

# 12살 여자에서 과식 후 발생한 급성 원발 위 염전

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## Acute primary gastric volvulus occurring after overeating in a 12-year-old girl

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Gastric volvulus is a rare cause of recurrent abdominal pain or vomiting. This report presents a case of a 12-year-old girl with acute gastric volvulus and 2-hour history of epigastric pain after overeating. Computed tomography showed severe gastric distension without other abnormal findings. The gastric fluid decompressed through a nasogastric tube was approximately 4,000 mL in volume and non-bilious in color. Upper gastrointestinal series showed organo-axial volvulus without intestinal malrotation. Emergency laparotomy was performed. Because the color of stomach was pinkish, detorsion of the volvulus and gastropexy was performed. Postoperatively, the girl recovered uneventfully.

**Key words:** Abdominal Pain; Adolescent; Gastric Dilatation; Laparotomy; Stomach Volvulus; Upper Gastrointestinal Tract

### Introduction

Gastric volvulus is a rare disease caused primarily by laxity of the gastric ligaments, or secondarily by para-esophageal hernia or other diaphragmatic hernia<sup>1,2)</sup>. This entity is classified according to the axis of rotation. Organo-axial type is the volvulus that occurs when the stomach rotates along its long axis. The great curvature passes anteriorly

but is displaced posteriorly. In the less common mesentero-axial volvulus, the stomach rotates along the short axis, resulting in the antrum and pylorus lying antero-superior to the gastroesophageal junction<sup>1-5)</sup>. Acute gastric volvulus is a surgical emergency. A case of acute primary gastric volvulus in a 12-year-old girl is reported here with literature review, approved by the institutional review board of Dong-A University College of Medicine (IRB no. DAUHIRB-21-220).

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### Case

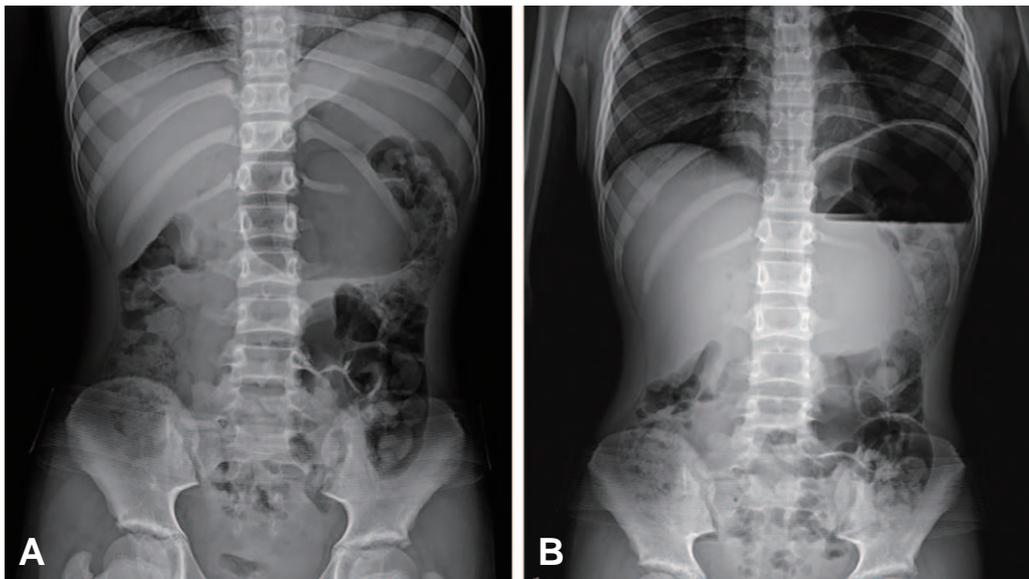
A previously healthy, 12-year-old girl visited the emergency department for abdominal pain lasting for 2 hours. Initial vital signs were as follows: blood pressure, 110/60 mmHg; heart rate, 78 beats

per minute; respiratory rate, 20 breaths per minute; temperature, 36.3°C, and oxyhemoglobin saturation, 98%. Initial physical examination showed a good appearance, and the soft and non-tender abdomen.

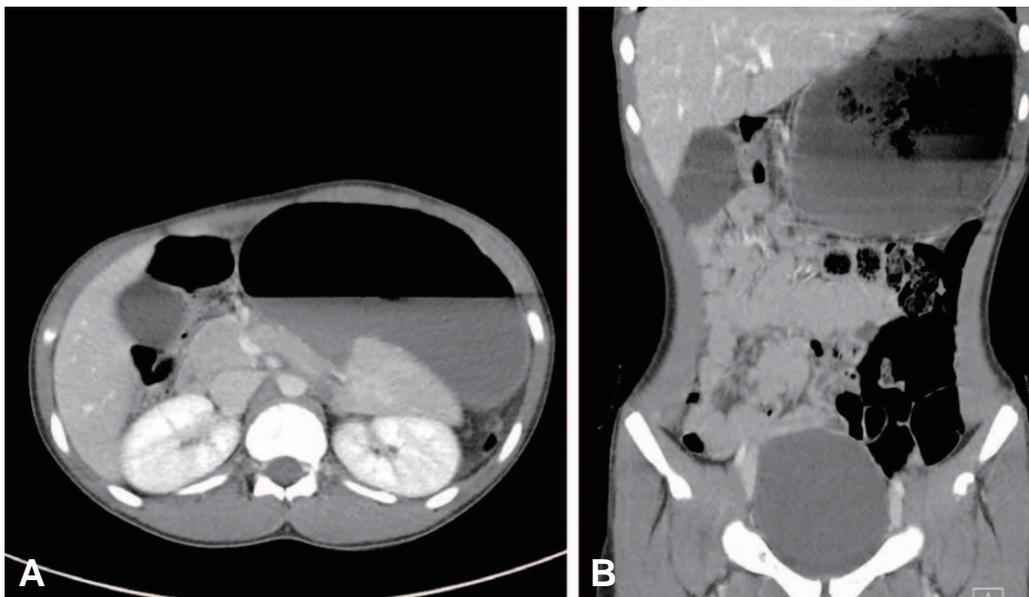
Laboratory findings, such as hemoglobin, C-reactive protein, amylase, lipase, and transaminases, were within the normal ranges. Plain radiographs

showed gastric distension with air–fluid level (Fig. 1). During the emergency department stay, her abdominal pain was aggravated. Computed tomography (CT) showed severe gastric distension without ischemia, mass lesion or inflammatory focus with the unclear duodenojejunal junction (Fig. 2).

Subsequently, a pediatrician obtained surgical consultation for acute gastric distension with



**Fig. 1.** Plain radiographs showing a gastric distension (supine, **A**) and air–fluid level (upright, **B**).



**Fig. 2.** Computed tomography scans (axial, **A**; coronal, **B**) showing a gastric distension without signs of ischemia, mass or inflammatory focus.

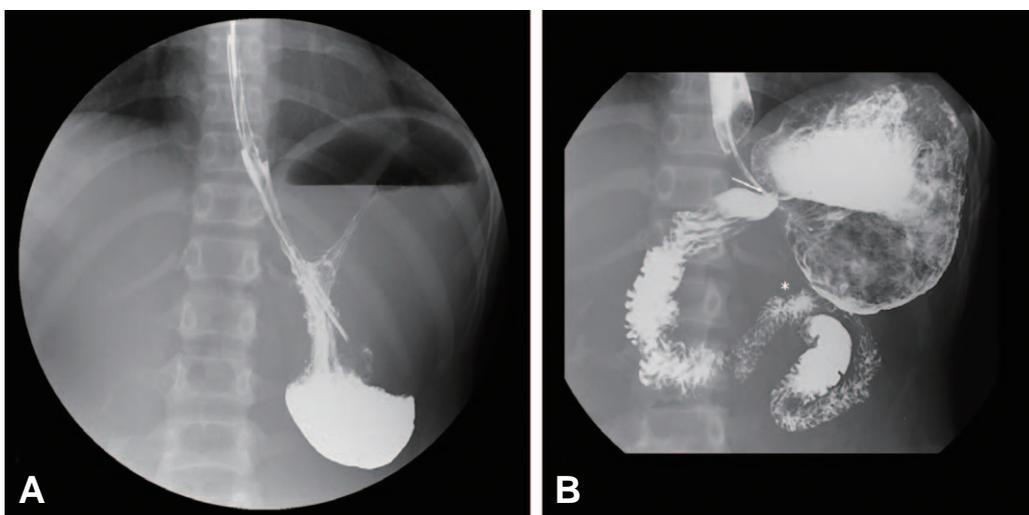
unknown causes. To relieve epigastric area tenderness with swelling noticed on a follow-up examination, a nasogastric tube was inserted to decompress the stomach. The gastric fluid decompressed through the tube was approximately 4,000 mL in volume and non-bilious in color. Given the unclear duodenojejunal junction on CT, upper gastrointestinal series (UGI) was performed to check the presence of partial intestinal malrotation. The UGI depicted a delayed gastric emptying with organo-axial volvulus (Fig. 3).

On emergency laparotomy, the stomach was severely dilated and edematous, but looked pinkish without a gangrenous change. The greater curvature folded upward and forward with the fundus rotated posteroinferiorly. The author carefully reduced the volvulus, and confirmed the absence of a secondary cause. For gastropexy, the anterior wall of gastric body was sutured to the peritoneum with multiple non-absorbable sutures to make a natural gastric location and to prevent a recurrence. The girl could take sips of water after 1 day of the surgery, and recovered uneventfully. During the 6-month follow-up, she had not reported discomfort and recurrence.

## Discussion

Gastric volvulus is an uncommon cause of non-bilious vomiting resulting from the rotation of the stomach. Darani et al.<sup>3)</sup> reported 21 children aged 6 days–4.3 years who underwent surgery for the volvulus from 1992 through 2003. A systematic review showed 125 children with the volvulus that occurred at a median age of 24 months and vomiting as the most common presenting symptom<sup>4)</sup>. While 65.6% of the volvulus occurred during the first 12 months of life, 8.1% was diagnosed at the age of 6–12 years<sup>5)</sup>. In Korea, several cases were reported<sup>6–12)</sup>. Although the most common symptoms are non-bilious vomiting, and abdominal distention and pain<sup>5)</sup>, this triad is also found in many other gastrointestinal diseases. Given the rarity and affected age range, it is difficult to consider the volvulus a differential diagnosis in adolescents with gastric dilatation and abdominal pain<sup>13)</sup>. In addition, overeating itself can radiographically show a gastric dilatation. A clue in the study patient was the unclear duodenojejunal junction on CT and the late-developing epigastric tenderness. In this case, the UGI finding prompted the correct diagnosis while excluding partial intestinal malrotation.

UGI and CT are helpful in diagnosing gastric



**Fig. 3.** Upper gastrointestinal series showing a delayed gastric emptying with organo-axial volvulus. A and B are the images of 7 and 10 minutes after administration of contrast material, respectively. B depicts an inversion of the greater and lesser curvatures, and the normal positions of the pylorus (arrow) and duodenojejunal junction (asterisk).

volvulus<sup>14</sup>). Chiefly, UGI can show a type of volvulus by passage of radiocontrast. Mesentero-axial type usually has a secondary cause whereas organo-axial type is more commonly primary<sup>15</sup>. An asymptomatic diaphragmatic anomaly can be often presented with acute gastric volvulus<sup>15</sup>, highlighting the need to pursue a secondary cause.

In many reports, gastric necrosis and/or perforation had occurred before surgery. Mortality of acute volvulus was 2.5-fold higher than that of chronic volvulus (6.7% vs. 2.7%)<sup>5</sup>. Timely surgery consists of detorsion of volvulus and gastropexy, leading to a favorable outcome. In a case of the necrosis or perforation, additional surgical procedures are needed. Secondary causes should be ruled out to prevent recurrences. The gastropexy, which the author performed, prevents an internal hernia through the space between the sutures<sup>16</sup>.

This case suggests that epigastric pain with gastric distension may be caused by gastric volvulus. Suspicion of this surgical disease can be proven

via UGI.

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## Conflicts of interest

No potential conflicts of interest relevant to this article were reported.

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## References

1. Porcaro F, Mattioli G, Romano C. Pediatric gastric volvulus: diagnostic and clinical approach. *Case Rep Gastroenterol* 2013;7:63-8.
2. Trecroci I, Morabito G, Romano C, Salamone I. Gastric volvulus in children-a diagnostic problem: two case reports. *J Med Case Rep* 2016;10:138.
3. Darani A, Mendoza-Sagaon M, Reinberg O. Gastric volvulus in children. *J Pediatr Surg* 2005;40:855-8.
4. da Costa KM, Saxena AK. Management and outcomes of gastric volvulus in children: a systematic review. *World J Pediatr* 2019;15:226-34.
5. Cribbs RK, Gow KW, Wulkan ML. Gastric volvulus in infants and children. *Pediatrics* 2008;122:e752-62.
6. Lee HS, Jung EJ, Park JS, Park T. Chronic Gastric Volvulus as a Late Complication of Hepatectomy for Hepatoblastoma in a Child: A Case Report. *Pediatr Gastroenterol Hepatol Nutr* 2019;22:608-12.
7. Koh CY. A case of mesentero-axial gastric volvulus presenting as recurrent vomiting of a children. *J Korean Soc Emerg Med* 2015;26:95-98. Korean.
8. Jung SY, Bong JG, Park JH, Park HY. Acute gastric volvulus and wandering spleen. *Korean J Gastroenterol* 2001;38:366-70. Korean.
9. Lee JT, Kim HJ, Kim HS, Tchah H, Park HJ, Kim HS. A case of gastric volvulus in a 3-year-old female. *Korean J Pediatr Gastroenterol Nutr* 2000;3:89-92. Korean.
10. Kim HH, Lee SK, Kim KH. A case of gastric volvulus. *J Korean Assoc Pediatr Surg* 2000;6:153-5. Korean.
11. Jeon HJ, Seo JC, Ko BS, Bae JH, Kim DH, Park SM, et al. A case of an organoaxial type of chronic gastric volvulus. *Korean J Gastrointest Endosc* 1998;18:713-8. Korean.
12. Park WH, Choi SO, Suh SJ. Pediatric gastric volvulus-experience with 7 cases. *J Korean Med Sci* 1992;7:258-63.
13. Espinola DC, Nankoe SR, Eslami PW. Acute gastric volvulus in a 16-year-old male adolescent: a case report. *Pediatr Emerg Care* 2017;33:34-7.
14. Gerstle JT, Chiu P, Emil S. Gastric volvulus in children: lessons learned from delayed diagnoses. *Semin Pediatr Surg* 2009;18:98-103.
15. Tillman BW, Merritt NH, Emmerton-Coughlin H, Mehrotra S, Zwiop T, Lim R. Acute gastric volvulus in a six-year-old: a case report and review of the literature. *J Emerg Med* 2014;46:191-6.
16. Takahashi T, Yamoto M, Nomura A, Ooyama K, Sekioka A, Yamada Y, et al. Single-incision laparoscopic gastropexy for mesentero-axial gastric volvulus. *Surg Case Rep* 2019;5:19.