated a dilated fluid-filled proximal duodenal bulb, with collapse of the bowel at the second to third part of the duodenum suggesting presence of duodenal atresia. The baby was taken to surgery and intraoperatively, a dusky, ischemic structure that was contiguous with the stomach at the greater curve was found (Fig. 2A). The ischemic structure resembled a diverticulum that was along the greater curve extending to the gastroesophageal junction and esophagophrenic ligament. The diverticulum was incised, found to be communicating with the stomach lumen, composed of gastric mucosa, and was resected completely (Fig. 2B).

The proximal duodenum terminated in a bulbous end with an obvious interruption and atresia (Fig. 3). The distal duodenum was identified and a duodenotomy was performed. Using a red rubber catheter, normal saline was flushed into the distal duodenum and followed to the cecum, ruling out an intestinal atresia. A foley catheter was passed retrograde through the proximal duodenum into the stomach without any resistance. A double-diamond duodenoduodenostomy was performed for the duodenal atresia. A repeat UGI was done 7 days after the surgery which revealed no evidence of stricturing, obstruction, or extravasation of contrast. Feeds were then started and gradually advanced. The patient was tolerating full feeds by post-operative day 14, and was discharged in good condition on post-operative

* Corresponding author. 3535 W. Thirteen Mile Road, Suite 748, Royal Oak, MI 48073, USA.
E-mail address: pbrahmamdam@gmail.com (P. Brahmamdam).

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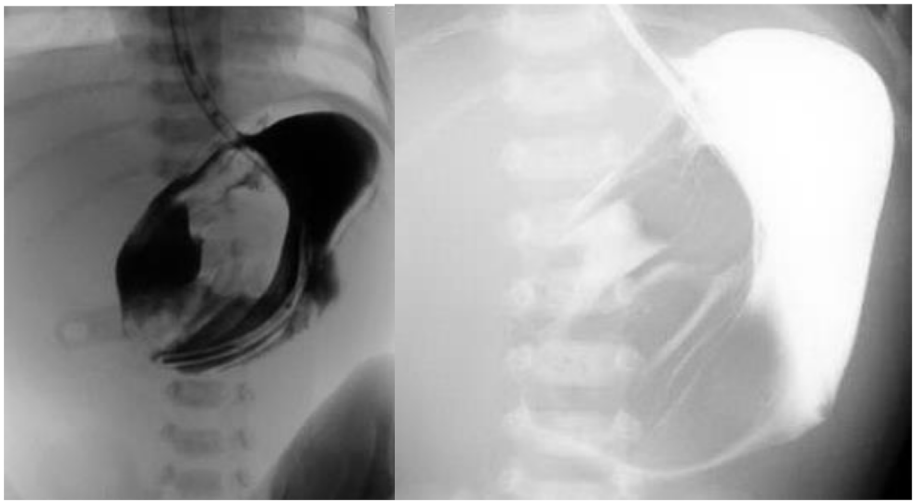

Fig. 1. Upper Gastrointestinal Series with Barium. Gastric diverticulum identified by pooling of contrast along the posterior wall evidenced by soft tissue fullness behind the stomach, which was displaced forward, with mass effect on the fundus and body of the stomach.

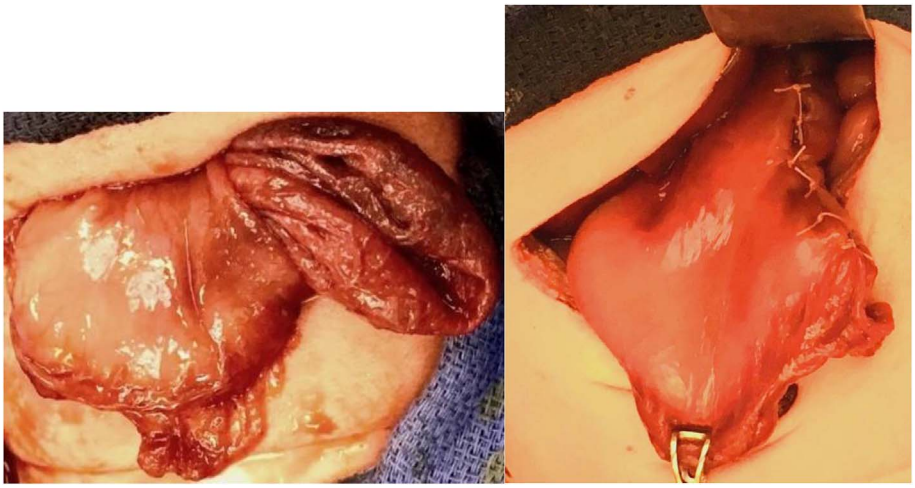

Fig. 2. (A) Gastric Diverticulum. Upon exploration the diverticulum appeared ischemic and was contiguous with the stomach at the greater curve, extending to the gastro-esophageal junction and esophago-phrenic ligament. (B) Resection of Gastric Diverticulum. The necrotic, ischemic diverticulum was resected and the stomach was closed in two layers, a running 4-0 PDS and then interrupted serosal lembert sutures with 4-0 Vicryl.

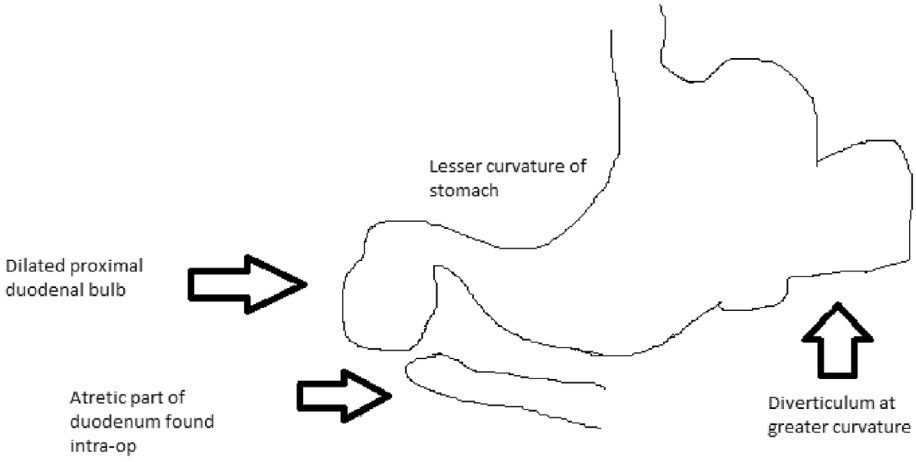

Fig. 3. Gastric diverticulum and duodenal atresia.

day 16. At last follow up at five months of age, she was doing well, growing well, and with no emesis or abdominal pain. Histopathologic analysis of the surgically resected tissue revealed it to be gastric mucosa and submucosa without muscle with marked ulceration and ischemic necrosis, consistent with gastric diverticulum.

2. Discussion

According to Ficarra [9], there are three types of gastric diverticula.

1. Congenital - all layers of the gastric wall were present.
2. Acquired: Some of the layers may or may not be missing, or be

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