Case Report

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Hour-Glass Stomach: A Case Report of a Rare Disease with Small Review of the Literature

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ABSTRACT

Hour-glass stomach, a rare anatomical variant characterized by a narrowed gastric segment, presents with significant clinical challenges, including postprandial pain, nausea, vomiting, and malnutrition. This report details two cases of hour-glass stomach and their surgical management. The first case involved a 58-year-old female presenting with persistent esophageal reflux and dyspepsia, initially treated with laparoscopic sleeve gastrectomy, subsequently revised to a Roux-en-Y gastrojejunostomy due to delayed gastric emptying. The second case was a 28-year-old male who presented with a hiatal hernia, abdominal pain, and vomiting, and who underwent a combined laparoscopic sleeve gastrectomy and Roux-en-Y gastric bypass in a single procedure. Both patients were diagnosed using radiographic imaging with water-soluble contrast. The surgical approach, combining sleeve gastrectomy to address the anatomical narrowing and Roux-en-Y bypass to improve gastric emptying, resulted in symptom resolution and no recurrence at 2-month follow-up. This case series highlights the efficacy of this surgical strategy in managing hour-glass stomach and emphasizes the importance of radiographic imaging for diagnosis and postoperative assessment. Further studies with larger patient cohorts are needed to establish standardized treatment protocols and long-term outcomes.

Introduction

There is a wide variation in the shape and position of the stomach related to physiological disorders of gastric motility and emptying. Clinically, three types of stomachs may exist: sthenic, hypersthenic, and hyposthenic. The sthenic type, characterized by a “J”-shaped stomach, is considered the typical anatomical variant. The hypersthenic type, called the “steer-horn stomach,” is commonly affected by duodenal ulcer. The hyposthenic or asthenic type is mostly vertical and is associated with a high risk of gastric ulcers [1]. Among the variant shapes, the hour-glass stomach is one of the well-known types [2]. Patients affected often complain of pain in the hypogastric abdominal region immediately after eating, accompanied by nausea and vomiting, leading to progressive malnutrition. This significantly interferes with feeding, and symptoms gradually worsen, potentially even leading to death [3]. This rare condition has an unknown prevalence

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and is scarcely described in the literature. We present our two cases of hour-glass stomach and their surgical treatment.

Case presentation

The first patient was a 58-year-old female with a Body Mass Index (BMI) of 22 kg/m², with no particular comorbidities, who came to our attention for persistent reflux and dyspepsia. Computed Tomography (CT) of the abdomen, esophagogastroduodenoscopy (EGD), and bowel transit study were all normal. A Gastrografin swallow test revealed a normally distended, hypotonic, and "hour-glass" shaped stomach for the first time (Figure 1). She underwent laparoscopic atypical stomach resection (sleeve gastrectomy), calibrated on a 40Ch probe and performed with a linear stapler in 68 minutes, without intraoperative complications.

During the first postoperative day, due to an episode of vomiting, the patient underwent a CT abdomen scan with contrast, followed by an X-ray of the digestive tract with Gastrografin per os and EGD, which showed delayed gastric emptying. She therefore underwent laparoscopic revision, and a mechanical gastroenterostomy according to Roux-en-Y was performed in 94 minutes, with the anastomosis created 30 cm from the Treitz. The biliopancreatic loop was constructed 30 cm from the alimentary loop. The remainder of the postoperative stay was uneventful, and a Gastrografin swallow test was performed before hospital discharge (Figure 2).

The second patient was a 28-year-old male with a BMI of 23 kg/m², without comorbidities, who presented with a small hiatal hernia causing abdominal pain, bloating, acid reflux, and vomiting. He was diagnosed with an hour-glass atonic stomach after a Gastrografin swallow test (Figure 3). pH-manometry and EGD were performed before surgery. Based on prior experience, he underwent laparoscopic sleeve gastrectomy and Roux-en-Y gastric bypass with a linear stapler, according to the dual-loop technique (feeding loop at 30 cm from the Treitz and biliopancreatic loop at 30 cm from the previous one). Operative time was 95 minutes. A Gastrografin swallow test was performed on the first postoperative day, showing no contrast leakage and normal gastric emptying (Figure 4).

Upon discharge, both patients resumed feeding without any problems. The median hospital stay was 7.5 days (range 2–15). Follow-up was performed about one week after discharge, and both patients were in good general clinical condition. They reported no problems, and symptoms had disappeared. One-month follow-up was unremarkable in both patients. Histological examination revealed no major alterations for either patient. Two-month follow-up did not reveal any recurrence of disease.

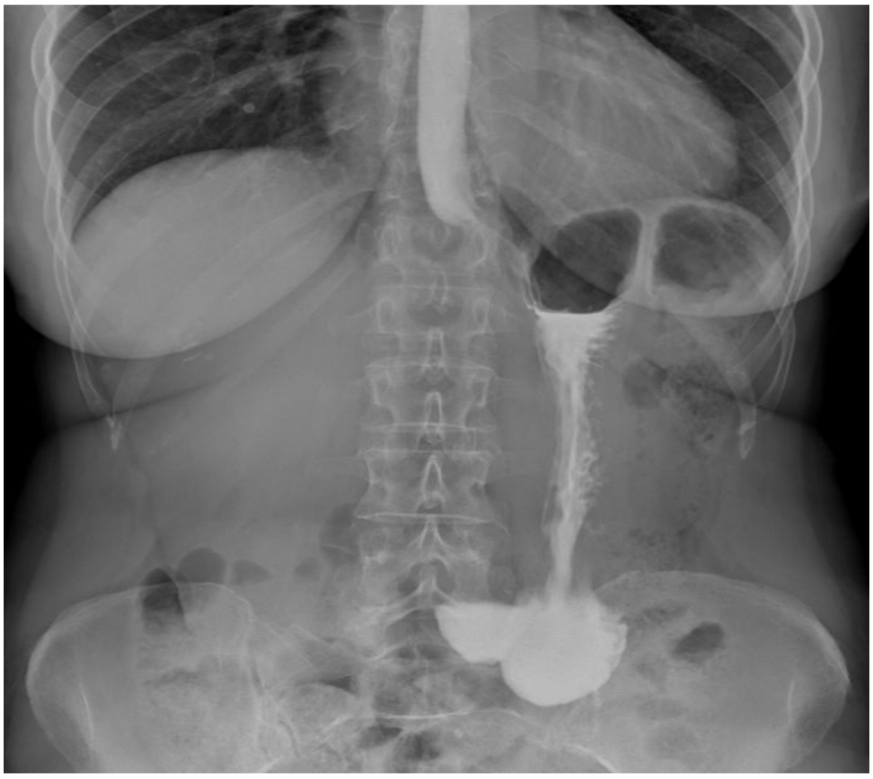

Fig. 1. Case 1: Gastrografin swallow test before surgery.

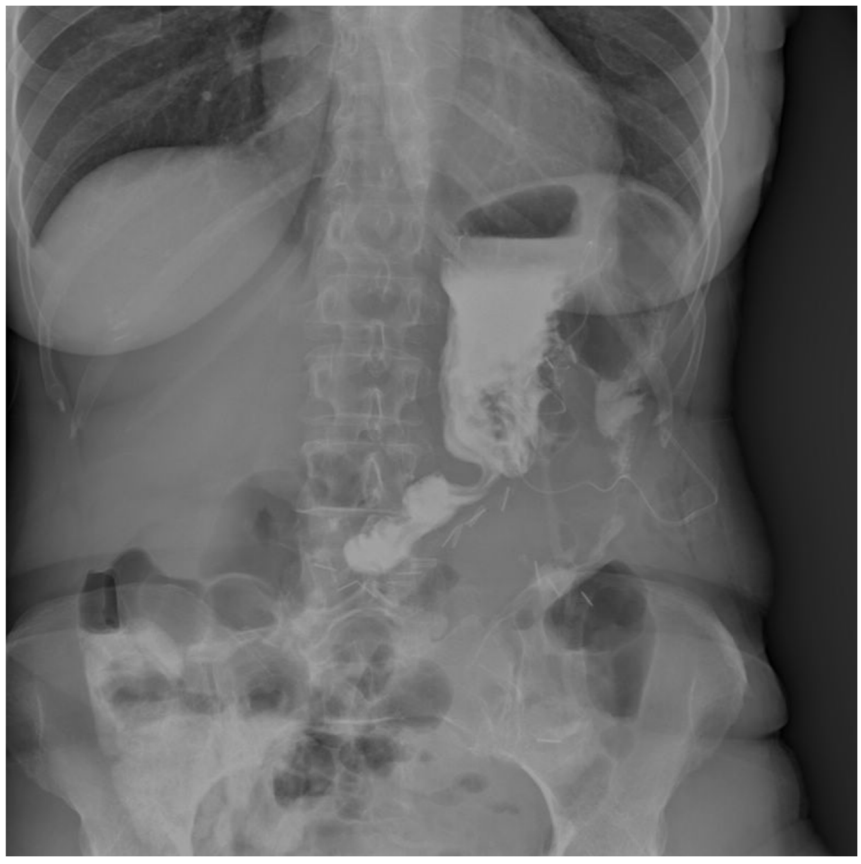

Fig. 2. Case 1: Gastrografin swallow test after surgery.

Fig. 3. Case 2: Gastrografin swallow test before surgery.

Fig. 4. Case 2: Gastrografin swallow test after surgery.

Discussion

Hour-glass stomach is a rare disease, difficult to diagnose or often undiagnosed, but it compromises the quality of life of these patients. It is challenging for the surgeon to manage this pathology, as there are few cases in the literature that are treated with different surgical techniques. This pathology was first mentioned in 1904, when B.G.A. Moynihan described its etiology and treatment. He wrote that hour-glass stomach may be congenital or acquired. The congenital form is more frequent, and in about 45% of the cases neither ulcers nor scar tissue were detectable. It may result from an incomplete development of the muscular layer, because the bundles are generally half an inch or more in width and cross at the point of narrowing in the stomach. It is hypothesized that the contracting of these muscle fibers determines the typical form of the stomach. The causes of acquired hour-glass stomach are three: perigastric adhesions, chronic ulcers, and malignant disease. The 15 cases described in his paper were treated by gastroplasty, gastro-enterostomy, gastro-gastrostomy, or a combination of these surgical techniques [4].

Discovering hour-glass stomachs post-mortem was not uncommon. In 1906, Dr. A.E. Orr described his experience in the autopsy room: he found the anatomical anomaly in an elderly, well-developed, and rather tall female; it was the second case in his career (about 600 bodies dissected) [5].

A. Primrose in 1914 wrote in his report that, whatever type of surgery is performed, the main objectives are to remove the part of the stomach involved in the disease and to provide the best prevention of further problems related to subsequent contraction along the suture line [6].

In 1949, C. Morrison Schroeder reported a case of a 74-year-old white male with postprandial pain but no vomiting, who on February 10, 1948 was treated with a partial gastrectomy of the distal two-thirds of the stomach, down to the pyloric ring, with the histological diagnosis of “annular constriction due to muscular hypertrophy,” showing that hypertrophy of the muscular layers of the stomach in the proximal portion of the antrum caused an annular constriction partially dividing the stomach into two compartments, giving rise to an hour-glass appearance [7].

Therefore, we can state that regardless of the cause and type of treatment chosen, the goal must be to resolve the patient’s symptoms or, in some

cases, the underlying cause of this condition. In our department, based on our experience as a high-volume bariatric surgery center, we opted to perform sleeve gastrectomy combined with Roux-en-Y Gastric Bypass. This choice was motivated by the need to address both the anatomical alteration and functional disorders of the stomach. Sleeve gastrectomy removes the narrowed portion of the stomach, while Roux-en-Y Gastric Bypass creates a new passage for food, overcoming the obstruction and improving gastric emptying. This surgical combination has proven effective in reducing or eliminating symptoms of abdominal pain, nausea, and vomiting, significantly improving patients' quality of life. We have found that an X-ray to study bowel transit with a water-soluble contrast is very helpful in diagnosing this condition as well as in the postoperative period.

Conclusion

Hour-glass stomach is rare, and diagnosis is a challenge. This condition significantly impairs patient quality of life. While historical literature describes various surgical approaches, our experience suggests that a combined laparoscopic sleeve gastrectomy and Roux-en-Y Gastric Bypass can effectively address the anatomical abnormality and alleviate patient symptoms. The use of X-ray with water-soluble contrast proved to be a valuable and cost-effective diagnostic tool, both preoperatively and postoperatively, in visualizing the stomach's morphology and assessing gastric emptying. Notably, the successful outcomes in these two cases, with resolution of symptoms and no recurrence at 2-month follow-up, highlight the potential benefits of this surgical strategy in managing hour-glass stomach. Further research with larger patient cohorts is warranted to establish standardized treatment protocols and to better understand the long-term outcomes of these surgical interventions. Additionally, continued awareness and accurate diagnosis of this rare condition are crucial for timely and effective patient management.

Ethical Considerations

Compliance with ethical guidelines

There were no ethical considerations to be considered in this article.

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Conflict of Interests

The authors have no conflict of interest to declare.

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