Case Report

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Website: www.afrjpaedsurg.org
DOI: 10.4103/0189-6725.78940
Quick Response Code:

Duodenal stenosis in a child

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ABSTRACT

We present a case of incomplete duodenal obstruction having a delayed presentation, making diagnosis and early intervention more challenging. Failure of recanalization of the duodenal lumen during the eighth to tenth week of gestation, results in duodenal atresia. Incomplete recanalization can lead to duodenal stenosis or the presence of a duodenal web. In the absence of other serious anomalies or prematurity, the overall survival for duodenal stenosis or atresia is nearly 100%.

Key words: Duodeno-duodenostomy, duodenal obstruction, duodenal stenosis

INTRODUCTION

Congenital intestinal obstructions can be classified as intrinsic (atresia, stenosis and web) or extrinsic (malrotation, Ladd's bands, annular pancreas, duplications and rarely, a preduodenal portal vein). Duodenal atresia and stenosis are rare causes of intestinal obstruction in the newborn; the prevalence of intrinsic duodenal obstruction (atresia, web, or severe stenosis) is 1:6,000.[1] Duodenal stenosis is relatively rare in comparison with duodenal atresia. Incomplete duodenal obstructions have a more varied and often delayed presentation, making diagnosis and early intervention more challenging, like in our case. These conditions can be easily mistaken for the much more common pyloric stenosis, infantile gastroesophageal reflux, metabolic abnormalities or intracranial pathology initially due to the recurrent, progressive nature of the vomiting. Apart from the routine open surgical options for the treatment of duodenal stenosis, newer options have becomeavailable in recent years like laparoscopic duodeno-duodenostomy for duodenal stenosis in neonates and image-guided balloon dilatation for membranous duodenal stenosis in children.[2,3] We report this case due to its rarity and varied delayed mode of presentation, and so it makes duodenal stenosis an important differential diagnosis in the mind of surgeons tackling intestinal obstruction in children.

CASE REPORT

A full-term 18-month-old male child presented with history of bilious vomiting after feeds intermittently and failure to thrive.

On examination, baby was dehydrated, malnourished and pale; abdomen was scaphoid and soft.

Blood investigations revealed anaemia, haemoglobin 7.5 gm%. Other routine laboratory investigations were within normal limits except for hypokalemia, 2.8 mEq/L. X-ray abdomen erect [Figure 1] showed hugely dilated stomach, two large air-fluid levels with gas present



Figure 1: X-ray abdomen erect showing hugely dilated stomach, two large air-fluid levels with gas present in distal bowel suggestive of partial obstruction at the duodeno-jejunal junction.

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in the distal bowel suggestive of partial obstruction at the duodeno-jejunal junction. Gastrogaffin study [Figure 2] revealed a hugely dilated stomach up to the third part of the duodenum; after 3 h, gastrogaffin was seen in the distal bowel. Preoperative gastro-duodenoscopy [Figure 3] was performed which revealed grossly dilated stomach and duodenum till the third part; and a small pinhead hole opening of approximately 2 mm diameter between the third and fourth part of the duodenum, suggestive of duodenal stenosis. No other associated anomalies were present.

After initial treatment with antibiotics, fluid resuscitation and correction of anaemia and hypokalemia, the patient underwent laparotomy with a preoperative diagnosis of duodenal stenosis.



Figure 2: Gastrogaffin study revealed hugely dilated stomach up to the third part of the duodenum; after 3 h, gastrogaffin was seen in the distal bowel.

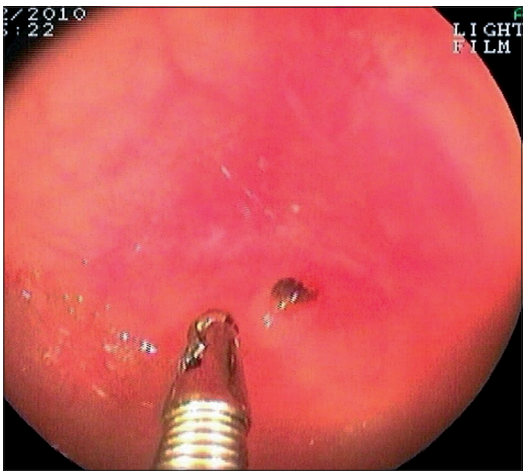


Figure 3: Preoperative gastro-duodenoscopy was performed which revealed grossly dilated stomach and duodenum till the third part; and a small pinhead hole opening, approximately 2 mm in diameter between the third and fourth part of the duodenum suggestive of duodenal stenosis.

On exploration, the stomach was grossly dilated and the duodenum till the third part. Kimura's diamond-shaped (proximal transverse to distal longitudinal) duodeno-duodenostomy was performed and the abdomen was closed in layers.

Postoperative period was uneventful.

DISCUSSION

Congenital obstruction of the duodenum (CDO) including duodenal atresia and stenosis occurs in approximately 1 in 6000 to 1 in 10,000 births.[4,5] Congenital duodenal obstruction is the result of several embryologic defects in foregut development, canalization or rotation. It still continues to present a unique management challenge. The diagnosis of duodenal stenosis may be delayed because these infants are able to tolerate small feedings due to the incomplete nature of obstruction. Duodenal atresia usually presents as a complete proximal bowel obstruction. In the present case having bilious nasogastric tube aspirate and distal small bowel gas levels on plain abdominal radiograph, intestinal malrotation must be excluded as the aetiology of the bilious emesis. Results of an upper gastrointestinal series showed a dilated proximal duodenum and contrast in the proximal jejunum in our case.

Duodenal atresia is diagnosed antenatally in up to 50% of cases, with polyhydramnios, dilatation of the stomach and proximal duodenum visible on the third trimester ultrasound. The radiographic sign of duodenal atresia is the "double bubble" with gaseous distension of the stomach and proximal duodenum and total absence of intestinal gas distally.[6] If small bowel gas is observed distal to the double bubble, the differential diagnosis includes duodenal stenosis, duodenal web and intestinal malrotation with midgut volvulus. In recent years, infants have been evaluated by fiberoptic flexible upper gastrointestinal endoscopy.[7] This allows the direct observation of anomalies in the duodenum such as duodenal stenosis, atresia and membrane or extrinsic compression. The initial management of any form of intestinal obstruction must include gastric decompression, fluid resuscitation and correction of electrolyte abnormalities, most commonly hypochloremic metabolic alkalosis.

Surgical exploration and repair may be safely deferred to allow gradual correction of markedly abnormal

electrolytes and fluid as in our case, as long as there is no concern of possible midgut volvulus. The preferred surgical repair of the primary anomaly is a diamond-shaped (proximal transverse to distal longitudinal) anastomosis. For the surgical treatment of congenital intrinsic duodenal obstruction Kimura, in 1977, introduced an anastomotic technique of side-to-side duodeno-duodenostomy in two layers, placing the bowel incisions to form a "diamond-shaped" (DSD) incision and created a larger stoma. In 1990, he refined his technique based on a transverse incision in the distal end of the proximal duodenum and a longitudinal incision in the distal duodenum. The double-layer anastomosis was completed using 5-0 or 6-0 catgut or Vicryl continuous inner and 6-0 silk interrupted outer layer sutures. No gastrostomy or transanastomotic tube was used. By this technique the anastomosis recovered its function in a significantly shorter time period and early postoperative feeding could be started.[8,9] If there is a duodenal web, it may be excised through a duodenotomy, taking great care to avoid injury to the ampulla.

The child responded well to the treatment and was discharged on a semi-solid diet.

In recent years, apart from the above-mentioned open procedures, laparoscopic duodeno-duodenostomy and image-guided balloon dilatation have been tried. These procedures have also resulted in successful outcome in duodenal stenosis. Laparoscopic duodeno-duodenostomy can be done in neonates with no intraoperative and postoperative complications; with the advantage of starting feeding at around 12 days, thereby resulting in short hospital stay. Image-guided balloon dilatation has also been tried in children with membranous duodenal stenosis. The procedure is done under general anaesthesia with standard angiography balloons passed per orally with diameters from 6 to 14 mm under image guidance. Similar to the laparoscopic procedure, image-guided balloon dilatation is also without any intra- or postoperative complications.[2,3]

We report this case due to its rarity and varied delayed mode of presentation, and so it makes duodenal stenosis an important differential diagnosis in the mind of surgeons tackling intestinal obstruction in children.

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Cite this article as: Kshirsagar AY, Sulhyan SR, Vasisth G, Nikam YP. Duodenal stenosis in a child. Afr J Paediatr Surg 2011;8:92-4.

Source of Support: Nil, **Conflict of Interest:** None declared.