

# A Curvilinear Lucency in a Neonatal Abdominal Radiograph

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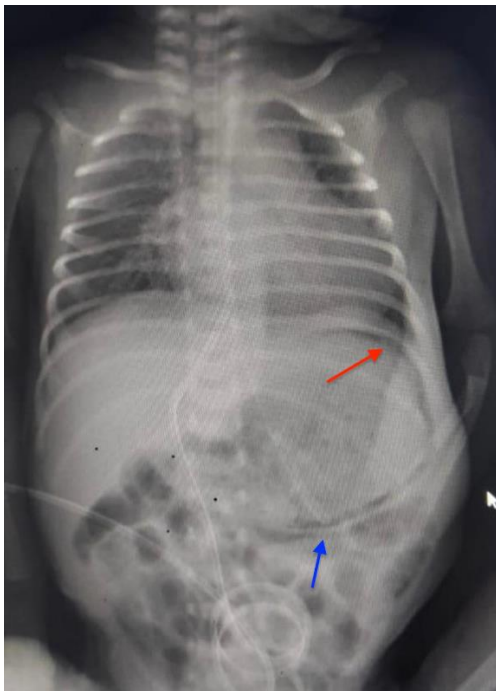
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A preterm male small-for-date newborn (36 weeks & 1600 grams; < 3<sup>rd</sup> percentile) infant was evaluated for altered gastric aspirates in the coffee-coloured aspirates in the neonatal intensive care unit of All India Institute of Medical Sciences Bhopal, India. The infant was initiated for gavage feedings for early-onset hypoglycemia soon after birth. Altered coffee coloured aspirated emerged at 48 hours of life which mimicked the initial stages of necrotizing enterocolitis. However, a soft abdomen on palpation, audible bowel sounds, and frequent meconium passages were reassuring. Concurrently, the rising glucose infusion concentrations required an umbilical venous line placement. A curvilinear lucency was captured on an abdominal radiograph done for the umbilical venous line, which raised clinical suspicion of a serious ailment [Figure 1]. After this incidental finding, the infant was kept nil per oral and parental nutrition was commenced. A repeat x-ray and an ultrasound suggested a resolving air collection after 24 hours of detection. Soon, the aspirates were clear, and the infant was fed orally. The infant was discharged after two weeks in good health. The infant was seen at four months of age and grew well.



**Figure 1:** An anteroposterior abdominal radiograph of a newborn with an umbilical venous catheter in situ. A curvilinear gastric pneumatosis is seen (red arrow). A gavage tube abutting the gastric wall is captured (blue arrow).

## Question

What is the most likely diagnosis?

- a. Necrotizing enterocolitis
- b. Gastric pneumatosis
- c. Spontaneous intestinal perforation
- d. Intestinal malrotation
- e. Pneumoperitoneum

### ***Answer***

- b. Gastric pneumatosis

### **Discussion**

Gastric pneumatosis is a distinct curvilinear lucency paralleling and limited to the gastric curvature on a radiograph [red arrow; Figure 1]. Gastric-outlet obstruction, critical illness, or widespread necrotizing enterocolitis, sepsis, and asphyxia are reported as etiologies.<sup>1-4</sup> Raised gastric pressure creating a mucosal rent, pneumomediastinum tacking into gastric musculature with positive pressure support application or infection with gas-producing organisms are postulated mechanisms.<sup>5,6</sup> The extraluminal gas accumulation in pneumatosis intestinalis can be submucosal or subserosal. The intramural gas accumulation in the gastric musculature gives a characteristic curvilinear shape of the gastric wall. Pneumatosis intestinalis can involve any part of the intestine. However, gastric pneumatosis is limited to the gastric area. A differential diagnosis of this condition may be emphysematous gastritis, which presents with significant sickness.

Diagnosing gastric pneumatosis on an abdominal radiograph is straightforward, and the management is directed towards the underlying etiology. The index infant had a single risk factor of gavage tube placement. Gastric pneumatosis arising from a mispositioned gavage tube is rare.<sup>5</sup> A gastric mucosal tear from the pressure created while aspirating the gavage tube to check gastric contents might also be responsible for gastric pneumatosis in the index newborn. This injury is explained by the appearance of coffee-brown aspirates during the course of the stay. This gavage tube-related gastric pneumatosis healed spontaneously and with supportive care. Due to the subtle clinical signs of this condition, a timely radiograph clinches the diagnosis. The index case mimicked an initial phase of necrotizing enterocolitis; however, a favourable course with conservative management of an isolated gastric pneumatosis can be expected when the newborn's general condition is stable.

### **References**

1. Cohen HL, Chism PB, Radtke I. Excessive Bright Echoes Sign for Hypertrophic Pyloric Stenosis Suggest the Diagnosis: Gastric Pneumatosis and Portal Venous Gas in Infants Suggest HPS. *J Ultrasound Med* 2017 May;36(5):1059-1063.
2. Angadi C, Chaurasia S, Priyadarshi M, Singh P, Basu S. Gastric Pneumatosis in a Neonate Born Late Preterm on the First Day of Life. *J Pediatr* 2023 Mar;254:102-103.
3. Bayoumi MA, Elmalik EE. Gastric pneumatosis in a preterm infant following initial empiric antibiotic therapy. *BMJ Case Rep* 2021 Oct;14(10):e246446.
4. Abusalah ZG, George J. Preterm baby with gastric pneumatosis: a new association with a desirable outcome. *BMJ Case Rep* 2019 May;12(5):e230188.
5. Ting YJ, Chan KL, Wong SC, Chim S, Wong KY. Gastric pneumatosis in a premature neonate. *AJP Rep* 2011 Sep;1(1):11-14.
6. Ranjan V, Chowdhry BK, Kumar CM. Emphysematous gastritis in a newborn: Is it very rare or do we just miss it? *J Neonatal Perinatal Med* 2022;15(4):859-861.