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Delayed presentation of a duodenal web

Raed AlGhannam^a, Yasmin A. Yousef^{a,b,*}^a King Saud Bin Abdulaziz University for Health Sciences (KSAU-HS), College of Medicine-Jeddah (COM-J), Saudi Arabia^b King AbdulAziz Medical City - Jeddah (KAMC-Jd), Ministry of National Guard, Jeddah, Saudi Arabia

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ABSTRACT

Duodenal atresia and web are common causes of intestinal obstruction in early infancy. Their incidence ranges between 1 in 10,000 to 1 in 40,000 live births. Unlike duodenal atresia which is diagnosed early, even antenatally; A web presents later depending on the size of the aperture in the web. It usually presents with bilious or non bilious vomiting. We present an unusual presentation of duodenal web in a three and a half years old boy who presented with a 12 months history of abdominal distension and vomiting every 2nd or 3rd day. Plain abdominal imaging showed radiopaque foreign bodies below the diaphragm. As the natural history for majority of ingested foreign bodies is natural passage; He was managed expectantly elsewhere. Eventually, 12 months later, the patient presented to our center where further investigation provided the diagnosis. He was treated surgically by excision of the web. Post operatively, TPN and a trans-anastomotic tube (TAT) were used until full recovery was achieved. A high index of suspicion is the key to reaching the true diagnosis in patients presenting after the neonatal period.

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Duodenal atresia and duodenal web are reported causes of intestinal obstruction in children with an incidence that ranges between 1 in 10,000 to up to 40,000 live births [1]. Unlike the duodenal atresia which typically presents itself with the double bubble sign immediately after birth, perforated duodenal web may seldom remain undiagnosed until beyond infancy [2]. Presentation after the neonatal period may become a diagnostic challenge without a high index of suspicion. Webs and atresias occur due to failure of the duodenum to recanalize during the period of the 6th to the 8th weeks of gestation [3]. This abnormal process leaves behind a web made out of only the mucosa and the submucosa layers. The muscularis layer is absent [1].

1. Case report

We report a case of a three and a half year old male patient who presented to our emergency room complaining of progressive abdominal distention and various episodes of vomiting food contents every second or third day over the course of 12 months. The

patient was on fluid diet only. His abdominal distention was relieved partially by vomiting but was passing stool normally. The patient was born at full term and had no previous medical or surgical history.

Nine months prior to his presentation to us, the patient was seen in another hospital and had an abdominal X-ray which revealed 2 foreign bodies in the right hypochondrium. The family was reassured these foreign bodies would pass spontaneously. Later, he was scheduled for an endoscopy to retrieve the foreign bodies since the symptoms were not improving. The patient did not undergo the procedure.

On examination, patient's weight was 14.3 kg and his height was 94 cm, which was between the 15th and the 50th percentiles for both weight and height for age according to the WHO growth charts [4,5] and his other vital signs were stable. He looked well, oriented and not in distress. He had significant abdominal distention but no tenderness or organomegaly on palpation. His labs at presentation showed normal CBC but the MCV and MCH values were reduced and consistent with iron deficiency anemia. Other abnormalities included mildly decreased glucose levels at 3.2 mmol/L (N: 4.1–9.0 mmol/L), and low bicarbonate levels of 19 mmol/L (N: 20–28 mmol/L). Initial abdominal X-ray revealed a radio-opaque foreign body that appeared to be in the small bowel, no evidence of perforation was seen (see Fig. 1).

* Corresponding author. Department of Surgery, Pediatric Surgery Section, KAMC-Jd, P.O. Box 9515, Jeddah 21423, Saudi Arabia. Tel.: +966 2 2266666x22732. E-mail addresses: yousefya@ngha.med.sa, yamyousef@gmail.com (Y.A. Yousef).



Fig. 1. X-ray abdomen that shows hugely distended stomach with a radio-opaque foreign body that is projected over the right lumbar region measuring 12×10 mm that appeared to be in the small bowel but with no evidence of air-fluid levels suggesting perforation.

The patient was admitted as a partial intestinal obstruction. A barium enema was done to rule out Hirschsprung's disease and showed a normal caliber colon. A CT abdomen and pelvis with IV and oral contrast followed. It revealed a hugely distended stomach with multiple (around eight) foreign bodies that are most likely rosary beads. Distal to the second part of the duodenum the rest of the bowel was collapsed. Malrotation was ruled out (see Fig. 2A and B).

With a working diagnosis of a partial duodenal obstruction, the parents were counseled and the patient was prepared for operative exploration.

At laparotomy, normal rotation was found. Evidence of duodenal obstruction in the form of a huge duodenal bulb with distal collapse was found. The NG tube failed to pass beyond the duodenum. Duodenotomy revealed the windsock like web with a pin point hole in the center. The web was excised and the foreign bodies were retrieved. The foreign bodies were mostly rosary beads, dates seeds and a plastic piece that was thought to be a toy part (see Fig. 3).

Upon excising the web, however, the CBD and the ampulla of Vater were found to be right at the insertion of the web into the duodenal wall. Reconstruction of the ampulla was done around a 4 French stent after excision of the web. A nasogastric tube was used to decompress the stomach and a trans-anastomotic (nasojejunal) tube (TAT) was inserted through the other nostril for feeding. A peritoneal drain was left close to the duodenum for drainage.

The patient was admitted to PICU for pain control and observation for 24 h then he was discharged to the regular ward. He was well covered with triple antibiotics (Ampicillin, Gentamycin and Metronidazole). Proton pump inhibitor and Octreotide were also started to minimize his gastric, bile and enteric secretions.

The patient needed TPN for 10 days. A contrast study at day 8 post operatively ruled out any leak and showed a hold up in the duodenum where it changes caliber between the 1st and 2nd part with subsequent passage of contrast material to the jejunal loops.

Jujenal feeding was started through the TAT after the contrast study. TPN was weaned accordingly. On the 8th post-op day, antibiotics were ceased. Two days after that, the NG tube and the drain were removed, and the octreotide was stopped.

Oral feeds were started gradually on the tenth post-op day. Domperidone was started to help gastric motility. Surprisingly, he fully tolerated his oral feeds in 5 days, so, the TAT was removed and he was sent home. The pathology of the material sent was consistent with a duodenal web.

His first follow up visit was 1 month post discharge. He was doing well, tolerating his normal diet and had no vomiting episodes. He was vitally stable and his height was 95 cm and weighed 17.7 kg and (increased by 3.4 kg since discharge). Which put him above the 25th percentile for weight/age and above the 75th percentile for height/age according to the WHO growth charts [4,5].

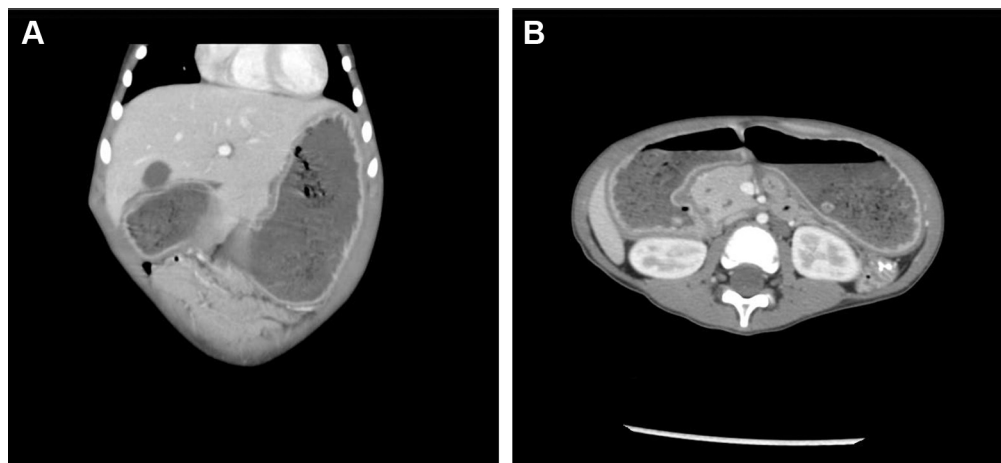


Fig. 2. A CT abdomen showing a hugely distended stomach in addition to multiple hyperdense structures seen within the stomach and 1st part of the duodenum the largest of which is measuring 1.8×1.4 cm, one of which was of a metallic density. A) Coronal cut B) Transverse cut.



Fig. 3. The retrieved foreign bodies (15 in total).

His second follow up was at 1 year post operatively and he showed sustained growth with his height and weight reaching 103 cm and 16.2 kg respectively.

2. Discussion

Congenital duodenal obstructions might be complete or partial and can be classified as either intrinsic or extrinsic. The intrinsic lesions include primarily duodenal atresia or web. While the extrinsic lesions include anterior portal vein, duodenal duplication, malrotation with Ladd's bands and annular pancreas [6]. Different age groups have different pathophysiological entities that lead to the unique symptomatology of the obstructive lesions. During infancy, common causes primarily include duodenal atresia and/or webs, hypertrophic pyloric stenosis occurs later around six weeks of age [3]. Duodenal webs may present later in infancy or childhood in contrast to atresias which can be diagnosed even antenatally due to the wide utilization of antenatal ultrasound.

A detailed history and careful clinical examination is the foundation of diagnosis. Confirmation is obtained through contrast radiography or endoscopy, the latter being more sensitive [7]. Nevertheless, a duodenal web may be missed if one fails to visualize the second and third parts of the duodenum on endoscopy [8].

The severity of partial obstruction caused by the web can vary with the degree of fenestration. Suspicion of a duodenal web should be raised when there is a distended stomach and duodenal bulb with partial transit of contents on contrast imaging. Most of the duodenal webs are located in the second part of the duodenum (85–90%), rare cases are reported beyond the second part.

One variant is a windsock deformity caused by a prolonged partial obstruction [9]. The ongoing peristalsis causes the membrane to prolapse distally leading to the formation of the windsock sign [10]. Our patient had an oblique insertion of the web with a small aperture at its distal end close to the posterior wall, where most of the foreign bodies accumulated.

Duodenal web symptoms are similar to those of malrotation, presenting with bilious vomiting as the commonest symptom [2]. Also, other symptoms like vague abdominal pain mostly in the epigastrium and the upper quadrants, abdominal distension, and post-prandial vomiting may be observed [9,11]. If the passage is only partially obstructed, reaching a diagnosis may be delayed into late childhood or even young adulthood [12].

Because most duodenal obstructions occur distal to the ampulla, the vomitus is bile-stained in more than two thirds of the cases [13]. Non bilious vomiting, however, can occur (like in our patient) when the ampulla of Vater is inserted distal to the web. Surgical resection

or bypass of the web has been the mainstay of treatment; however; endoscopic techniques are now similarly efficient [1].

The role of octreotide has been well established in the management of traumatic pancreatic injuries and resections and also in the management of entero-cutaneous fistulae. The early administration would result in a dramatic decrease in the secretion of the digestive enzymes, thus giving time for healing to occur. This in turn will shorten the need for postoperative TPN support [14,15]. Although octreotide use has not been reported in duodenotomy in the literature; we used octreotide in our case in hope that decreased GI secretions would expedite healing of the ampullary reconstruction.

Using TAT, with or without an NG tube, is also associated with reduction in duration of TPN use and in total hospital stay [16]. As there was an ampullary reconstruction in our case, we were reluctant to utilize TAT feeding before obtaining the contrast study.

Infants and preschoolers are known for ingesting foreign bodies. Uneventful passage is the natural outcome, with the exception of alkaline disc batteries and magnets which carry significant morbidity [17]. However, a foreign body that does not pass after an adequate period of observation should trigger further investigation to rule out a mechanical cause [18].

3. Conclusion

Although duodenal webs are not universally rare, delayed presentation becomes a diagnostic challenge as children beyond infancy are more likely to have an acquired pathology rather than a missed congenital lesion.

Inability to pass ingested foreign bodies after a reasonable period of observation should trigger further investigation to rule out a mechanical obstruction not previously detected.

From our experience with this case, we think that using octreotide may prove to have a role in expediting the healing of an ampullary injury via keeping the area relatively dry. Further studies are needed to confirm this statement. Also, insertion of TAT intra-operatively may aid with early initiation of enteric feeding and faster total GI recovery time.

Conflict of interest

None.

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