

# Right retrocostoxiphoid gastro-colo-thorax

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## ABSTRACT

*Morgagni hernia – anteromedial herniation of abdominal contents into the thoracic cavity through a congenital parasternal defect of the diaphragm – is uncommon in adults, accounting for only 3% of all treated diaphragmatic hernias.*

*We report a rare case of a 73-year-old woman presenting abundant vomiting which led to dehydration and functional renal insufficiency caused by a gastric volvulus in a large anterior diaphragmatic hernia containing omentum, transverse colon and the antral portion of the stomach.*

*The diagnosis was achieved with esophagogastrography and a spiral CT. Repair by transabdominal approach was successfully carried out without complications.*

*The paper refers to the etiopathogenesis, clinical symptoms, diagnostic, and therapeutic considerations for Morgagni hernia.*

**Key words:** Morgagni hernia, diaphragmatic hernia, gastric volvulus

## INTRODUCTION

**C**iovanni Battista Morgagni was the first author who described the anterior diaphragmatic hernia in 1769 (1). Other synonymous names for this type of hernia are: retrocostoxiphoid, subcostosternal, retrosternal, or parasternal hernia (2). It is the least common of all the diaphragmatic hernias and comprises only 3% of all cases. It is almost always congenital, it is usually asymptomatic in

the first few years of life and it may be associated with other congenital anomalies (3).

The hernia occurs through a retrosternal defect of the diaphragm, caused by failure of complete fusion between the sternal and costal portions of the muscle (4). This allows herniation of abdominal viscera covered in a peritoneal sac in the thorax. Of the herniated organs the most commonly found are the greater omentum and the transverse colon. The stomach, small intestine, or even the liver may also be involved. The defect is most often found lateral to the

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sternum; however, the complete aplasia of the sternal part of diaphragm produces a median defect, situated just posterior to the xiphoid process (3).

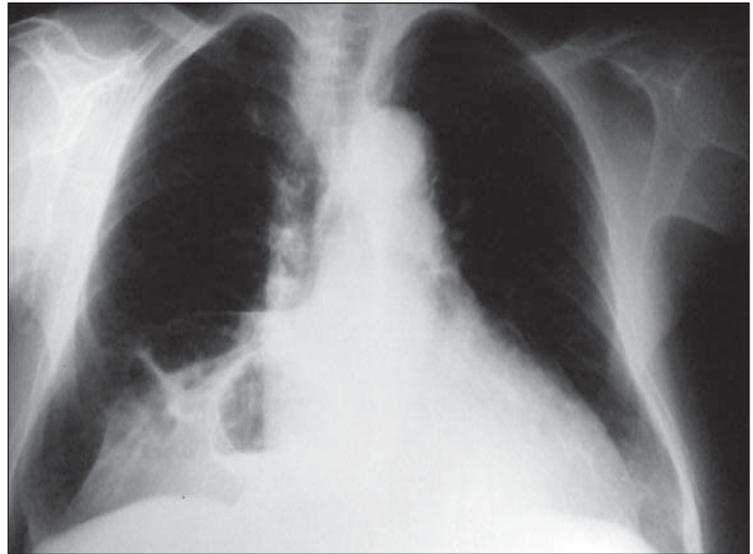
Although the anterior diaphragmatic defect is congenital, Morgagni hernia presents in adult life when factors like obesity or sustained effort promote herniation by increasing intraabdominal pressure. In adult patients, women are more commonly affected (3). The hernia is more commonly found on the right side, cases with bilateral presentation are extremely rare (5).

Patients may be diagnosed incidentally at a radiological examination for unrelated problems, 50% to 70% of patients are asymptomatic (5). In adults it commonly presents with minimal symptoms even in the case of large hernias, although acute forms with bowel obstruction can occur (3). Symptoms, when they do occur, can be mixed – abdominal and thoracic: epigastric or retrosternal pain, dyspnea, coughing, cardiac arrhythmia, nausea, bloating, constipation (6). The absence of any apparent hollow viscus within the sac can create difficult problems of radiological differential diagnosis (3). One must have a high level of suspicion to diagnose a congenital diaphragmatic hernia, especially in older patients, and to abstain from performing invasive procedures (thoracentesis, drainage) which can lead to injury of an herniated abdominal organ. For clarification barium studies, magnetic resonance imaging or high resolution computed tomography can be necessary.

Differential diagnosis should be made between: pleuropericardial cysts, lipomas, liposarcoma, mesothelioma, pulmonary sequestration, hydatid cysts of the lung, teratomas, hiatal hernia, Chilaiditi syndrome, basal pleural effusion, diaphragmatic cysts and tumours, anterior chest wall tumours (6,7).

Surgical repair is the treatment of choice, even in asymptomatic patients, because of the possible occurrence of complications such as: hernia incarceration, bowel obstruction, strangulation, or gastric volvulus (5).

Diaphragmatic repair can be performed by: primary suture in small defects, suture of the diaphragm to the ribs or to the posterior rectus sheath, in children plastia with transverse abdominal muscle flap (the Rivers- Baker procedure) or by using a prosthetic mesh (2). □



**FIGURE 1.** Posteroanterior chest x-ray – an inhomogeneous opacity with hydroaeric levels located in the right costodiaphragmatic angle

### CASE PRESENTATION

We are presenting the case of a 73-year-old woman admitted in “Dr. Carol Davila” Nephrology Hospital – Bucharest with the diagnosis Acute renal insufficiency from dehydration, presenting epigastric, mostly postprandial pain, nausea, repeated, abundant vomiting, weight loss – 20 kg in 6 month. Results of laboratory studies were significant for: hypokalemia ( $K^+$  – 3,19 mEq/l), elevated blood urea nitrogen of (62 mg/dL), uric acid (6.4 mg/dL) and creatinine (1.29 mg/dL).

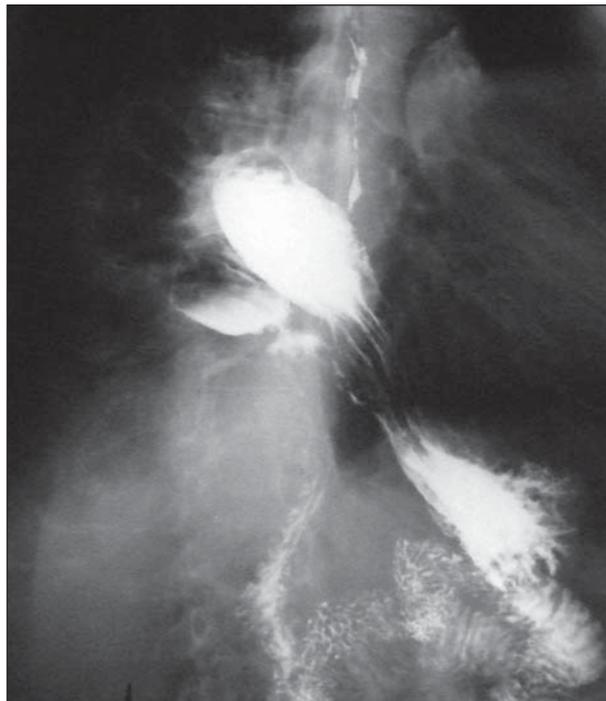
Posteroanterior radiographic evaluation (FIGURE 1) revealed an inhomogeneous opacity with hydroaeric levels located in the right costodiaphragmatic angle.

An upper endoscopy was performed, which showed: esophagus with a normal caliber and path, several areas of submucosal venous dilatation, the esogastric junction was situated at 44 cm from the incisors, the gastric cavity was grossly enlarged, with mucosal alterations compatible with chronic gastritis; at 15 cm from the esogastric junction there was a circumferential narrowing (possibly at the crossing of the diaphragm), the pylor was at 90 cm from the incisors, there were no duodenal alterations.

With the diagnosis: Large transdiaphragmatic gastric hernia, Secondary dyspeptic syndrome, Prerenal acute renal failure from dehydration, the patient was discharged and transferred to the Thoracic Surgery Department of the



**FIGURE 2.** Barium esophagram – intrathoracic herniation of the gastric antrum



**FIGURE 3.** Barium esophagram – intrathoracic herniation of the gastric antrum

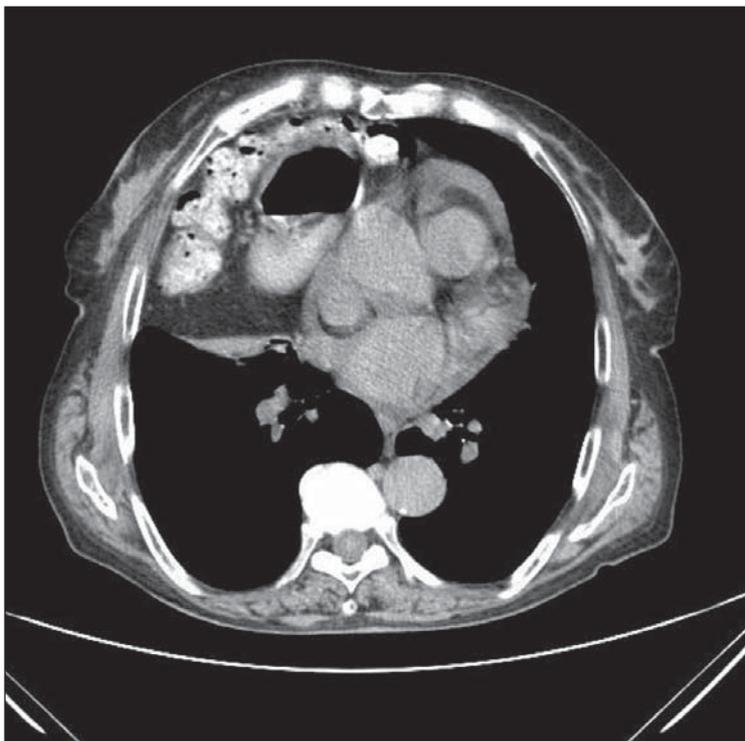
Emergency Central Military Hospital for surgical treatment.

The barium esophagram done in our department (FIGURE 2, FIGURE 3) revealed the

intrathoracic herniation of the gastric antrum.

A high resolution computed tomography of the thorax and upper abdomen (FIGURE 4, FIGURE 5) showed a large retrosternal diaphragmatic hernia through the space of Larrey, containing the antral portion of the stomach and the transverse colon; a 12 cm diaphragmatic defect; a 12 mm hepatic serous cyst in segment 4; a 10 mm thick pericardial effusion and a 23 mm partially calcified thyroid nodule in the left lobe.

Surgical indication being absolute and the moment optimum for operation (remission of the renal insufficiency) we decided to go on with the surgical intervention with the following objectives: reduction of the herniated viscera in the abdominal cavity, resection of the hernia sac and repair of the diaphragmatic defect. We made an upper midline laparotomy and found intrathoracic herniation of the gastric antrum, of the transverse colon and the epiploon through a 10/5 cm retrosternal defect of the diaphragm (FIGURE 6). The abdominal viscera were easily reduced (FIGURE 7). Dense adhesions between the hernial sac and surrounding tissues, suggesting a longstanding hernia, lead to a very difficult resection of the peritoneal sac. The dissection was made without opening the right pleural cavity. The diaphragmatic defect was sutured with interrupted,



**FIGURE 4.** HRCT scan – the antral portion of the stomach and the transverse colon above the right hemidiaphragm

nonabsorbable sutures passed over the ribs (FIGURE 8, FIGURE 9). The visceral mediastinum was drained with a tube connected to an underwater-seal drainage with a negative suction of -10cm H<sub>2</sub>O and the peritoneal cavity with two tubes (supra and infrahepatic). As the last surgical step, the abdomen was closed in anatomic layers. The patient had an uneventful recovery and was discharged 6 days after surgery. □

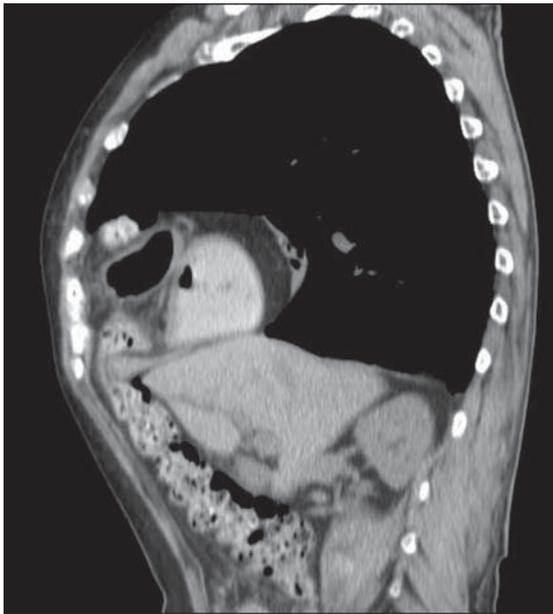


FIGURE 5. HRCT – sagittal reconstruction - showing the diaphragmatic defect



FIGURE 7. Reduction of the herniated viscera



FIGURE 8. Diaphragmatic defect repair



FIGURE 6. The retrocostoxiphoid hernia

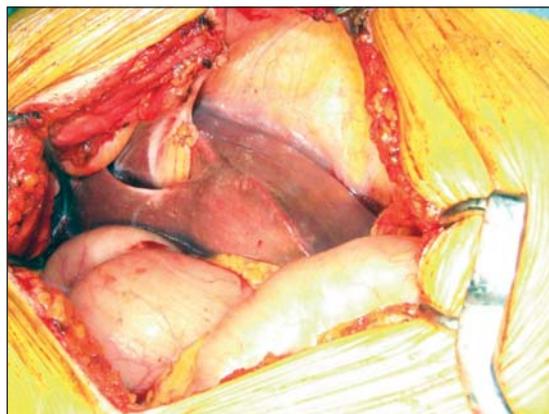


FIGURE 9. Final surgical aspect

**DISCUSSIONS**

Morgagni hernias represent the most rare type of diaphragmatic hernias. The

majority of them present after middle age with the exception of the large ones, of those detected on prenatal ultrasound scan or by early symptomatology. Most of them can be

repaired through a transabdominal approach without the use of a mesh because of the low recurrence rate (3).

The transabdominal approach is favoured when the diagnosis is certain as it allows an easier reduction of the herniate viscera. It is the preferred approach for bilateral hernias (1), complicated hernias with strangulation as it allows surgical treatment of the complications resulting from strangulation (6). Another advantage of the transabdominal approach is that it permits repair of the associated congenital abdominal anomalies. Difficulties in resection of the hernial sac were cited as a disadvantage of this approach (2).

The transthoracic approach can be used especially when the diagnosis is uncertain. It provides a wide exposure and easy resection of the hernia sac. It is the preferred approach in large, longstanding hernias in which dense adhesions can pose great difficulties. Through this approach it is sometimes very hard to reduce the contents of the hernia and to repair the diaphragmatic defect (2).

Minimally invasive approaches were also described, by laparoscopy, toracoscopy, separated or combined, with their advantages: reduction in trauma and postoperative pain, a faster recovery (1). Their indications are limited to: smaller, uncomplicated hernias, with a reduced diaphragmatic defect. They can also be used as exploratory tools in cases with uncertain diagnosis.

One thing to consider is the attitude versus the hernial sac, some authors do not remove the sac especially in laparoscopic operations, to avoid the apparition of pneumomediastinum (8). We always recommend the resection of the

sac to avoid fluid accumulation and the formation of a mediastinal cyst.

Once more we emphasize the necessity of routine chest x-ray examinations, indispensable in the diagnosis of clinically inapparent thoracic affections. Thus we can detect an asymptomatic retrosternal hernia.

The high resolution computed tomography was very useful in making the diagnosis. It is an effective imagistic tool which allows three-dimensional reconstruction, thus being very helpful for the positive radiological diagnosis, especially in small hernias with a difficult differential diagnosis. Another, cheaper method, that can confirm the presence of hollow abdominal viscera in the thorax are the barium studies. Magnetic resonance imaging can be useful in assessing the integrity of the diaphragm allowing the observation of a defect at this level.

The presented case is special due to the advanced age of the patient, the uncharacteristic onset, the presence in the hernia sac alongside the omentum of the transverse colon and of the antral portion of the stomach. The severity of the symptoms, incoercible vomiting which led to patient dehydration and functional renal insufficiency plead for the apparition of a complication – gastric volvulus. The lack of adhesions between the herniated viscera sustain the intermittent character of the herniation with the organs sliding in and out of the sac which lead to gastric volvulus and the acute onset of the symptoms.

The herniation of the gastric antrum was resolved just by reducing this gastric segment in the abdominal cavity without using subdiaphragmatic gastric fixation. □

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