

Case Report

Is gastric pneumatosis a clue to upper gastrointestinal obstruction?

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Annular pancreas is one of the extrinsic causes of congenital duodenal obstruction that may be associated with Down syndrome.^[1] While complete obstructions typically present immediately after birth, partial obstructions may lead to delayed diagnosis. In this case, gastric pneumatosis emerged as a rare yet significant indicator of proximal obstruction. Gastric pneumatosis is an uncommon radiologic finding in the gastrointestinal tract, often associated with a severe underlying pathology.^[2] Although it is generally linked to conditions such as prematurity, necrotizing enterocolitis, or immunodeficiency, it may also occur secondary to upper gastrointestinal obstructions.^[3,4]

In this report, we presented an infant with Down syndrome in whom gastric pneumatosis detected on plain abdominal radiography provided an early clue to an underlying duodenal obstruction due to an annular pancreas.

CASE REPORT

A five-month-old male infant with Down syndrome was referred from the emergency

Abstract

Gastric pneumatosis is an uncommon radiologic finding in children and may suggest underlying gastrointestinal pathology. Herein, we reported a five-month-old male infant with Down syndrome who presented with a one-month history of recurrent nonbilious vomiting. Upright abdominal radiography showed a markedly dilated stomach and intramural gas along the gastric wall, raising suspicion for proximal intestinal obstruction. An upper gastrointestinal contrast study revealed a partial obstruction at the level of the duodenum. Surgical exploration identified an annular pancreas encircling the second portion of the duodenum. Due to the anatomical configuration, a duodenojejunostomy was performed. The patient tolerated postoperative enteral feeding and was discharged uneventfully. At the six-month follow-up, the patient remained asymptomatic with appropriate weight gain. This case demonstrates that gastric pneumatosis, although rare, may serve as an early indicator of upper gastrointestinal obstruction. Recognizing this finding on plain radiographs can expedite further diagnostic evaluation and enable timely surgical management. Clinicians should consider anatomical causes, including congenital duodenal anomalies, particularly in syndromic infants with persistent vomiting.

Keywords: Annular pancreas, down syndrome, duodenal obstruction, gastric pneumatosis, radiologic findings.

Received: March 27, 2025
Accepted: June 17, 2025
Published online: July 17, 2026

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Citation:

İnancı İ, Yıldız S, Keskin Çakıcı M, Başaran ÜN. Is gastric pneumatosis a clue to upper gastrointestinal obstruction?. Turkish J Ped Surg 2026;40(2):106-109. doi: 10.62114/JTAPS.2026.139.

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department with a one-month history of recurrent nonbilious vomiting. An upright abdominal radiograph revealed marked gastric dilatation and intramural gastric pneumatosis, predominantly along the greater curvature of the stomach (Figure 1). Despite these findings, distal gas passage was observed. In the upper gastrointestinal contrast study performed to clarify the diagnosis, dilatation of the stomach and the first part of the duodenum was detected. However, a thin stream of contrast was observed to pass distally (Figure 2).

Based on these findings, the patient underwent diagnostic laparotomy with a preoperative diagnosis

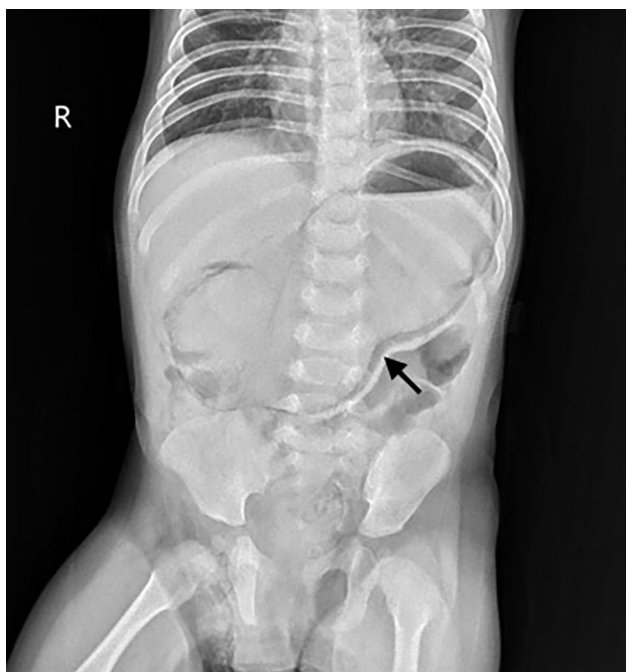


Figure 1. Gastric pneumatosis is indicated by an arrow. Note the distended and fluid-filled appearance of the stomach.

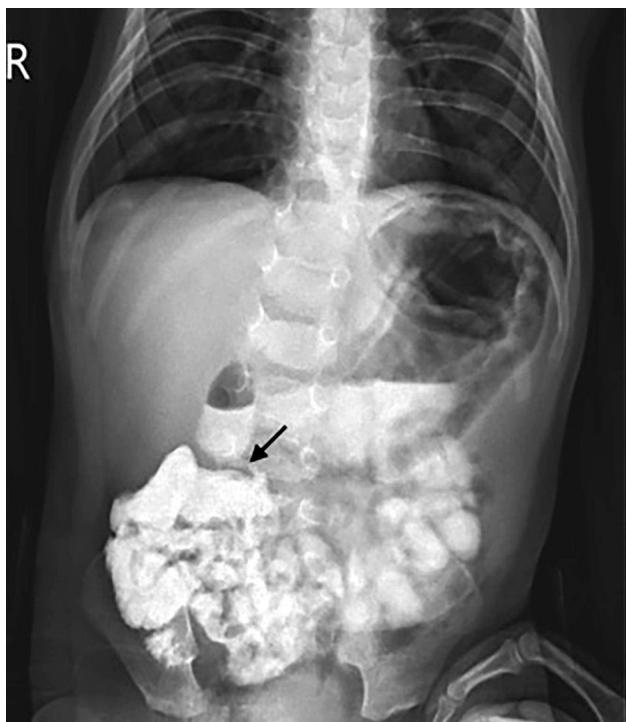


Figure 2. Oral contrast-enhanced upper gastrointestinal radiograph showing a transition point in the duodenum, marked by an arrow, where the lumen narrows due to obstruction.

of partial duodenal obstruction. Surgical exploration revealed an annular pancreas (Figure 3). As a 2-cm-wide band of pancreatic tissue was encircling the second portion of the duodenum and the anatomical configuration was not suitable for duodenoduodenostomy, a duodenojejunostomy was performed instead.

Oral feeding was initiated on the third postoperative day and was well-tolerated. The patient was discharged uneventfully on the fifth postoperative day. At the six-month follow-up, the vomiting had completely resolved, and the patient's weight was within the 50th-75th percentiles. Written informed consent was obtained from the parent of the patient.

DISCUSSION

In the present case, it is postulated that the markedly dilated stomach led to elevated intraluminal pressure, leading to mucosal ischemia, disruption of the mucosal barrier, and translocation of intraluminal air into the submucosal space, ultimately resulting in gastric

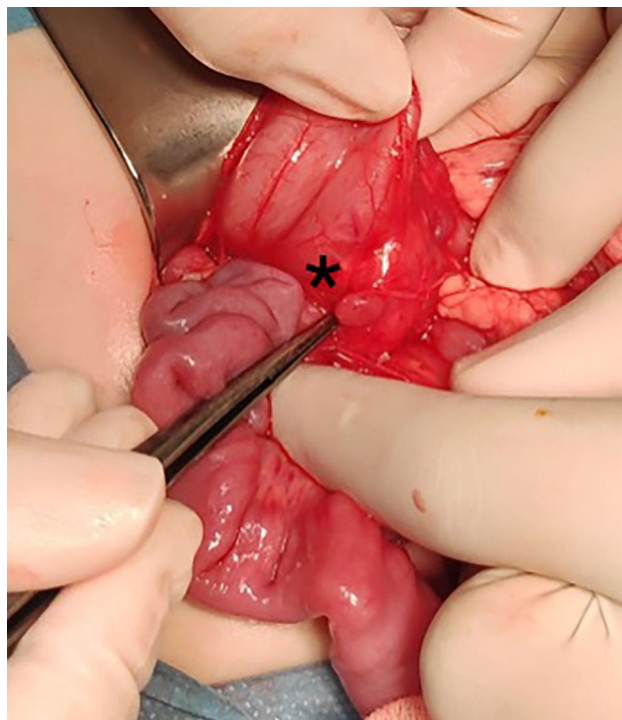


Figure 3. Annular pancreas exerting extrinsic compression on the duodenum is indicated by an asterisk.

pneumatosis.^[5-7] Interestingly, this mechanism may be more pronounced in cases of partial rather than complete obstruction. In complete obstructions, vomiting typically occurs early and prevents significant accumulation of gastric contents, thereby limiting gastric distension and pressure build-up. In contrast, partial obstructions often allow continued passage of small amounts of content, delaying vomiting and enabling progressive gastric distension. This ongoing distension can generate higher intraluminal pressures over time, making the gastric wall more susceptible to pressure-related injury and subsequent pneumatosis.^[3]

This pathophysiological process is particularly relevant in neonates and infants, in whom the gastric wall is thinner and more susceptible to pressure-induced injury.^[2]

Although gastric pneumatosis has most commonly been described in association with gastric outlet obstruction, particularly in cases of hypertrophic pyloric stenosis, it has also been reported in less frequent scenarios such as duodenal atresia, annular pancreas, and other forms of congenital duodenal obstruction.^[8,9] These cases suggest that gastric pneumatosis should not be exclusively attributed to primary gastric pathology or systemic conditions such as necrotizing enterocolitis, but should also prompt consideration of mechanical causes of proximal intestinal obstruction.

In our patient, the identification of intramural gas within a grossly distended stomach on plain abdominal radiography was an important early diagnostic clue. While this radiologic finding is rare, its recognition may significantly expedite further diagnostic imaging, such as an upper gastrointestinal contrast study, and facilitate timely surgical intervention. Moreover, the co-occurrence of Down syndrome and signs of high gastrointestinal obstruction should heighten the clinician's suspicion for congenital anomalies such as annular pancreas, which may present with either complete or partial obstruction.

In conclusion, although rare, gastric pneumatosis can serve as an important radiological indicator of upper gastrointestinal tract obstructions. This finding, which results from mucosal injury due to increased intraluminal pressure, can play a diagnostic role, particularly in cases presenting

with nonspecific clinical symptoms. Thus, in the absence of systemic signs of sepsis or necrotizing enterocolitis, gastric pneumatosis should alert pediatric surgeons and radiologists to the possibility of an underlying anatomical obstruction. Early recognition and appropriate interpretation of this uncommon radiologic sign can prevent delays in diagnosis and improve clinical outcomes through prompt surgical management. Therefore, gastric pneumatosis should not be considered solely in the context of gastric outlet obstructions but also evaluated thoroughly for possible proximal duodenal pathologies.

Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

Author Contributions: All authors contributed equally to this article.

Conflict of Interest: The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

Funding: The authors received no financial support for the research and/or authorship of this article.

AI Disclosure: The authors declare that artificial intelligence (AI) tools were not used, or were used solely for language editing, and had no role in data analysis, interpretation, or the formulation of conclusions. All scientific content, data interpretation, and conclusions are the sole responsibility of the authors. The authors further confirm that AI tools were not used to generate, fabricate, or 'hallucinate' references, and that all references have been carefully verified for accuracy.

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