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INTERNAL HERNIA AS A CAUSE FOR INTESTINAL OBSTRUCTION IN A NEWBORN

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☐ **Abstract—Background: An internal hernia is a rare cause of intestinal obstruction, which can occur at any age. Children most often develop an internal hernia due to a congenital defect in the mesentery. While some patients are asymptomatic, others present to medical attention with vague abdominal symptoms, an acute abdomen, or in shock. Case Report: We report a case of a 5-day-old previously healthy baby who presented to our pediatric emergency department with bilious vomiting, grossly bloody stool, and abdominal distention. During an exploratory laparotomy, the patient was diagnosed with an internal hernia caused by a congenital mesenteric defect. Why Should an Emergency Physician Be Aware of This?: Although internal hernia is an infrequent cause of intestinal obstruction in a newborn and requires emergent operative repair, it may be mistaken for other more common causes, such as necrotizing entercolitis, which are often managed medically. This case report aims to highlight some of the difficulties in diagnosis and key features that may assist the clinician in identifying these patients.** © 2015 Elsevier Inc.

☐ **Keywords—internal hernia; transmesenteric; children; obstruction; newborn**

INTRODUCTION

In general, internal hernias are uncommon, accounting for 0.5%−5.8% of intestinal obstruction cases (1). An internal hernia is an acute or chronic protrusion of the viscera through a mesenteric or peritoneal defect. They can be congenital or acquired and present clinically at any age. The symptoms due to an internal hernia are frequently vague, but the morbidity and mortality are often significant. This case report of a neonate with an internal hernia seeks to demonstrate some of the difficulties with diagnosis and to present the important elements that can aid the clinician in identifying patients at risk for this time-critical surgical condition.

CASE REPORT

A 5-day-old full-term boy presented to the pediatric emergency department (PED) with anorexia and emesis for 1 day. The mother reported that all her prenatal screening tests were normal. The patient was born via an uncomplicated vaginal delivery, passed meconium 9 h after birth, fed well in the newborn nursery, and was discharged home on the third day of life. During the next 2 days, the patient was noted to have several episodes of yellowish "spit up." He was being fed 4 oz of formula every 3 h, had adequate urine output and normal bowel movements. On the 5th day of life, the primary medical doctor evaluated the patient and noted him to be well appearing with a normal physical examination; according to the mother, he attributed the child's symptoms to overfeeding. After returning home, the mother reported that the baby was taking less formula than usual, and had an

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episode of "green-colored" emesis. This prompted the mother to bring the patient to the PED.

Upon presentation to the PED, the patient had a temperature of 37.9°C, a heart rate of 144 beats/min, a respiratory rate of 56 breaths/min, and an oxygen saturation of 98% in room air. The child was observed to be sleepy with mild erythema of the periumbilical skin. Examination of the heart and lungs was normal; the abdomen was soft and nontender, but mildly distended. He had good muscular tone, a capillary refill < 2 s and was anicteric. During his evaluation in the PED, the patient had a yellow grainy stool with gross blood. A peripheral i.v. catheter was placed, laboratory tests were drawn, and a pediatric surgeon was consulted. All laboratory values were within normal limits for age. An abdominal x-ray study (Figure 1) showed multiple loops of stretched and thickened small bowel in the mid-abdomen, but no evidence of pneumatosis intestinalis, free air, abnormal masses, or calcifications. While in the PED, the patient had two additional episodes of hematochezia. Upper and lower gastrointestinal (GI) series were performed and demonstrated no evidence of malrotation or Hirschsprung disease, respectively. With the symptoms of bilious emesis and hematochezia, intestinal obstruction and ischemia appeared highly likely in this neonate and prompted the decision to take the patient to the operating room directly from the PED. The patient underwent an exploratory laparotomy, where he was found to have a transmesenteric internal hernia. In the operating room, the distal ileum was noted to be ischemic, congested, and protruding through a mesenteric defect at the level of the ligament of Treitz. After the internal hernia was reduced, the small bowel was found to be viable and did not require resection. The mesenteric defect was closed and the patient was transferred to the pediatric intensive care unit for further management. The hospital course was uncomplicated and the patient was discharged home after a weeklong hospital stay. During the next year, the patient continued to grow well without any further episodes of abdominal pain or feeding difficulty.

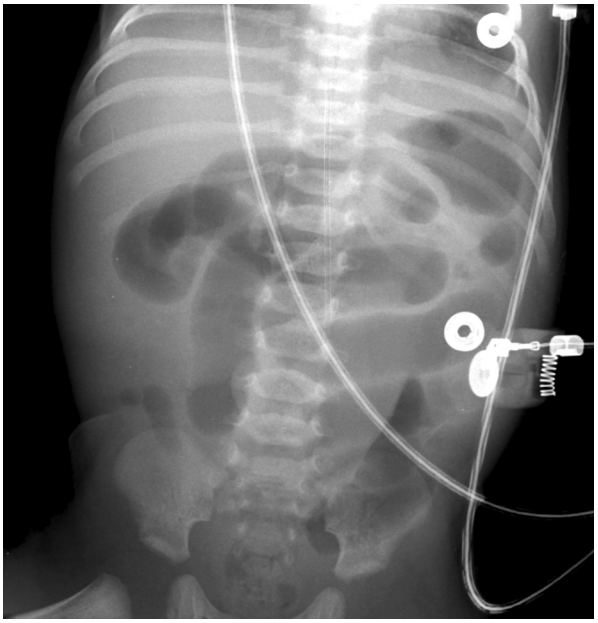

Figure 1. Abdominal x-ray study demonstrating small bowel obstruction with multiple loops of distended and thickened small bowel.

DISCUSSION

Bilious vomiting in a newborn is a concerning symptom that requires immediate attention, as it often is indicative of intestinal obstruction. One recent study found that almost half (46%) of neonates with bilious emesis in their sample were eventually diagnosed with a surgical condition; many (14%) had a "time critical" diagnosis (2). The more common causes of bilious emesis in this age group include duodenal atresia, necrotizing enterocolitis (NEC), midgut malrotation with volvulus, and Hirschsprung disease (2). Internal hernias, although a much more rare cause of bilious emesis and obstruction, can result in bowel strangulation, necrosis, and death, if not detected early (3,4).

Certain key features in the history and physical examination, along with some common ancillary tests, often point to the cause for the bilious emesis. *Prenatal history* is important, as many infants with genetic disorders that are associated with intestinal obstruction, such as Down syndrome and duodenal atresia, would be detected by routine prenatal screening tests (5). *Hematochezia* is always a concerning symptom when accompanied by bilious emesis, as intestinal ischemia is likely present. Few nonsurgical diseases present with both. NEC, while often a disease of the preterm low-birth-weight infant, can occur in up to 13% of term infants and cause both bilious emesis and hematochezia (6). These infants, however, unlike our patient, usually have a pre-existing condition (7). The cardinal feature in diagnosing a patient with NEC is the presence of pneumatosis intestinalis, or air in the bowel wall, on *plain abdominal x-ray* study. NEC is most commonly managed with antibiotics and supportive care and not surgery. An *upper GI series* is helpful when considering intestinal volvulus due to midgut malrotation. Infants with this disease often present to the ED in extremis and, while bilious emesis is a common symptom, hematochezia typically is not reported. The diagnosis of volvulus, a true surgical emergency, is best made on an upper GI series demonstrating a misplaced duodenum and a typical "corkscrew" appearance (8). A *lower GI series* can be useful in diagnosing Hirschsprung disease and would show a transition zone,