

Gastric Volvulus in A Neonate With Omphalocele Treated With Scarification: A Case Report

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ABSTRACT

Background: Gastric volvulus is a rare but potentially life-threatening condition. Evaluating Borchardt's triad in neonates can be challenging and may be absent. Despite its rarity; if left untreated, it can result in a high mortality rate, necessitating immediate diagnosis and management.

Case Presentation: A newborn was diagnosed with an omphalocele. The patient was treated with scarification. During treatment, the patient consistently exhibited obstructive symptoms. A midline incision was made above the omphalocele ring, followed by encircling the ring to open the abdominal cavity. During surgery, grade 2-3 adhesions were identified on the greater curvature of the stomach, leading to organo-axial volvulus. Adhesiolysis was performed. The gastric volvulus occurred due to adhesions between the stomach and liver, which were connected to the omphalocele sac, leading to organo-axial volvulus. At the two-months follow-up after surgery, the patient has no obstructive symptoms and the surgical wound was in good condition.

Conclusion: Gastric volvulus in neonates can result from abnormal bands and adhesions on the stomach leading to axial twisting and volvulus. Gastric volvulus requires early diagnosis and immediate management, as delays can lead to complications that increase morbidity and mortality.

Keywords: gastric volvulus, omphalocele, scarification therapy, adhesions, case report.

1. INTRODUCTION

Gastric volvulus was first described by Berti et al. in 1866. Despite its rare incidence, gastric volvulus accounts for 21% of life-threatening conditions in neonates. Gastric volvulus involves an abnormal rotation of one part of the stomach relative to another, with twisting ranging from 180° to 360°, often associated with obstruction and a risk of strangulation. The twisting in gastric volvulus can be classified as organo-axial (54% of cases), mesentero-axial (41% of cases), or mixed (2% of cases) [1]. Classically, Borchardt's triad consists of vomiting without expulsion of gastric contents, epigastric distension, and the inability to pass a tube into the stomach [2]. However, Borchardt's triad is reported to occur in only 70% of cases [3]. According to Mortell and O'Connor (2018), assessing Borchardt's triad in infants is challenging and it may be absent. Despite its rarity, if left untreated, gastric volvulus has an 80% mortality rate, necessitating immediate diagnosis and management [1]. We report a case of gastric volvulus in a neonate with omphalocele treated with scarification. This manuscript was prepared following the CARE guidelines (<https://www.care-statement.org>).

2. CASE REPORT

A newborn was diagnosed with an omphalocele based on fetomaternal ultrasound. The patient was born via cesarean section at term (38-39 weeks) with a birth weight of 2,900 grams. Upon examination, the liver and bowel were herniated. A sac was present, with the umbilical cord inserting onto it. The defect was 4 cm in length with a 7 cm diameter, and the umbilical cord was located in the center (Figure 1). An orogastric tube (OGT) was inserted for decompression, and the patient was started on a gradual milk diet while being observed for signs of obstruction.



Figure 1

During treatment, the patient experienced obstructive symptoms. However, vital signs remained within normal limits. The omphalocele was treated with silver sulfadiazine for 20 days. A thoracoabdominal X-ray showed air predominance in the proximal part of the stomach and a paucity of distal bowel gas (Figure 2). The patient was subsequently scheduled for exploratory laparotomy.



Figure 2

Under general anesthesia and in the supine position, a midline incision was made above the omphalocele ring, which was then encircled to open the abdominal cavity. During surgery, grade 2-3 adhesions were identified between the greater curvature of the stomach, liver segment IV, and the omphalocele sac, causing organo-axial volvulus (Figure 3). Adhesiolysis

was performed, revealing a dilated stomach with smooth distal patency. No dilated or malrotated intestines were observed. The omphalocele defect was closed with primary sutures after undermining the fascia to accommodate closure of the abdominal cavity. Postoperatively, the patient had no obstructive symptoms and was able to gradually resume the milk diet over 30 days. The patient was discharged home at two months of age. During a two-months follow-up after surgery, the patient exhibited no obstructive symptoms, and the surgical wound was in good condition.



Figure 3

3. DISCUSSION

Gastric volvulus is an abnormal rotation of one part of the stomach relative to another, [4] with twisting ranging from 180° to 360°, often associated with obstruction and the risk of strangulation. Anatomically, the stomach is bounded proximally by the esophageal hiatus and distally by the pyloroduodenal junction, and is stabilized by ligaments such as the gastrohepatic, gastrosplenic, gastrocolic, and gastrophrenic ligaments. However, the shape and position of the normal stomach can change [1,5].

The classification of twisting in gastric volvulus includes: organo-axial, which occurs along an axis connecting the esophageal hiatus and pyloroduodenal junction, accounting for 54% of cases; mesentero-axial, which occurs along an axis connecting the midpoint of the greater and lesser curvatures, accounting for 41% of cases; and mixed types, which occur in approximately 2% of cases. Neonates and infants can experience this condition due to abnormal bands and adhesions involving the stomach [1]. However, in most cases, gastric volvulus in newborns is secondary to diaphragmatic defects [2,6]. Eventration of the diaphragm, sliding hiatal hernia, and Bochdalek hernias have all been reported in association with gastric volvulus [2].

In our case, a neonate with a giant omphalocele was found to have protrusion of the liver, stomach, and intestines, which were treated with scarification. This treatment could lead to adhesions between the omphalocele wall and intra-abdominal organs, including the stomach, resulting in gastric volvulus. In this particular case, gastric volvulus occurred due to adhesions between the stomach-liver to the omphalocele sac, which led to gastric volvulus.

Classically, Borchardt's triad consists of vomiting without the expulsion of gastric contents, epigastric distension, and the inability to insert a tube into the stomach [1]. Borchardt's triad is reported to occur in 70% of cases [3]. In our case, the patient did not exhibit Borchardt's triad; there was vomiting, but distension could not be evaluated due to the omphalocele, and a gastric tube could be inserted. This aligns with Mortell and O'Connor (2018), who stated that Borchardt's triad is challenging to assess in infants and may be absent. Continuous regurgitation and vomiting, sometimes non-productive, are common symptoms in neonates, although they are not specific [1]. Various factors can contribute to failure in inserting a gastric tube in neonates, and successful tube insertion does not rule out the diagnosis [7].

Chest and abdominal X-rays are crucial for diagnosis, as they can identify the presence or absence of hernia defect and gastric dilatation in abnormal areas, thus indicating the possibility of gastric volvulus [1]. A CT scan may be considered if plain films are inconclusive. In our case, the patient underwent plain chest and abdomen X-rays, which did not reveal any diaphragmatic hernia defects. However, the X-rays did show air accumulation in the proximal part of the stomach and a paucity of distal bowel gas, likely due to adhesions between the stomach-liver to the omphalocele sac, leading to partial obstruction.

Management of gastric volvulus requires appropriate resuscitation and urgent surgery to prevent ischemic necrosis and gastric perforation. Gastric decompression should be performed, but forceful tube insertion should be avoided due to the risk of gastric perforation [5]. The management approach depends on the presentation of the volvulus, the underlying cause, and the patient's general condition [1]. In our case, the patient had grade 2-3 adhesions between the greater curvature of the

stomach, liver, and the omphalocele sac, leading to organo-axial volvulus. Adhesiolysis was performed, and the outcome was satisfactory.

This case report describes a rare case of gastric volvulus in a neonate with an omphalocele, providing an overview of the clinical manifestations, surgical management, and postoperative outcomes. The strength of this study lies in the detailed description of a complex and rare case, along with the surgical approach and long-term follow-up, which can serve as a useful reference for clinicians handling similar cases. Additionally, this case report also highlights the importance of early diagnosis and intervention to prevent complications. The limitations of this study is the single-case design, which makes it difficult to generalize the findings to a broader population. Additionally, the retrospective design cannot see causality or compare treatment outcomes with alternative approaches. Despite these limitations, this case report adds important knowledge and understanding of neonatal gastric volvulus associated with omphalocele.

4. CONCLUSION

Gastric volvulus is an extremely rare disorder and a complex condition in terms of its etiology and management. Symptoms in neonates are often nonspecific, with the organo-axial type being the most common presentation. While this condition can be suspected clinically and on plain X-rays, an upper gastrointestinal (UGI) examination is recommended for a definitive diagnosis. An abdominal CT scan may be considered if plain films are inconclusive (e.g., paraesophageal hernia). In this case, gastric volvulus was found in a patient with an omphalocele treated with scarification (conservative therapy). Adhesions between the stomach and liver to the omphalocele sac led to gastric volvulus. Early diagnosis and immediate management of gastric volvulus are crucial, as delays can lead to complications that significantly increase morbidity and mortality in patients.

5. INFORMED CONSENT

Prior to data collection, the patient's guardian provided written informed consent for the publication of case report in academic journal. This consent included the understanding that personal identifiers would be removed to ensure patient confidentiality.

6. AUTHORSHIP

All author attest that they meet the current ICMJE criteria for authorship.

7. FUNDING

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8. CONFLICT OF INTEREST

None declared.

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