

## Case Report

# Dual duodenal obstruction: an abdominal camouflage

Aravind RM\*, Sangara Narayanan Narayanasamy, Ganesh Babu Natesan,  
Rajeswari Subash B, Ravishankar KS

Department of General Surgery, Stanley Medical College Hospital, Chennai, Tamil Nadu, India

**Received:** 29 December 2014

**Accepted:** 23 January 2015

### \*Correspondence:

Dr. Aravind RM,  
E-mail: aravidoc@gmail.com

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

## ABSTRACT

Congenital Double Duodenal Obstruction (DDO) is a clinical entity with a combination of annular pancreas and distal duodenal obstruction (either due to duodenal membrane or atresia). Hereby reporting a case of double duodenal obstruction in a 7 years boy, confirmed by barium meal, CECT abdomen and MRI abdomen. Bile-stained vomitus in neonates is the typical presentation of atresia or severe stenosis. Minimal duodenal obstruction in mild stenosis or membrane may present with clinical features, which include polyhydramnios, low birth weight, feeding intolerance, vomiting, failure to thrive, epigastric distension and visible gastric peristalsis. Duodeno-duodenostomy is the surgery of choice in cases of duodenal obstruction due to atresia, diaphragm and annular pancreas. The morbidity and mortality rate of patients with congenital duodenal obstruction is very high. Effective measures such as early diagnosis and intervention, proper preoperative preparation, nutritional support are urgently needed to improve the outcome. Low birth weight and prematurity significantly affect the outcome, associated anomalies account for most of the morbidity and mortality and early diagnosis result in better outcome.

**Keywords:** Double duodenal obstruction, Duodenal membrane, Annular pancreas, Duodeno-duodenostomy

## INTRODUCTION

Congenital Double Duodenal Obstruction (DDO) is a clinical entity with a combination of annular pancreas and distal duodenal obstruction (either due to duodenal membrane or atresia). Annular pancreas is a condition in which the second part of the duodenum is surrounded by a ring of pancreatic tissue. Annular pancreas with duodenal membrane is a very rare association with only six cases being reported in literature.

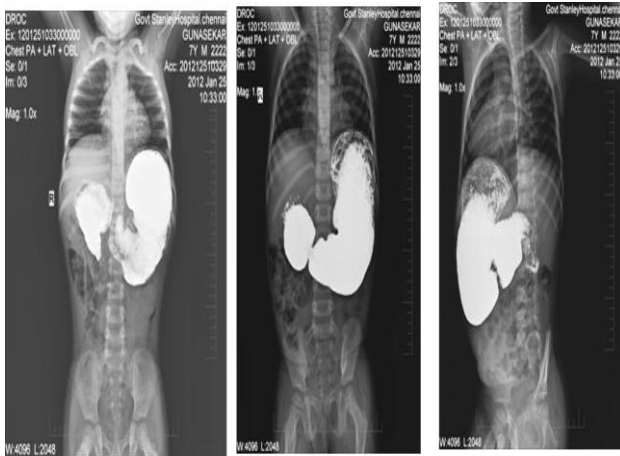
## CASE REPORT

A 7 years male child, brought by his mother with the history of bilious vomiting of 6 months duration, associated with upper abdomen pain since 1 month. He also gave history of ball rolling movements. He gave no

history of hematemesis, jaundice, fever, abdomen distension, melena or trauma. He was 2<sup>nd</sup> born child of a full term normal vaginal delivery with uneventful post natal period. Child's elder sibling was normal. Examination revealed short statured child with dysmorphic facies and developmental delay. His systemic examinations were unremarkable except for some dehydration. Abdomen examination revealed visible peristalsis in the epigastrium with no mass or organomegaly. All of his blood investigations were within normal limits. Barium meal showed a dilated stomach with a membrane at the D2-D3 junction (Figure 1). CECT & MRI abdomen (Figure 2 and 3) confirmed the same along with a thin rim of annular pancreas.

The child was diagnosed to have a duodenal membrane, D2 D3 region with annular pancreas and was planned for exploratory laparotomy. By right transverse incision

abdomen opened in layers showing multiple bands extending from the liver to the omentum, stomach and duodenum. A line of demarcation (dilated vs. normal duodenum) was present beyond the pancreatic ring. Duodenal membrane was present at D2-D3 region distal to the annular pancreas (Figure 4 and 5). The membrane was excised. Duodeno-duodenostomy was done to bypass the annular pancreas. Haemostasis was secured and wound was closed in layers. Post-operative period was uneventful and the child was discharged home on 15<sup>th</sup> post-operative day and was referred to a tertiary centre for further management.



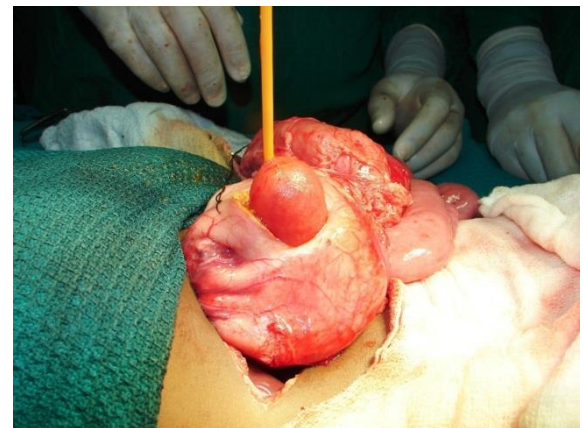
**Figure 1: Barium swallow showing duodenal obstruction.**



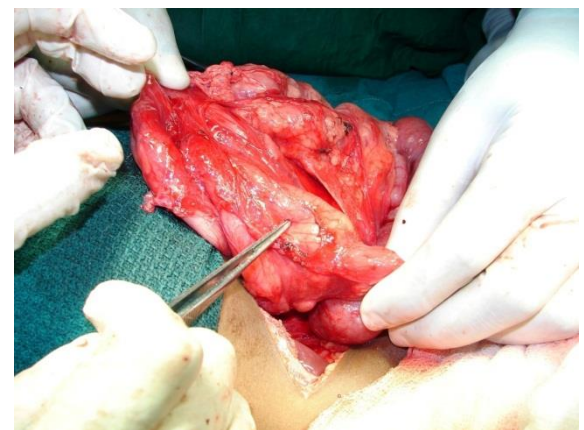
**Figure 2: CECT abdomen showing duodenal membrane.**



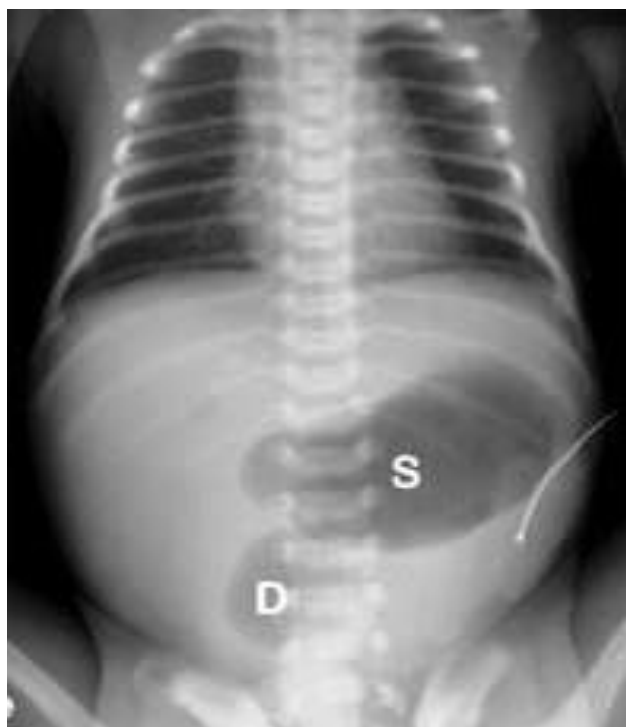
**Figure 3: MRI abdomen showing duodenal obstruction with annular pancreas.**



**Figure 4: Intraoperative picture showing duodenal membrane.**



**Figure 5: Intraoperative picture showing annular pancreas.**



**Figure 6: X-ray abdomen showing double bubble sign.**

## DISCUSSION

Neonatal duodenal obstruction is quite rare and its incidence has been estimated as 1 in 10000 to 1 in 40000 births.<sup>1,2</sup> Duodenal obstruction may be either partial or complete and extrinsic or intrinsic. Congenital duodenal obstruction may be associated with other GI and biliary tract abnormalities, or may be syndromic (VACTERL) (vertebral, anal, cardiac, tracheal, oesophageal, renal, and limb) or down's syndrome.<sup>2</sup> Approximately 40% of the atresia are found in the duodenum, 35% in the ileum and 25% in the jejunum.<sup>2</sup> Partial obstruction may be caused by intrinsic factors like diaphragm or a mucosal web, which are limited to the first and second part of the duodenum, the most common site being just at the ampulla.<sup>2</sup> Depending on the size of the opening, they may be diagnosed only later in childhood. Partial obstruction may also be caused by an extrinsic narrowing of the duodenal lumen by mesenteric bands in association with malrotation, or by an annular pancreas.<sup>3,4</sup>

Congenital duodenal obstruction by pyloric membrane was first reported by Calder in 1733<sup>2,5</sup> and by duodenal atresia by Crosby-Leonard in 1856 in London.<sup>6</sup> Jimenez and his colleagues conducted a thorough review of the literature, and found only 5 series of with 50 paediatric patients with annular pancreas since 1950. An annular pancreas is almost always associated with duodenal atresia.<sup>7</sup>

Bile-stained vomitus in neonates is the typical presentation of atresia or severe stenosis. Minimal duodenal obstruction in mild stenosis or membrane may

present with clinical features, which include polyhydramnios, feeding intolerance, vomiting, failure to thrive, epigastric distension and visible gastric peristalsis. Plain radiographs demonstrate the double-bubble appearance with no distal gas is the characteristic of duodenal atresia. The double-bubble sign represents dilatation of the stomach and duodenum (Figure 6). Occasionally, barium enema examination supplements the evaluation of duodenal atresia.

Duodeno-duodenostomy is the surgery of choice in cases of duodenal obstruction due to atresia, diaphragm and annular pancreas. Weber and his colleagues compared different surgical techniques in the treatment of duodenal atresia which includes duodeno-duodenostomy, duodeno-jejunostomy and gastro-jejunostomy and suggested better results with diamond shaped duodeno-duodenostomy.<sup>8</sup> In 1944, Gross and Chisholm<sup>9</sup> reported first successful operation of duodenal by-pass instead of releasing the annulus around the pancreas in a 3 days old girl with annular pancreas.

## CONCLUSION

The morbidity and mortality rate of patients with congenital duodenal obstruction is very high. Effective measures such as early diagnosis and intervention, proper preoperative preparation, nutritional support are urgently needed to improve the outcome. Low birth weight and prematurity significantly affect the outcome, associated anomalies account for most of the morbidity and mortality and early diagnosis result in better outcome.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: Not required*

## REFERENCES

1. Nixon HH, Tawes R. Etiology and treatment of small intestinal atresia. *Surgery*. 1971;69:41-51.
2. Schnauffer L. Duodenal atresia, stenosis and annular pancreas. In: Welch KJ, Randolph JG, Ravitch MM, eds. *Pediatric Surgery*. 4th ed. Chicago: Year Book Medical; 1991: 829-837.
3. Mehall JR1, Chandler JC, Mehall RL, Jackson RJ, Wagner CW, Smith SD. Management of typical and atypical intestinal malrotation. *J Pediatr Surg*. 2002;37:1169-72.
4. Rescorla FJ, Grosfeld JL. Anomalies of rotation and fixation. *Surgery*. 1990;108:710-5.
5. Irving IM, Rickham PP. Duodenal atresia and stenosis; annular pancreas. In: Rickham PP, Lister J, Irving IM eds. *Neonatal Surgery*. 2nd ed. Boston: Butterworth; 1978: 355-370.
6. Theremin E. Ueber congenitale Occlusionen des Dnndarms. *Deutsche Zeitschrift für Chirurgie*. 1877;1:34-71.
7. Irving IM, Rickham PP. Duodenal atresia and stenosis: annular pancreas. In: Lister J, Irving IM,

eds. Neonatal Surgery. 3rd ed. Stoneham, MA: Butterworths; 1990: 424-441.

8. Weber TR, Lewis JE, Mooney D, Connors R. Duodenal atresia: a comparison of techniques of repair. *J Pediatr Surg.* 1986;21:1133-6.
9. Gross RE, Chisholm TC. Annular pancreas producing duodenal obstruction. *Ann Surg.* 1944;119:759-69.

DOI: 10.5455/2349-3291.ijcp20150211

**Cite this article as:** Aravind RM, Narayanasamy SN, Natesan GB, Rajeswari Subash B, Ravishankar KS. Dual duodenal obstruction: an abdominal camouflage. *Int J Contemp Pediatr* 2015;2:46-9.