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Spontaneous Gastric Perforation in a Neonate Presenting as Gastric Outlet Obstruction

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Abstract

Gastric perforation in neonates is a rare but frequently fatal condition which is associated with massive pneumoperitoneum in radiography. Here, we report a case of neonatal spontaneous gastric perforation presenting as gastric outlet obstruction rather than pneumoperitoneum. Physical examination and imaging modalities were indicative of abdominal distension and gastric outlet obstruction. With diagnosis of gastric perforation at laparotomy, subtotal gastric resection was performed and a feeding jejunostomy was placed. The present report highlights that gastric perforation should be of clinical suspicion in neonates with abdominal distension and unusual imaging findings rather than pneumoperitoneum.

Keywords: Spontaneous gastric perforation; gastric outlet obstruction; pneumoperitoneum

1. Introduction

Gastric perforation in neonates is a rare but frequently fatal condition of uncertain etiology. It usually occurs in infants requiring resuscitation or having an episode of hypoxia following birth (1). Although massive pneumoperitoneum is a consistent radiographic characteristic in most of the cases, a few reports have highlighted unusual imaging findings in neonatal gastric perforation (2). Here, we report a case of neonatal spontaneous gastric perforation presenting as gastric outlet obstruction rather than pneumoperitoneum in imaging modalities.

2. Case presentation

A male infant (weight: 3375g) was born at term following an uneventful elective cesarean delivery. During the first day, he developed respiratory distress and hematemesis. Physical examination revealed a lethargic infant with hypotension, hyporeflexia and tachypnea and a blood pressure of 95/65 mmHg, body temperature of 36.4°C, respiratory rate of 66/min, and pulse rate of 150/min. Subsequently, he received cross-matched packed red blood cells and antibiotics

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(cefazolin, amikacin, and vancomycin) in the maternity hospital.

On day 10 of life, he was admitted to our university-affiliated hospital with abdominal distention. The patient had normal urination and defecation during first 10 days. On admission, physical examination revealed blood pressure 100/70 mmHg, body temperature 36.7°C, pulse rate 130/min, and respiratory rate 44/minute. Abdominal examination showed marked abdominal distension and decreased bowel sounds. Laboratory findings were as follows: white blood cells $13.3\times10^3/mm^3$, hemoglobin 9.5 g/dL and normal metabolic state (pH=7.34, HCO_3^-=21.1 mmol/L and PCO_2=39 mmHg). Thoracoabdominal X-ray (Figure 1) and barium radiography illustrated an obstruction in stomach and proximal intestinal tract (Figures 2 and 3). Abdominal sonography showed pyloric muscle thickness (5 mm), pyloric channel length of 14mm, and pyloric channel diameter of 12mm, indicative of gastric outlet obstruction.

Based on the preoperative diagnosis of gastric outlet obstruction, laparotomy through supraumbilical incision was performed on day 4 of admission. At laparotomy, remnant barium leaking from the gastric wall was noted. Further inspection revealed a gastric perforation with necrotic rims. While preoperative radiological diagnosis was indicating of a partial obstruction thereupon the barium aggregation in delayed radiographic observations. Subsequently, subtotal gastric resection was performed and a feeding jejunostomy was placed. He made a good recovery and was discharged from hospital 12 days after admission.

3. Discussion

The present report demonstrates a case of spontaneous gastric perforation, despite manifestations of gastric outlet obstruction in both radiological and ultrasound evaluations. To the best of our knowledge, the present case is the first report of neonatal spontaneous gastric perforation presenting as gastric outlet obstruction rather than pneumoperitoneum. A bizarre presentation of neonatal spontaneous gastric perforation with hydroperitoneum rather than pneumoperitoneum has been reported by Im et al (2).

Visceral perforation in infants is a rare entity (3). Among these, neonatal gastric perforation often occurs without any apparent precipitating event, after which patients deteriorate rapidly (4). Many theories have been proposed for the pathogenesis of gastric perforation; however the etiology is still unknown. Male gender, hyponatremia, metabolic acidosis, low birth weight and prematurity have been suggested to be poor prognostic factors for survival (5).

There are reports of spontaneous gastric perforations in otherwise healthy infants, usually during the first week of life (6). This clinical entity covers any etiology rather than necrotizing enterocolitis or ischemia, trauma following gastric intubation, obstruction of the distal intestine, or accidental stomach insufflation in the course of assisted ventilation. Although perinatal stress and prematurity are common associations, no predisposing factors can be identified in at least 20% of patients with spontaneous gastric perforations (7). Congenital defects in the gastric wall muscles have been hypothesized as the underlying etiologies of the spontaneous perforations (7,8). Spontaneous gastric perforation often occurs at 3 to 5 days of life with poor activity, abdominal distension and respiratory distress as early manifestations (4). Moreover, signs of hypokalemia and decreased perfusion presenting with tachycardia and lethargy has been reported. In the present case, the patient presented with abdominal distension, respiratory distress and tachycardia.

Debridement and two layer closure of the stomach, without significant gastric resections, are the procedures usually performed in the surgical repair of most perforations. In some

cases, gastrostomy may be indicated (9). In the postoperative period, supportive therapy along with the use of broad spectrum intravenous antibiotics is required (10). Survival of these patients is affected by the duration between the onset of symptoms and the start of definitive therapy, the degree of peritoneal involvement, the prematurity grade and the severity of other asphyxia-related consequences. Mortality rates of gastric perforations are high (45-58%) as sepsis and respiratory failure in premature infants give rise to the complications of this clinical entity (6,11).

In conclusion, our case highlights that clinical suspicion of gastric perforation should be focused on neonates with abdominal distension with unusual imaging findings rather than pneumoperitoneum.

Conflicts of interest

The authors declare that they have no conflict of interest.

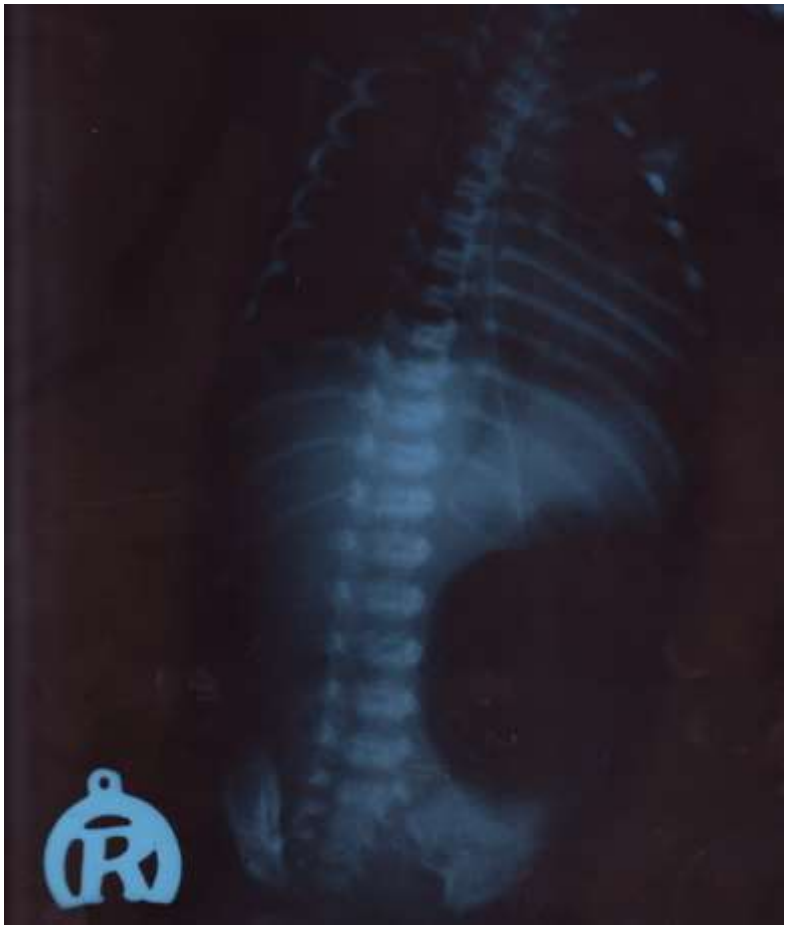

Figure 1. Thoracoabdominal radiography illuminating severely dilated stomach

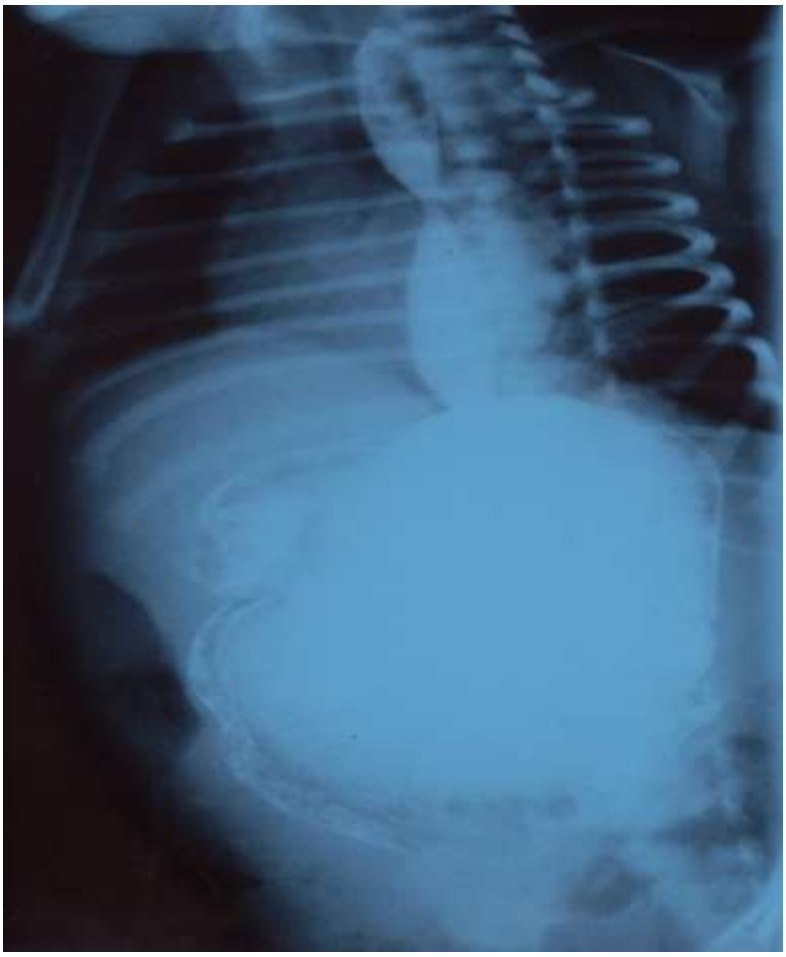

Figure2. Lateral barium radiography indicated of dilation (most probably a dilated stomach)

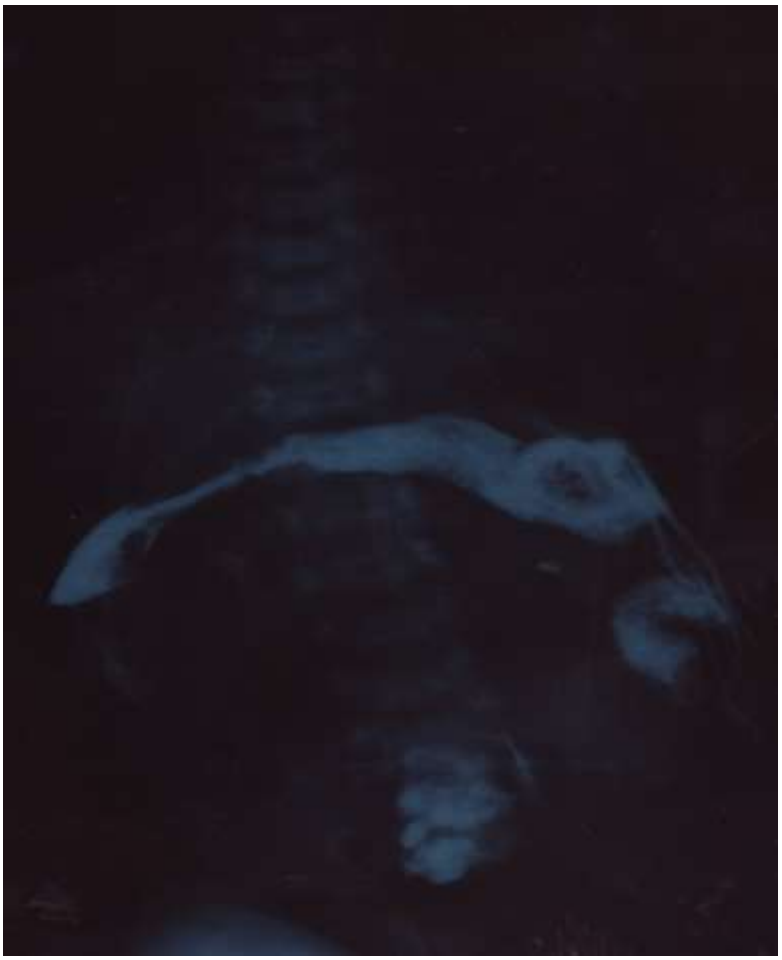

Figure 3.Delayed radiography. The remaining barium is indicative of a partial obstruction in the gastrointestinal tube

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