

Colonic Atresia: An Unusual Cause of Intestinal Obstruction in a Neonate

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Citation

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Abstract

Intestinal obstruction in a neonate is not an uncommon problem. However, intestinal obstruction due to colonic atresia is rare. We present a case of colonic atresia, which was suspected on antenatal ultrasound and radiological investigations on day one of life, and was proved subsequently at surgery and histopathology.

Name of the department and institution or hospital where the work was done – M G M Medical College, Indore, MP

INTRODUCTION

Intestinal obstruction due to colonic atresia is rare, with incidence of 5 – 15 % of all intestinal atresias.^{1,2} They usually result from an intra-uterine vascular insult^{1,3,4} and is found proximal to splenic flexure.⁵ On antenatal ultrasound, this condition may manifest as multiple echo free areas, corresponding to dilated bowel loops or as an isolated dilation of colon. On plain radiograph, diagnosis is usually suspected by the presence of air distended bowel loops, multiple air-fluid levels and absence of air in the rectum. Contrast enema confirms the diagnosis.

CASE REPORT

A one day old male child, weighing 3.2 kilograms, presented with progressive abdominal distension. The child had not passed meconium till 12 hours of life. On examination, the child was irritable, with excessive crying. General physical examination did not reveal any pallor, icterus or lymphadenopathy. Pulse rate was 124/minute, respiratory rate 32/minute, and blood pressure 74/60 mm of Hg. Abdominal examination revealed distended abdomen, with increased peristaltic activity, however no mass was palpable. There was no organomegaly. Per rectal examination revealed empty rectum. Chest, cardiovascular and neurological examinations were unremarkable.

The child was born at term and had normal uncomplicated vaginal delivery. Antenatal ultrasound at 35 weeks demonstrated multiple echo-free areas, corresponding to

loops of dilated bowel (Figure-1) suggesting bowel obstruction. Differential diagnosis of small bowel atresia, meconium plug syndrome and hirschsprung's disease was considered.

Figure 1

Figure 1: Antenatal ultrasound performed at 35 weeks of gestation reveals multiple dilated bowel loops.



Plain abdominal radiograph, at day one of life, showed multiple air filled distended bowel loops, almost occupying whole of abdomen, with a prominent loop of disproportionately dilated bowel, in the distribution of colon.

No gas was seen in the rectum (Figure-2) – findings were suggestive of large bowel obstruction. Subsequent contrast enema (Figure- 3), performed on same day (day one of life) with water soluble non-ionic contrast, revealed reduced caliber of the sigmoid and distal descending colon, beyond which contrast failed to pass proximally. There was complete cut-off of the colon contrast column. Radiological findings were consistent with colonic atresia.

Figure 2

Figure 2: Abdominal radiograph performed at day one of life, shows multiple air filled distended bowel loops suggestive of bowel obstruction. Also note the focally dilated segment of bowel (arrow) in the left hypochondrium.



Figure 3

Figure 3: Contrast enema reveals micro colon (arrow) with “cut-off” of the contrast column at the level of descending colon, findings are characteristic for colonic atresia.



The neonate was operated on second day of life, which revealed atretic cord like segment of descending colon from splenic flexure till sigmoid colon, thereby proving this as a case of “Colonic Atresia”. The atretic segment was resected and colo-colic anastomosis was established.

Histopathological examination of resected segment of colon did not reveal absence of ganglion cells ruling out association of hirschsprung's disease. Post operative course was uneventful and the child is doing well.

DISCUSSION

Colonic obstruction in neonate can be due to (a) dysmotility states (meconium plug syndrome, small left colon syndrome), (b) Hirschsprung's disease, and (c) Colonic atresia.^{1,2,6} Colonic atresias are rare, accounting only 5-15% of intestinal atresias with incidence of 1:40,000 live births.

^{1,2,3,4,6,7} They are believed to result from an intrauterine

vascular insult.^{1,4,6} Up to 75% colonic atresias are found proximal to splenic flexure usually in the ascending colon with significant amount of colon missing in most infants.⁵ This is commonly associated with other anomalies of gastrointestinal tract in 1/3rd of infants.^{4,6,8} The lesions are similar to those of small bowel atresias and classified by Louw as: Type I- One or more septa or diaphragms completely occlude the lumen. Type II- Proximal and distal ends are joined by a thread like structure. There may/not be associated with mesenteric defect. Type III- Proximal and distal blind ends are completely separated. The adjoining mesentery has V-shaped defect.⁹

Antenatal diagnosis of colonic atresia is difficult, though dilated bowel loops may be seen as multiple echo-free areas, in foetal abdomen on sonographic examination.⁷ Colonic atresia unlike small bowel atresias are not associated with polyhydramnios.^{3,7} Precise antenatal diagnosis of colonic atresia (middle transverse colon) has been reported where progressive dilation of transverse colon was demonstrated.¹⁰ Usually colonic diameter increases from 7mm at 25 weeks to 18 mm at term. Any colonic diameter more than upper limit of normal and more importantly demonstration of progressive dilation can clinch a possible diagnosis of colonic atresia, provided there is only segment dilation of pre-atretic colon.¹⁰ In our case there was non-specific dilation of bowel loops hence the diagnosis of colonic atresia was not considered. Plain radiographs are usually non-specific and show features of low intestinal obstruction in form of dilated bowel loops, multiple air-fluid levels and absence of air in rectum. In some patients however a disproportionately large dilated loop of bowel may be present, and render the plain abdominal radiograph highly suggestive of diagnosis.⁶ The diagnosis is confirmed at contrast enema and is study of choice.^{3,4,6,10} A water soluble agent, preferably non-ionic, is recommended because of increased colonic rupture in patients with atresia.³ The colon distal to atresia shows micro colon with failure of retrograde

flow of contrast. The contrast column ends abruptly and may taper or have a rounded "Cobra head" or Club deformity if membrane is present.^{1,4,6,7} A characteristic "hook sign" may be seen in post atretic segment in type III colonic atresia, where an associated mesenteric defect is present.¹¹

To conclude, colonic atresia although uncommon, should be considered as a possible differential diagnosis, in a neonate presenting with progressive abdominal distension and intestinal obstruction.

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References

1. Caffey John. Paediatric X-ray Diagnosis. Year Book; Edi. VII; Vol I: 789-91; Vol II: 1762.
2. Nyburg DA. Intra-abdominal abnormalities In: Nyburg DA, Mahony BS, Pretorius DH. Diagnostic ultrasound of fetal anomalies: text and atlas. Year Book Medical Publishers, Chicago (1990): 342.
3. Gore RM, Levine MS, Laufer I. Text Book of Gastrointestinal Radiology. Saunders 1994. Vol. 1: 1406-1417.
4. Grainger RG, Allison D, Adam A, Dixon AK. Diagnostic Radiology; Churchill Livingstone; Edi. 4, Vol. 2: 1208-1213.
5. Winters WD, Weinberger E, Hatch EI. Atresia of the colon in neonates. Radiographic findings. Am J Roentgenol 1992; 159(6): 1273-1276.
6. Hernanz-Schulman M. The Radiological Clinics of North America; Saunders Philadelphia; Nov. 1999, Vol. 37, No.6: 1175-85.
7. Rumack CM, Wilson SR, Charboneau JW. Diagnostic Ultrasound; Edi. II, Vol. II: 1085-1087.
8. Sharma SB, Gupta V, Sharma V. Hirschsprung's disease complicating colonic atresia. Indian J Pediatr 2004;71:445-6
9. Louw JH: Congenital intestinal atresia and stenosis in the newborn: observations on its pathogenesis and treatment. Ann R Coll Surg Engl 25:209-234, 1959
10. Anderson N, Malpas T, Robertson R. Prenatal diagnosis of colon atresia. Pediatr Radiol 1993. 23:63-64
11. Albert CS, Juda ZJ. The Hook Sign in Type 3 Congenital Colonic Atresia. Am J Roentgenol 1978.131:350-351.

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