CASE REPORT

Extrinsic colonic obstruction by congenital fibrous band in an infant

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SUMMARY

The finding of a congenital fibrous band during laparotomy for intestinal obstruction is extremely rare. Preoperative diagnosis is challenging and no characteristic radiological findings have been described. We report the case of a premature baby in whom incomplete intestinal obstruction was due to a congenital band originating from the duodeno-jejunal flexure and extending across the ascending colon.

BACKGROUND

Intestinal obstruction in newborns may be due to a variety of conditions such as intestinal atresia, malrotation, meconium ileus, Hirschsprung disease and other rare causes.¹ These conditions are symptomatic during the neonatal period presenting with bilious vomiting, feeding intolerance and difficulty in passing meconium or constipation. The mode of presentation can be acute, in case of complete obstruction or atresia, or chronic in case of recurring bouts of obstruction due to an incomplete obstruction.¹⁻³ In the rare case of an obstruction due to a congenital band the patient may be symptomatic at birth or symptoms may not develop until well into infancy.⁴⁻⁸ To date only few cases of colonic obstruction caused by a congenital band have been reported, but none in a preterm baby. We report the case of a premature baby with recurrent abdominal distension due to a congenital peritoneal band obstructing the ascending colon.

CASE PRESENTATION

A 30-week gestation, 900 g male was born by a caesarean section following a pregnancy complicated by maternal pre-eclampsia, maternal vaginal infection by *Candida* and intrauterine growth retardation. No intestinal abnormalities were detected at prenatal ultrasonography. Apgar scores were 8 and 9 at 1 and 5 min, respectively; physical examination was negative at birth; meconium was passed within the first 24 h.

During the first few days of life, the patient presented bouts of abdominal distension that resolved spontaneously, resulting in feeding intolerance; these episodes recurred when feeding was restarted or increased. On the third day of life, a central venous catheter was placed and total parenteral nutrition was started. Diaphragmatic elevation due to bowel distension caused transient breathing impairment requiring oxygen administration either through nasal cannulae or by temporary endotracheal intubation. During the following 3 weeks, no spontaneous bowel movements were observed

and the baby passed stools only after saline enemas, which were given at daily intervals.

INVESTIGATIONS

Repeated abdominal radiographs performed during the obstructive episodes showed distended bowel loops and absence of air-fluid levels; no gas was evidenced in the rectum (figure 1). At contrast enema, performed on day 31, the colon was normally rotated and no transitional zone was documented (figure 2). On day 40, a contrast meal was performed: a normally positioned duodeno-jejunal flexure was documented and no gastric or duodenal distension were evidenced. Based on these findings, suction rectal biopsy was performed which demonstrated the presence of normal ganglia and the absence of hypertrophied fibres. Blood, urine and cerebrospinal fluid cultures were negative.

TREATMENT

An exploratory laparotomy was performed on day 55. A diffuse distension of the entire small bowel was confirmed; no signs of poor perfusion of the bowel loops were detected. The caecum was distended and the ascending colon was partially obstructed by a congenital band originating from the lateral abdominal wall and extended to the

Figure 1 Orthostatic abdominal x-ray showing homogeneous distension of the bowel loops and elevation of the diaphragm. No thickening of the bowel walls nor pneumatosis are evidenced.

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Figure 2 Contrast enema showing a distended caecum; the arrow indicates the site of the extrinsic compression where a kinking of the ascending colon was found at laparotomy.

duodeno-jejunal flexure. The band was flimsy, devoid of relevant vascularisation and determined a kinking in the ascending colon (figure 3). Section of the band was performed and patency of the entire colon was checked by irrigation through the caecal appendix, which was subsequently removed.

OUTCOME AND FOLLOW-UP

Postoperative course was uneventful and oral intake was resumed on postoperative day 6. At 6-month follow-up, no other obstructing episodes have been observed.

DISCUSSION

The most common causes of intestinal obstruction in the neonatal period are small intestinal atresia, Hirschsprung disease, meconium ileus, intestinal malrotation and volvulus.¹

Anomalous congenital bands causing colonic obstruction are very rare in paediatric surgical practice; their diagnosis is often challenging.⁴⁻⁹

The aetiology of these bands is obscure and their localisation is different from that of the well-known embryonic remnants such as vitelline vessels or omphalomesenteric duct.⁵⁻¹⁰ Akgur *et al*⁴ speculated that this band originates from a mesenteric anomaly, at about the 28th day when intestines assume their final position and their mesenteries are pressed against the posterior abdominal wall, thus fusing with the parietal peritoneum

Figure 3 Intraoperative view after section of the band. The bowel loops and the caecum are distended; note the persistent kinking of the ascending colon.

and disappearing. Maeda *et al*⁶ made a similar hypothesis while reporting a case of intestinal obstruction caused by a band originating from a residue of the ventral mesentery. Liu *et al*¹¹ reported a case of proximal jejunal obstruction, in a 2-year-old boy, due to a congenital band that ran from the antimesenteric wall of the proximal jejunum to the root of the mesentery, concluding that the band was a remnant of ventral mesentery.

Obstructive mechanisms are compressions of the intestine by the band or entrapment of an intestinal loop between the band and the mesentery.^{4-6,7} Intestinal obstruction is a life threatening condition and early diagnosis is important to prevent complications such as strangulation or overwhelming infection.¹² In the present case, the obstructive mechanism was due to compression and kinking of the ascending colon with mild distension of the caecum and transient distension of the bowel loops.

The present case shows some similarities with those previously described (origin of the band from the root of the mesentery and possible aetiology) but is unique in that the obstruction affects the ascending colon.

A thorough examination of the literature on the subject in the paediatric population has been summarised in table 1.^{4-6,9,11-15}

The largest reported series is that of Akgur *et al*.⁴ In each case, histological examination of the band revealed connective tissue including vessels and nerve plexi. The site and course of the bands varied widely among patients. The obstruction affected the ascending colon only in one out of eight cases; the patient was a 9-day-old baby and the band extended from the liver to the ascending colon.

To the best of our knowledge, such a condition has never been reported in a preterm baby.

In all the reported cases presenting symptoms are those of an intestinal obstruction or chronic abdominal pain in patients older than 2 years of age.^{4-6,8,11,12}

In our case, presenting symptoms were vomiting, feeding intolerance, difficulty in passing stools and recurrent abdominal distension leading to respiratory insufficiency.

Table 1 Reported cases of extrinsic intestinal obstruction by congenital bands in paediatric population

N° patients	Author	Age	Sex	Site of obstruction
2	Touloukian <i>et al</i> ¹³	3 months	M	Proximal
		1 months	M	Jejunum
8	Akgur <i>et al</i> . ⁴	6 days	M	Jejunum
		10 months	F	Jejunum
		3 months	M	Jejunum
		4 years	M	Jejunum
		2.5 years	M	Jejunum
		6 years	M	Jejunum
		5 months	M	Jejunum
		9 days	M	Ascending colon
1	Lin <i>et al</i> ⁸	6 months	M	Sigma
1	Atta <i>et al</i> ¹⁴	15 years	M	Colon
1	Maeda <i>et al</i> ⁶	17 years	M	Ileum
1	Etensel <i>et al</i> ⁷	7 years	M	Ileum
1	Liu <i>et al</i> ¹¹	2 years	M	Proximal jejunum
1	Itagaki <i>et al</i> ¹⁵	4 years	M	Jejunum
1	Dimitros <i>et al</i> ⁹	20 years	M	Ileum
1	Sung and Cho ¹²	27 days	M	Ileum
1	Present case	2 months	M	Ascending colon

Diagnosis is often difficult to achieve before surgery because there are no radiological examinations that allow a definitive preoperative identification of extrinsic intestinal obstruction. In most of the cases reported in the literature, surgery was required for acute intestinal obstruction, although patients often presented with mild abdominal distension, vomiting, feeding intolerance and constipation. The patients were usually studied by abdominal x-ray film, upper gastrointestinal series, contrast enema, CT scan; in almost all the cases these exams showed radiological features of intestinal obstruction such as dilated intestinal loops and intestinal air fluid-levels.

Extrinsic intestinal obstruction was suspected in one case reported by Liu *et al*¹¹ in which an upper gastrointestinal series showed nearly complete duodenal obstruction near the Treitz's ligament. However, a correct diagnosis was made only after laparotomy.

In our case, according to previous experiences, the final diagnosis was made at surgical exploration; due to the absence of any abnormal finding at prenatal ultrasound and a negative AchE staining at rectal biopsy, a possible obstruction by extrinsic compression should have been inferred despite the supposed normal findings at barium meal and contrast enema.

When a complete obstruction is absent, rectal biopsy is always necessary in order to rule out disganglionosis or Hirschsprung disease. Upper gastrointestinal series and contrast enema can help to make a reliable diagnosis in most of the cases or at least to narrow a differential diagnosis. Therefore, close collaboration between paediatric surgeon and radiologist is of utmost importance to fasten diagnosis and to avoid excessive exposure of the patient to radiations.¹²

In our case, the long time elapsed from the appearance of symptoms and the final diagnosis confirms that preoperative diagnosis of congenital bands is not always easy and sometimes impossible by means of radiological studies. Owing to such difficulties in cases of repeated abdominal distension, when no signs of sepsis are detected and suction rectal biopsies findings are negative, exploratory laparotomy should be considered even if contrast studies are not conclusive and clear signs of complete bowel obstruction are not evidenced at plain x-ray.

Moreover, in cases in which diagnosis is not achieved through routine examinations the possibility of an extraluminal obstruction by a congenital band should always be kept in mind and early laparotomy should be performed in order to minimise the risks connected to prolonged total parenteral nutrition and hospitalisation.

Learning points

- Congenital peritoneal bands must be considered in the differential diagnosis of complete and incomplete intestinal obstruction.
- In cases in which a congenital band determines an incomplete obstruction the radiological studies cannot be diagnostic.
- In cases of persisting obstructive symptoms, when a full diagnostic work-up is inconclusive, the option of an exploratory laparotomy should be considered in order to rule out rare diagnoses, such as congenital bands.

Competing interests None.

Patient consent Obtained.

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