A 42-year-old man was brought to the hospital late one evening because of severe dyspnea. During the day of admission he had become increasingly short of breath and agitated. There was no history of cough, sputum production, wheezing, or chest trauma. Physical examination disclosed a tachypneic, mildly obese man with temperature of 99.6°F (37.5°C), blood pressure 150/90 mm Hg, and pulse 180 per minute and regular. His trachea was deviated severely to the left. Absent fremitus, hyperresonance to percussion, and decreased breath sounds were noted over the right upper chest. Figure 1 is a portable AP chest roentgenogram obtained on admission.

*From the Departments of Medicine, Boston University School of Medicine and the Boston Veterans Administration Hospital. Supported in part by Pulmonary Special Center of Research Grant HL15063-04 National Heart and Lung Institute.

**Fellow, Pulmonary Medicine Section, Boston University School of Medicine.

†Professor of Medicine, Boston University School of Medicine.
Diagnosis: Acute gastric dilatation associated with foramen of Morgagni hernia

Figure 1 demonstrates a huge hyperlucent pocket that fills the right upper hemithorax and extends inferiorly and medially across the midline into the left thorax. The trachea and the mediastinal structure are greatly deviated into the left hemithorax. The appearance resembles a tension pneumothorax except that the hyperlucency is surrounded by a wall approximately 1 cm thick and spares the right apex. In addition, the right lower hemithorax is occupied by a large opacity that obscures the right hemidiaphragm and contains various-sized radiolucencies.

On listening again with the stethoscope over the right lower hemithorax, a few bowel sounds were heard. A nasogastric tube was then passed and a quantity of gas was aspirated, quickly relieving the patient's symptoms. Subsequently, an upper gastrointestinal series revealed herniation of the stomach and loops of large and small bowel through a large anterior opening in the right hemidiaphragm (Fig 2 and 3).

The foramina of Morgagni are two small symmetrical triangular spaces, the bases located anteriorly and formed by the sternum. Each space is limited medially by the sternal portion of the diaphragm and laterally by the costal portion of the diaphragm in the region of its attachment to the seventh costal cartilage. The space is covered on the thoracic side by the parietal pleura and on the abdominal side by the diaphragmatic peritoneum. It is filled with loose connective tissue. The terminal branches of the internal mammary vessels pass through it.

In 1769, Morgagni gave the first description of a hernia through one of these spaces. Hernia through the foramen of Morgagni accounts for approximately 3 percent of all diaphragmatic hernias proven surgically. The great majority are on the right, since the left space is reinforced by the pericardium. Although these spaces are structurally weak from birth, herniation is infrequently encountered until later in life. Predisposing factors include alteration of connective tissue with age, obesity, pregnancy, and chronic constipation. In patients under age 50 years, the hernia occurs predominantly in men; over age 50, they predominate in women.

Although more than 70 percent of the proven cases reported contained some portion of the gastrointestinal tract, the literature suggests that the most common structure to herniate is extraperitoneal fat or omentum. These fat-filled hernias present roentgenographically as smooth rounded opacities obscuring the right cardiophrenic angle in the frontal chest film. A lateral film usually demonstrates an anteriorly placed density with a convex upper border. When omentum has herniated, a barium enema characteristically shows the transverse colon kinked upwards in an inverted V position especially on an upright film. The colon is the most common viscus to herniate through the space, followed by stomach, liver, and small bowel, in order of decreasing frequency.

Clinical symptoms from Morgagni hernia are relatively uncommon, and are primarily gastrointestinal in origin. The diagnosis is suspected from the roentgenographic demonstration of an anterior right cardiophrenic angle mass. When liver is above the diaphragm, scintigram may disclose hepatic herniation. A fat-filled hernial sac may be difficult to identify with certainty; diagnostic pneumoperitoneum may
sometimes confirm the diagnosis, but a negative examination does not exclude the possibility. The differential diagnosis of a homogeneous, anteriorly located mass at the right cardiophrenic angle includes lipoma, teratoma, lymphoma, thymoma, pulmonary neoplasm, hydatid disease, localized empyema, pleural cyst and pericardial cyst.6,10

Surgical intervention is usually recommended when a hollow viscus has herniated through the foramen of Morgagni because of the possibility of obstruction or strangulation. It is often performed when the hernial sac is homogeneous and the diagnosis is uncertain, to rule out tumor.11

Obstructed hernia is not rare through other openings in the diaphragm, eg, the foramen of Bochdalek, esophageal hiatus and traumatic diaphragmatic tear. The latter accounts for 80-90 percent of the cases and the hiatal hernias for 10-20 percent. Only occasionally does one of the congenital types become obstructed.12

Obstructed hiatal hernia is usually associated with the large sliding variety. Gastric volvulus occurs with a twist of 180° or more along the cardiopyloric axis. The distal stomach replaces the proximal segment in the thorax and the greater curvature lies above the lesser.13 The precipitating cause of the volvulus is unknown. The plain film often shows air-fluid levels in the mediastinum and the left upper abdomen. The diagnosis can be made by opaque contrast roentgen studies in the majority of cases; the distal stomach almost always lies within the hernia and the esophagus enters the stomach below the diaphragm. Gastric intubation should be attempted and is successful in relieving the obstruction in nearly half the patients. Surgery is recommended for all patients; however, as the volvulus tends to recur and the operative mortality is raised significantly in obstructed cases.12

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