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Ileal obstruction from Meckel's diverticulum in a neonate: A case report and review of literature

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ABSTRACT

Meckel's diverticulum is the most common of the omphalomesenteric duct anomalies encountered in clinical practice. It may present with a wide variety of symptoms. Presentation in the neonatal period is very rare. We present a case of ileal obstruction from Meckel's diverticulum in a neonate with resultant stenosis of the proximal and distal bowel adjoining the Meckel's diverticulum and a short review of literature. Intrinsic intestinal stenosis should be borne in mind as one of the mechanisms by which Meckel's diverticulum causes bowel obstruction.

Meckel's diverticulum (MD) is a true diverticulum of the small intestine and is the commonest congenital anomaly of the small bowel [1,2]. It results from incomplete involution of the omphalomesenteric duct [1–3]. Incidence has been reported to be between 2 and 4% of the general population either at surgery or autopsy [1–4].

Meckel's diverticulum may be asymptomatic and discovered incidentally at surgery, during investigation or at autopsy [3–6]. It can also produce a wide range of symptoms. Symptomatic Meckel's diverticulum may manifest with life-threatening complications or just mimic other abdominal conditions [1,2,4,6]. Though no age group is exempt, symptomatic MD presenting in the neonatal period is rare [3,5,7,8].

Intestinal obstruction is one of the commonest manifestations of symptomatic MD [2,4–6,9,10]. The mechanisms by which MD produces intestinal obstruction range from volvulus [1,3,5,9], intussusception [1,3,5], bands [3–5], to Littre's hernia [3,5,11] and internal hernias [3,5].

Unlike other pediatric age groups, the most common presentation of symptomatic MD in neonates is intestinal obstruction usually resulting from inflammation or ileal volvulus [7,9,12]. Other reported but rare mechanisms include bands [13], Littre's hernia [11] and intussusception [10]. This requires a high index of suspicion in managing neonatal intestinal obstruction.

In this case report we highlight our experience with a case of MD presenting with intestinal obstruction in a neonate.

1. Case report

A 6 day old male neonate weighing 3.3 kg and a product of an uncomplicated pregnancy, labor and delivery was admitted on account of inability to pass stool, abdominal distension and bilious vomiting. Symptoms had started 4 days previously. He had passed meconium within 24 h of birth and had been opening bowel regularly till the onset of symptoms.

Physical examination revealed a dehydrated term neonate who was not pale. Vital signs were: heart rate of 138 beats per minute, respiratory rate of 46 breaths per minute and temperature of 37 °C. Gross abdominal distension with visible peristalsis was observed. Liver and spleen were not palpable and the kidneys were not ballotable. Increased bowel sounds were noted. On digital rectal examination the rectum was empty.

Plain abdominal radiograph revealed features of small bowel obstruction with multiple air fluid levels and dilated loops of small bowel. Hematocrit was 35% and electrolytes were within normal range.

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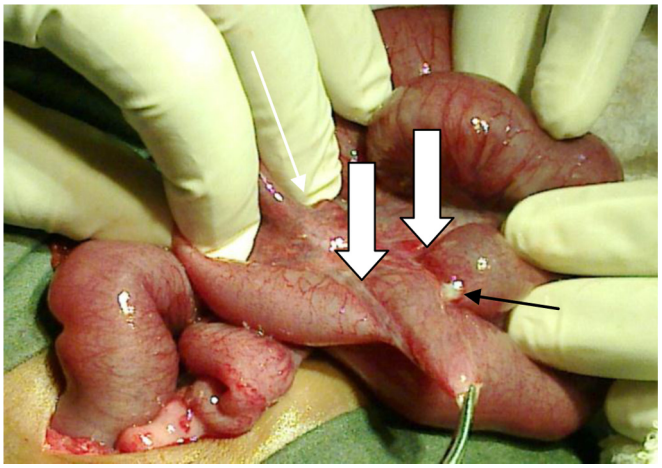

Fig. 1. Showing areas of intrinsic stenosis (white solid arrows). Impending perforation (black arrow).

After resuscitation, an exploratory laparotomy was carried out. Intraoperative findings were obstruction at the site of a Meckel's diverticulum with marked dilatation of the proximal bowel. The distal bowel was collapsed. Both limbs of bowel were viable. The diverticulum was attached to the posterior wall of the umbilicus and showed no sign of gangrene. The portion of the proximal bowel and distal bowel adjoining the Meckel's diverticulum were stenotic and intestinal contents could hardly be made to pass through that portion of the bowel (Fig. 1).

Segmental resection of the MD and adjoining ileum was done and primary ileoileal anastomosis performed.

Post-operative course was uneventful and the patient made full recovery.

Histological examination of the specimen showed small bowel mucosa without any heterotopic tissue.

At follow up 2 years later, the child is doing well with normal physical and psychomotor development.

2. Discussion

Intestinal obstruction accounts for 30–56% of symptomatic Meckel's diverticulum [9,10]. Commonly documented mechanisms of obstruction are volvulus, intussusception, bands, Littre's hernia, internal hernias and strictures [1,3,5,9,11]. Less common mechanisms include inflammatory adhesions, kinking, inspissation or impaction of milk cord or meconium, obstruction by parasites, phytobezoars and tumors [3,5,9]. Intrinsic stenosis of the bowel as a cause of intestinal obstruction is reported following relief of strangulated external hernias or from bowel constriction by internal hernias or congenital bands [14–16]. Intrinsic stenosis complicating Meckel's diverticulum has been reported in association with mesodiverticular band [16] and following reduction of strangulated Littre's hernia [17]. However, intrinsic stenosis from Meckel's diverticulum in a neonate as in our case is unusual and considered worthy of reporting.

Visnjic et al. [17] reported stenosis of the small intestine following reduction of strangulated Littre's hernia in an infant. The stenosis was attributed to temporary ischemia with subsequent progressive stenosis of the involved small bowel. Akamine et al. [16] published a case of MD complicated by stenosis of the colon in a 17 year old male. They found compression of the ascending colon by a mesodiverticular band. These bands are known to cause strangulation of the compressed bowel and may lead to stenosis [16,18].

A search of English literature did not yield a similar case as ours and so the exact mechanism of intestinal stenosis in our patient is unclear. We speculate it could have resulted from: (1) torsion and detorsion of the ileum about the fixed Meckel's diverticulum or (2) chronic kinking of the bowel at the fixed Meckel's diverticulum. Any of these could lead to hypoperfusion and ischemia at the fixed points of the bowel with subsequent stenosis. Halstead [18], had hypothesized that obstruction from torsion of the diverticulum may occur when the diverticulum is attached. In most of these cases, obstruction is acute but in a few cases, chronic obstruction exists for long before the acute obstruction developes [18]. This is particularly true where proximal stenosis of the bowel exists [18]. Kinking caused by traction on the bowel at the point of attachment of the diverticulum also causes chronic obstruction and favors narrowing of the bowel [18]. It is plausible to speculate that either of these mechanisms would explain the stenosis observed in our patient.

A preoperative diagnosis of neonatal bowel obstruction caused by Meckel's diverticulum is difficult to make [1,4,6,9,11,15]. Differentiating intrinsic intestinal stenosis resulting from Meckel's diverticulum from other causes of neonatal bowel obstruction may be daunting. There are no distinguishing clinical features. Plain abdominal X-Ray is non-specific and will give features suggestive of small bowel obstruction [1,5,6,11,19]. Ultrasonography may be more suggestive in cases where Meckel's diverticulum is complicated by volvulus, meconium impaction or intussusception [6,9,14,19]. Routine computed Tomography scan is not advocated in cases presenting with intestinal obstruction [15,19]. Therefore, as in cases of stenosis resulting from mesodiverticular or mesoumbilical bands the cause may be identified only at laparotomy.

In conclusion, neonatal bowel obstruction can be caused by intrinsic intestinal stenosis resulting from Meckel's diverticulum. It may be difficult to make this diagnosis preoperatively. Intrinsic intestinal stenosis should be borne in mind as one of the mechanisms by which Meckel's diverticulum causes bowel obstruction.

Conflicts of interest

None.

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