**DOI:** https://doi.org/10.5281/zenodo.20775382

**ISR Journal of Medical Case Reports (ISRJMCR)**

**Homepage:** https://isrpublisher.com/isrjmcr/

**Volume 02, Issue 02, February 2026** ISSN: 3107-5576 (Online)

# The Radiological Borchardt's Triad: Emergency CT Diagnosis of Acute Gastric Volvulus within a Hiatal Hernia

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## Article History

Received: 26-12-2025

Accepted: 19-02-2026

Published: 24-02-2026

**Abstract:** **Case Report**

Acute gastric volvulus represents a surgical emergency with a high mortality rate, often complicating giant hiatal hernias. While the clinical "Borchardt's Triad" provides strong initial suspicion, Multidetector Computed Tomography (MDCT) is essential to guide management. We report the case of a 95-year-old male who presented with classic Borchardt's triad: epigastric pain, unproductive retching, and the inability to pass a nasogastric tube. Urgent MDCT confirmed an incomplete (<180º) organo-axial volvulus within a massive hiatal hernia. Crucially, the absence of pneumatosis and the preservation of gastric wall enhancement allowed our team to confidently rule out ischemia. Given the patient's advanced age and radiological signs of gastric viability, a successful conservative approach was adopted. This case emphasizes that MDCT is not merely a diagnostic tool for identifying the "upside-down stomach," but a pivotal risk-stratification instrument that can prevent high-risk emergency surgeries in the elderly.

**Keywords:** Gastric Volvulus, Organo-axial Volvulus, Hiatal Hernia, Borchardt's Triad.



## INTRODUCTION

Gastric volvulus is a rare but potentially catastrophic event defined by an abnormal rotation of the stomach, typically exceeding 180 degrees [1, 2]. While primary forms exist, the condition most frequently arises secondary to diaphragmatic defects, such as paraesophageal hiatal hernias, which facilitate the intrathoracic migration of the stomach [3]. This rotation can create a closed-loop obstruction, rapidly spiraling into ischemia, necrosis, and perforation. The mortality rate for delayed diagnosis remains alarmingly high, ranging from 30% to 50% [1, 4].

Clinically, the diagnosis is often suspected via Borchardt's triad: acute epigastric pain, violent retching without vomiting, and failure of nasogastric tube (NGT) insertion [5, 6]. However, as this triad is present in only about 70% of cases, Multidetector Computed Tomography (MDCT) has become the gold standard for definitive assessment [8]. MDCT's role is dual: it must confirm the anatomical subtype and, more importantly, detect signs of "gastric suffering" that dictate whether the patient requires immediate surgery or can be managed conservatively [3, 8]. We present a case where MDCT findings guided a successful non-operative strategy in a nonagenarian.

### Case Report

A 95-year-old male with a history of hypertension presented to the Emergency Department with sudden, severe epigastric distress. Three days prior, the patient had suffered a minor head trauma following a fall, but his primary complaint on admission was excruciating pain and persistent, non-productive retching.

On examination, the patient was hemodynamically stable but tachycardic. Abdominal palpation revealed localized epigastric tenderness. A bedside attempt by the surgical resident to insert a nasogastric tube for gastric decompression failed, effectively completing Borchardt's clinical triad.

An urgent contrast-enhanced MDCT was performed. The imaging revealed a massive hiatal hernia with the majority of the stomach displaced into the posterior mediastinum **(Figure 1)**.

Detailed multiplanar reconstructions (MPR) identified an **organo-axial volvulus**, characterized by a rotation along the longitudinal (cardiopyloric) axis. This resulted in a "mirror image" of the normal gastric anatomy: the greater curvature was abnormally positioned superiorly and laterally, while the lesser curvature appeared inferior and medial **(Figure 2)**. Furthermore, the antropyloric transition point had migrated superiorly to the level of the fundus **(Figure 3)**.

Two key radiological findings were pivotal for the management plan:

1. **Preserved Viability:** The gastric wall showed normal, homogeneous contrast enhancement without wall thickening, pneumatosis, or free intraperitoneal air.
2. **Incomplete Torsion:** The degree of rotation was less than 180º, and no air-fluid levels were visualized within the herniated stomach, suggesting a non-occlusive twist.

Despite the mechanical obstruction, the surgical team—relying on the radiological evidence of gastric viability and considering the patient's age (95 years)—opted for a conservative approach. The patient was managed with bowel rest and supportive care, recovering fully without the need for high-risk emergency intervention.

**Figure 1: Axial contrast-enhanced MDCT image demonstrating a hiatal hernia containing the vast majority of the stomach within the posterior mediastinum**

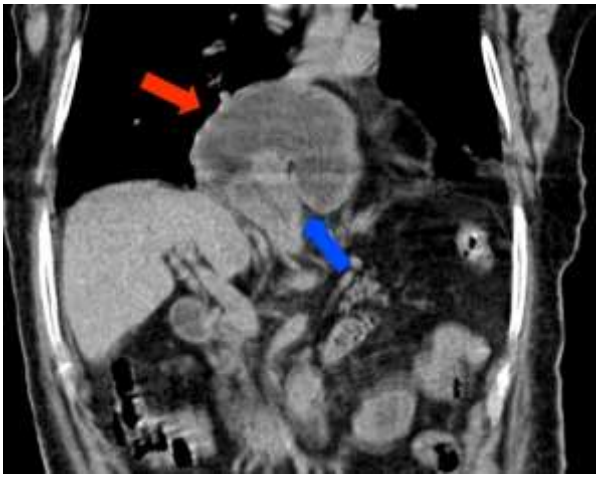

**Figure 2: Coronal multiplanar reconstruction (MPR) showing the stomach rotated along its longitudinal axis. Note the "mirror image" anatomy indicative of organo-axial volvulus: the greater curvature is abnormally positioned superiorly/laterally (Red arrow), while the lesser curvature is inferior/medial (Blue arrow)**

**Figure 3: Coronal MDCT image highlighting the abnormal anatomical relationships. The Red arrow indicates the antropyloric transition point, which has been displaced superiorly. The Blue arrow marks the gastric fundus, showing that the antrum/pylorus has migrated to the level of the fundus, confirming the rotational abnormality**

## DISCUSSION

Acute gastric volvulus remains a "surgical trap." Late recognition can lead to irreversible necrosis, yet emergency surgery in the very elderly carries its own prohibitive risks. In this case, the complete Borchardt's triad provided a pathognomonic clinical clue [5], but it was the MDCT that provided the safety margin for non-operative management [7].

**Anatomical Classification**

Organo-axial volvulus, seen in our patient, accounts for approximately 60% of cases and is highly associated with diaphragmatic defects [2, 6]. Unlike the mesentero-axial type (rotation around the short axis), the organo-axial type reverses the positions of the curvatures, creating the "mirror image" effect seen in intrathoracic migration [7, 9].

**The Radiologist as Risk-Stratifier**

A distinctive feature of our case was the incomplete rotation. Complete volvulus typically manifests with massive gastric distension and prominent air-fluid levels. The absence of these signs in our patient suggested that some luminal and vascular patency remained.

The most critical task for the radiologist is the assessment of gastric "suffering." As emphasized by Mazaheri *et al*., the lack of wall enhancement and the presence of perigastric fluid are highly specific markers for necrosis [7]. By confidently reporting preserved wall enhancement and the absence of pneumatosis, the radiologist allowed the surgeons to avoid an emergency laparotomy in a nonagenarian [3].

While surgery (detorsion and gastropexy) remains the traditional standard [1], this case aligns with recent literature suggesting that stable patients with confirmed gastric viability can be managed conservatively, especially when surgical risks are prohibitive [3].

**CONCLUSION**

Acute gastric volvulus within a hiatal hernia is a life-threatening event where clinical and radiological synergy is vital. MDCT is the cornerstone of the workup, moving beyond simple diagnosis to risk-stratification. Identifying the degree of torsion and, above all, the signs of gastric viability can fundamentally shift the clinical pathway toward safe conservative treatment in high-risk elderly populations.

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