Letter to the editor

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Meconium obstruction in a premature neonate: An etiology that may simulate spontaneous intestinal perforation

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Dear Editor

A surgeon expects either necrotizing enterocolitis (NEC) or spontaneous intestinal perforation (SIP) in preemies with pneumoperitoneum. But there is another cause wherein the operative findings simulate meconium ileus [1]: The terminal ileum and colon are tiny and obstructed by inspissated meconium; The bowel proximal to the obstruction may be diffusely dilated, or there may be aneurysmal (segmental) dilatation, which may be single or multiple; Resection with ileostomy is all that is attempted in these tiny, fragile babies; Surprisingly, when the ileostomy is closed 4-6 weeks later, the bowel appears to be normal, the obstruction has cleared and the caliber disparity has disappeared, which suggests that immaturity was causative of the obstruction and the occasional aneurysmal dilatation.

A 29-week GA 1.2 Kg boy was delivered by Cesarean section, because of breech presentation. His mother was 39 years old, G4P1. Passage of meconium was delayed, and a contrast enema was obtained. Multiple meconium plugs were loosened, and the baby had a sizable evacuation (Fig. 1A). Feedings were begun but not tolerated; and after a week's discouragement, an abdominal radiograph was obtained that showed intestine of varying caliber, the hallmark of mechanical intestinal obstruction (Fig. 1B). An Upper GI small bowel follow-through showed slow, but the eventual passage of contrast through the dilated, partially obstructed small bowel, through diminutive terminal ileum, eventually reaching the colon and rectum (Fig. 1C, ID). We decided to withhold feedings for 7-10 days and instill Mucomyst (N acetylcysteine). This strategy was successful, and the infant was spared an ileostomy and is now tolerating full feedings. The baby's Cystic Fibrosis screen (IRT) was normal.

Operating upon several premature babies with SIP, I have noted that the perforation sometimes occurs in a segment of the bowel with aneurysmal (localized) dilatation; this finding is associated with intra-luminal obstruction of the terminal ileum, an appearance simulating meconium ileus. This meconium obstruction of the newborn occurs in the same group of neonates who are subject to spontaneous intestinal perforation, and the same risk factors are seemingly operative: intestinal immaturity - poor motility, inadequate production of mucin, and the many other deficits that characterize low birth weight (LBW) infants. [2]

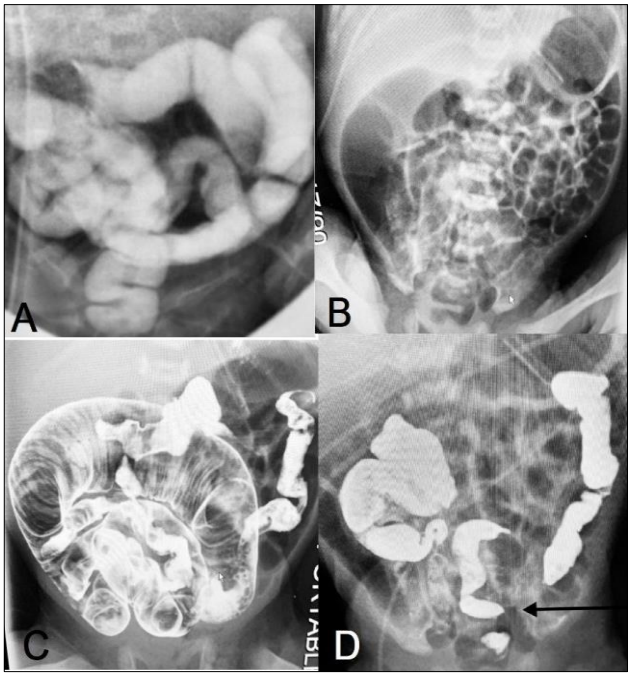

Figure 1: A) Contrast outlines the colon. B) X-ray abdomen showing dilated small bowel loops. C) Contrast outlines the dilated small bowel loops. D) Ultimately the contrast evacuates to the rectum (Arrow)

In these micro-preemies, intestinal perforation is not "spontaneous"; rather, it is caused by intra-luminal obstruction of the terminal ileum. The more proximal bowel dilates; and if the muscular layer is weak (inadequately developed), aneurysmal dilatation may occur and ultimately a perforation. During enterostomy closure, I have searched for the aneurysmal

segments (if they were multiple) and the obstructed terminal ileum, but they had vanished. The appearance of the bowel was normal!

This experience informs the conviction that meconium obstruction of the newborn is a developmental phenomenon. If non-operative intervention successfully relieves the obstruction, normalization will occur over time, and the only indication for surgical intervention is perforation. [2]

I found this case interesting for two reasons: How rapidly the distal bowel grows once the obstruction is cleared and flow is established; if the obstruction was not relieved, perforation with the operative puzzling findings might supervene.

This was not necrotizing enterocolitis or spontaneous intestinal perforation [3] or segmental intestinal dilatation [4], which does not resolve spontaneously and may itself cause intestinal obstruction. This was something different; and hence, my puzzlement!

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