

# Incarcerated Paraesophageal Hernia Associated with Perforation of the Fundus of the Stomach: Report of a Case

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**Abstract** We report herein a case of incarcerated paraesophageal hernia associated with perforation of the fundus of the stomach. A 71-year-old woman was transferred to our hospital after a diagnosis of gastrointestinal tract perforation had been made at a local hospital. Her history included an esophageal hiatal hernia. A laparotomy was performed which revealed that the antrum of stomach and the duodenal bulb had prolapsed into the esophageal hiatus and become incarcerated. This prolapse had caused stenosis in the corpus of the stomach, resulting in distension of the oral side of the stomach and thinning of the wall. A perforation, 15 mm long, was recognized in the major curvature of the fundus. The patient suffered respiratory failure postoperatively, necessitating respiratory support for 1 week. She was discharged on postoperative day 40. This case report serves to demonstrate that because of the very serious complications that may result from an untreated paraesophageal hernia, elective repair should be performed wherever possible even in asymptomatic patients.

**Key words** Paraesophageal hernia · Gastric perforation

## Introduction

Paraesophageal hernias occur most commonly in elderly women and account for 5% or less of all hiatal hernias.<sup>1</sup> Although the fundus or corpus of the stomach are most commonly the contents of a paraesophageal hernia, we report a case in which the gastric antrum prolapsed and became incarcerated in the paraesophageal space, followed by perforation of the proximal part

(fundus) of the stomach, which freely existed in the abdominal space.

## Case Report

A 71-year-old woman was admitted to a local hospital following the sudden onset of abdominal pain and distension. Because intraperitoneal free air was recognized on a plain abdominal X-ray film, she was transferred to our hospital with the diagnosis of gastrointestinal tract perforation. She had a history of abdominal distension being caused by an esophageal hiatal hernia, which had been decompressed with a nasogastric tube. On examination, marked abdominal distension with mild tenderness was recognized. Her pulse rate and blood pressure were 112/min and 130/80 mmHg, respectively. The initial laboratory investigations revealed the following results: hemoglobin, 12.3 g/dl; white blood cell count, 15800/μl; glutamic oxaloacetic transaminase, 751 IU/l; glutamic pyruvic transaminase, 274 IU/l; total bilirubin, 0.4 mg/dl. An abdominal X-ray showed extensive free air and an unusual gas shadow in the left thorax (Fig. 1). A computed tomography scan demonstrated intraperitoneal free air, ascites, and the prolapsed stomach in the left thorax. The distal portion of the gastrointestinal tract returned to the abdominal cavity. The perforation point was not able to be determined preoperatively (Fig. 2). An emergency laparotomy was performed the same day, revealing dirty ascites containing a lot of aliment in the abdominal cavity. The antrum of the stomach and the duodenal bulb had prolapsed into the esophageal hiatus and become incarcerated. The incarcerated part was reduced by manipulation and marked edema was evident (Fig. 3a). This prolapse had caused the development of stenosis in the corpus of the stomach, following which the oral side of the stomach had become distended and thin. A perforation measuring 15 mm in length was recognized in the major curvature

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of the fundus (Fig. 3b). After irrigation with isotonic sodium chloride solution, the site of perforation in the stomach was taken out with the surrounding gastric wall using a linear stapler. We also turned the hernia sac

inside out and reefed the orifice. Microscopically, the perforated wall was necrotic without ulceration. The patient required respiratory support for 1 week after the operation, but was discharged on postoperative day 40. No further signs of hiatal hernia have been recognized by gastrointestinal series carried out in the outpatient clinic.

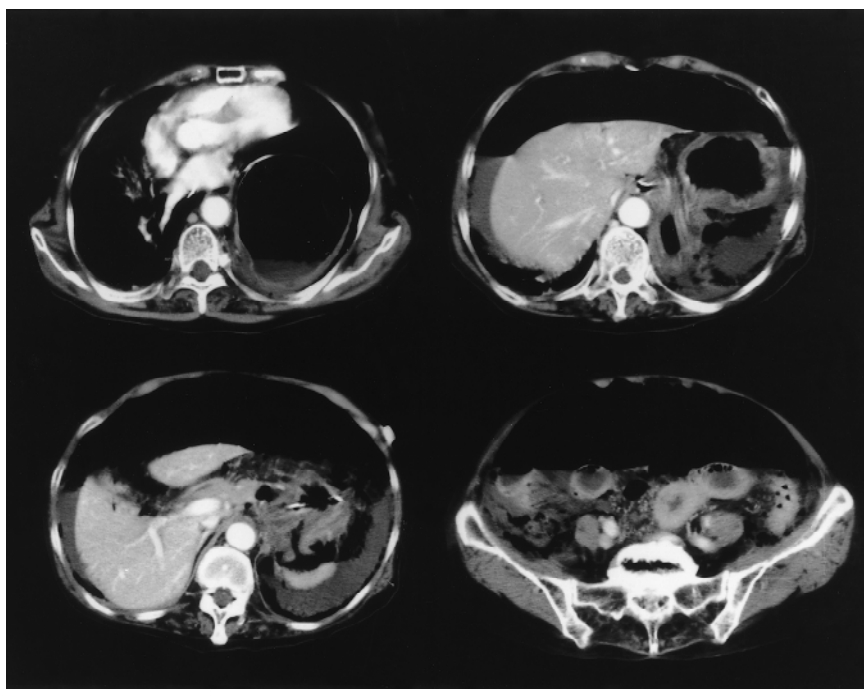
### Discussion

The contents of a paraesophageal hernia commonly include the gastric fundus or corpus. When the defect is large, the entire stomach rotates upward, leading to the so-called upside-down stomach.<sup>2</sup> Very few cases of antrum prolapse, as in our patient, have been reported, all of which manifested as obstruction in the stomach.<sup>2</sup> To our knowledge this is the first report of perforation in the proximal part (fundus) of the stomach, which was not incarcerated, but freely existed in the abdominal cavity.

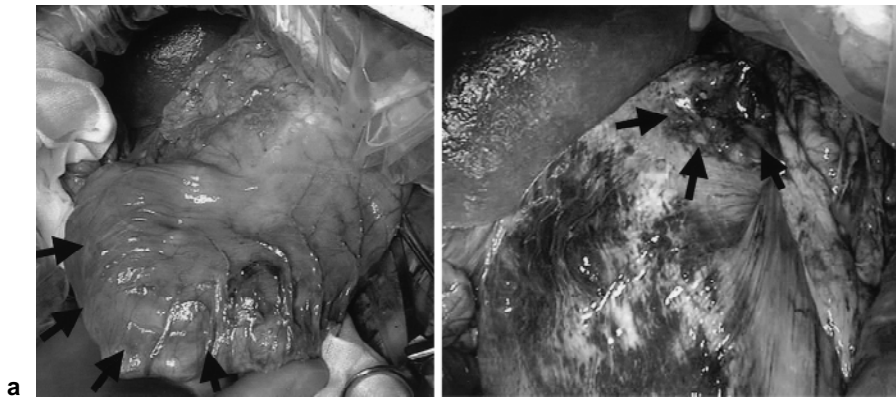
The perforation in our patient was similar to spontaneous gastric ruptures at preschool age in terms of the site, namely, the major curvature of the fundus, and the shape, being round without an ulcer.<sup>3</sup> Some authors suggested the causative factors for gastric rupture in preschool-age children to be ischemia of the gastric wall<sup>4</sup> and elevated intraluminal pressure.<sup>3</sup> In our patient, the antrum of stomach and the duodenal bulb had prolapsed through the esophageal hiatus in the upper gastrointestinal series 1 year 8 months prior to the



**Fig. 1.** Abdominal X-ray showing extensive free air and an unusual gas shadow in the left side of the chest



**Fig. 2.** Abdominal computed tomography revealing intraperitoneal free air, ascites, and the stomach prolapsing into the left thorax



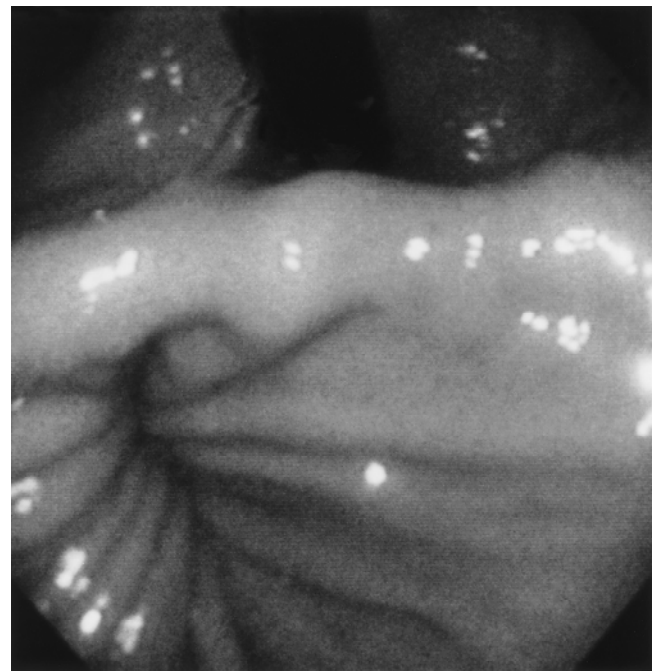
**Fig. 3.** **a** The antrum of the stomach and the duodenal bulb prolapsed into the esophageal hiatus and became incarcerated. Marked edema can be seen around the incarcerated portion (*arrows*). **b** The perforation measured 15 mm and was recognized in the major curvature of the fundus (*arrows*)



**Fig. 4.** Contrast radiography performed 1 year 8 months prior to perforation showed the prolapsed antrum of the stomach and the duodenal bulb projecting through the esophageal hiatus

surgical emergency (Fig. 4). Furthermore, a stenosis of the stomach had been recognized by gastric fiberscopy at the local hospital to which she had initially presented (Fig. 5). We assume that the pressure had gradually been elevated by chronic stenosis, until rupture finally occurred.

According to a report by Hill, 3.5% of all cases of herniation through the esophageal hiatus were of the



**Fig. 5.** Stenosis of the stomach had been recognized by a gastric fiberscopy performed at the local hospital

paraesophageal type; however, incarceration developed in 10 of 29 patients with paraesophageal-type herniations, showing an incidence of 30.4%.<sup>5</sup> Paraesophageal hernias can cause lethal complications, including gastric obstruction,<sup>5</sup> gastric strangulation with or without perforation,<sup>6</sup> gastric ulceration,<sup>7</sup> and gastric hemorrhage. Furthermore, perforation of the stomach on the oral side of the stenosis (as in our patient) is possible.

Paraesophageal hernias can usually be repaired easily, even using the most recent laparoscopic technique.<sup>8</sup> Thus, because of the very serious potential complications inherent in cases such as ours that can result from an untreated paraesophageal hernia, we recommend that elective repair be carried out, even in asymptomatic patients.

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