

# Giant hiatal hernias – case report

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## ABSTRACT

Giant hiatal hernias with massive displacement of abdominal organs into the thoracic cage are known as non-typical hiatal hernias. They can occur with few clinical symptoms across many years, which often makes the diagnosis difficult. The method of choice for diagnosis is computer tomography.

We present 4 cases of a giant hiatal hernia. Three out of 4 patients have been operated on because of an obstruction in the upper digestive system, whereas 1 had elective surgery. In all cases, we performed a fundoplication with good results and no mortality.

**Keywords:** hiatal hernia; laparotomy; fundoplication; diaphragmatic hernia; stomach; intestinal obstruction.

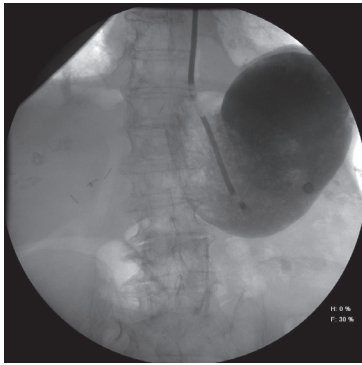
## INTRODUCTION

Hiatal hernia may be a congenital or acquired condition where the stomach and other abdominal organs translocate into the middle compartment of the chest through a hole in the diaphragm. It is commonly divided into 3 types – paraesophageal, sliding, and mixed type. Some sources claim that giant hiatal hernias, in which at least 30% of the stomach volume translocates into the thorax, constitute a 4th separate type of hiatal hernia [1]. An overwhelming majority of hiatal hernias are of the sliding type (over 90%), characterised by the displacement of the stomach along the cardiac orifice to the chest area [2]. This mechanism results in the stomach contents leaking backwards into the esophagus, leading to typical symptoms of hiatal hernia – heartburn and chest pain, occurring postprandially and when in lying positions, alleviated after elevating the upper body. Less common symptoms include dysphagia, nausea, and vomiting [3, 4, 5, 6, 7]. Infrequent are cases of paraesophageal hernia which causes eructation and a feeling of compression in the upper abdomen and chest area. Risk factors for developing a hiatal hernia include, among other things: being female, old age, and spine deformations [8, 9]. When discussing diaphragmatic hernias, it is also worth mentioning the traumatic hernias occur as a result of a rupture in the diaphragm due to injury to the thoracic cage, the abdomen or both of those combined [10]. In patients receiving preventive treatment for an injury with a rupture of the diaphragm, the defects of the diaphragm can remain undetected for many years. It is not uncommon for the hernia to manifest itself only after trapping the internal organs in the hernial ring. In the case of blunt trauma, the diaphragm defects are usually bigger in size, with substantial translocation of the abdominal organs to the thoracic cage [11]. The following article compiles 4 cases of clinical patients with giant hiatal hernias, hospitalized, and operated on at the Department of General, Minimally Invasive and Gastroenterological Surgery, part of the Pomeranian Medical

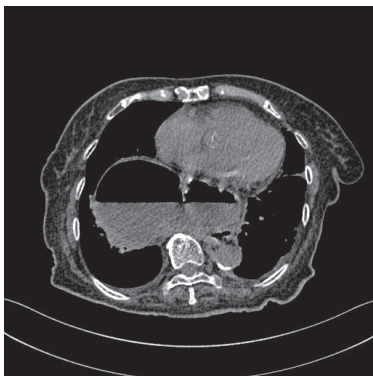
University in Szczecin. The article summarizes the patients' cases and compares the risk factors to their perioperative period and possible early and later complications.

## CASE 1

A 93-year-old woman (initials K.P.) was admitted to the clinic on an emergency basis. During an interview, the patient reported nephrolithiasis, suspicion of left adrenal adenoma, type II diabetes, arterial hypertension, spondyloarthritis, and cholecystectomy. Initially, the patient was admitted to the Gastroenterology Department in order to monitor for the signs of gastrointestinal obstruction. She had experienced vomiting digesta in recent days, weight loss (5 kg over 6 months), lack of appetite, and chronic constipation. On admission, the patient was dehydrated, with epigastric pain and signs of dysuria. Laboratory tests showed moderate microcytic anaemia, hypokalemia, hypoalbuminemia, and raised markers of inflammation. An X-ray scan showed no signs of gastrointestinal obstruction but found an extensive hiatus hernia (Fig. 1). The contents of the hernial sac included the body and the prepyloric region of the stomach along with the duodenal cap (the stomach mildly distended, the duodenum narrow, partially filling up with contrast medium; the insignificant amount of the contrast medium in non-dilated intestinal loops – partial duodenal obstruction). The CT scan of the chest with epigastric assessment showed a hiatal hernia with rings of approx. 135 mm, including  $\frac{2}{3}$  of the stomach body, the pyloric antrum, and a fragment of the descending duodenum (which was significantly compressed); a dilated, s-shaped stomach with fluid content retained (Fig. 2). Based on the performed examinations, the patient was qualified for accelerated surgery. Initially, the patient was disqualified by the anaesthesiology team due to age, accompanying burdens, and the high risk of perioperative complications.



**FIGURE 1.** X-ray of the gastrointestinal passage using contrast medium in the stomach



**FIGURE 2.** Computed tomography – cross-section through a dilated stomach with residual fluid content

The patient was prepared for surgery – ionic disorders and protein deficiencies were corrected, red blood cells were transfused, and total parenteral nutrition and antibiotic therapy aimed at urinary tract infection were started. After the patient was prepared and re-qualified, the surgery was performed on the 14th day after admission to the hospital – laparotomy was performed. The entire stomach was visualized intraoperatively with the starting segment of the duodenum in the thoracic region. The stomach was freed from adhesions in the chest and pulled into the abdominal cavity, revealing a large hiatal hernia. Five single sutures were placed on the crura of the diaphragm, and then a partial fundoplication was performed.

The course of the surgery was uneventful. Full parenteral nutrition was continued for 2 more days. On the 1st day after surgery, a liquid diet was introduced, and on the 2nd day, oral nutrition was introduced with good tolerance. The postoperative period was complicated by fluid in the left pleural cavity (puncture on the 4th postoperative day). The patient was discharged home in good general condition on the 10th day after the surgery.

## CASE 2

A 67-year-old patient (initials L.S.) was admitted to the clinic on a scheduled basis for a hiatal hernia repair. The patient complained of periodic chest pain, burning, and heartburn

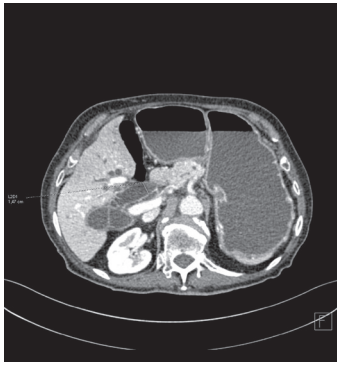
that had lasted for several months prior. Additionally, during an interview, she reported suffering from hypertension, type II diabetes, and having undergone post-aortic valve surgery 11 years prior. In an outpatient CT examination of the chest, an extensive 85 x 64 mm periesophageal hernia was described, with a part of the stomach intersecting above the diaphragm and a significant deterioration of the kyphosis of the thoracic spine. Due to the cardiovascular burden, the patient was consulted cardiologically as part of the qualification for surgery and informed of the possible adverse events.

After the patient was prepared, a surgical procedure (laparotomy) was performed. Half of the stomach was visualized intraoperatively – the rest of the stomach, together with the spleen, was in a hiatal hernia. Numerous adhesions connecting the diaphragm to the upper edge of the spleen and adhesions of the fundus with the diaphragm were released, and a part of the stomach along with the spleen were gently pulled into the abdominal cavity. The lesser curvature of the stomach was dissected at a distance of 6 cm, and the inferior vena cava and the right diaphragm limb were visualized. The esophagus was secured with a rubber band and the left crus of the diaphragm was dissected. Due to numerous adhesions and the impossibility of safely transporting the spleen to the abdominal cavity, the organ was removed. A fragment of the tail of the pancreas and the left adrenal gland were dissected, displaying the hiatus in its entirety. Five sutures were placed to close the esophageal hiatus, the dissected fundus was pulled under the esophagus, and then 4 fixation sutures were placed, performing full fundoplication using the Nissen method.

The perioperative period went without complications. On the 1st day after surgery, a liquid diet was introduced. On the 2nd day, oral nutrition was introduced with good tolerance. The patient, once in good general condition, was discharged home on the 6th day after the surgery.

## CASE 3

An 83-year-old patient (initials K.C.) was admitted to the department on an emergency basis due to a high obstruction of the gastrointestinal tract. She complained of pains in the upper abdomen and chest for about 5 months prior, increasing regurgitation (up to 1.5 L at a time), and constipation. Her medical history included a cardiac pacemaker implantation. A CT scan of the abdominal cavity showed signs of high mechanical obstruction of the gastrointestinal tract as a result of a sliding hiatal hernia, in which the pylorus, bulb, and the upper and the descending part of the duodenum were moved to the chest; with subsequent massive residual fluid in the stomach. Additionally, the scan illustrated the part of the head of the pancreas, a fragment of the omentum and the gastroepiploic vessels – all penetrating the hernia. The other part of the duodenum in the area of the ampulla of Vater was tucked upwards, where it was compressed by the diaphragm crus, followed by the massive dilatation of the bile ducts (Fig. 3). The patient was qualified for accelerated surgery.



**FIGURE 3.** Computed tomography – cross-section through a dilated stomach with residual fluid content. The dilated bile ducts are marked (147 mm)

The patient was prepared for surgery and on the 3rd day of hospitalization, laparotomy was performed, with the removal of the displaced organs from the chest to the abdominal cavity and hiatoplasty using the Nissen's fundoplication method.

The perioperative period was uneventful. On the 1st day after surgery, a liquid diet was introduced, and on the 2nd day the patient was given oral nutrition with good tolerance. Postoperative X-ray passage examination showed the correct position of the stomach and the correct flow of the contrast medium to the distal parts of the gastrointestinal tract (Fig. 4). The patient in good general condition was sent home on the 4th day after the surgery.



**FIGURE 4.** X-ray passage of the gastrointestinal passage a day after the surgery – correct flow of the contrast medium

#### CASE 4

A 74-year-old patient was transferred from a centre with a lower referral level to a clinical centre. Initially, he had been brought to the Surgical Emergency Room by the Emergency Medical Team due to 4-day-lasting dysphagia. The patient complained of vomiting after each attempt to eat solid foods and pain localized in the epigastric region. He reported a history of arterial hypertension and hemicolectomy due to transverse colon cancer. The documentation provided by the patient included a CT scan of the abdominal cavity, which described an extensive hiatal hernia of the diaphragm measuring 108 x 70 mm with the displacement of a significant part of the stomach into

the chest, including the antrum; dilated stomach with liquid content and air retained inside. The patient was qualified for surgery under an accelerated procedure.

The patient was prepared for surgery. On the 3rd day of hospitalization laparotomy with fundoplication was performed. After the abdominal cavity was opened, numerous peritoneal adhesions were released, and then half of the stomach was removed from a very large hiatal hernia. The diaphragm crura were dissected free, a thick probe was inserted into the esophagus, and then several individual sutures were placed to close the hiatus. The procedure was completed with a fundoplication using the Nissen method.

The perioperative period was uneventful. On the 1st day after surgery, fluids were introduced and on the 3rd day – well-tolerated oral nutrition. The patient in good general condition was discharged home on the 4th day after the surgery.

#### DISCUSSION

The foregoing case study confirms the general epidemiological data concerning hiatal hernia incidence [8, 9]. Three of the 4 operated patients were female, the mean age being 79.25 years, one of which had a spinal deformity. The advanced age of the patient is a perioperative risk factor in the case of giant hiatal hernia surgery [12], but the decision to qualify patients for surgery in the aforementioned cases was due to the life-threatening condition – gastrointestinal obstruction in 3 out of 4 patients. In 1 patient, the procedure of translocation of the abdominal organs from the thorax coincided with a splenectomy. In all cases, oral nutrition was implemented a few days after the surgery with normal intestinal transit. Only 1 patient developed postoperative complications related to comorbidities.

According to the literature, carrying out a full diagnostic process that includes the following examinations: chest X-ray, CT, and X-ray image with the passage of the gastrointestinal tract [13], turns out to be crucial in planning the scope and the extent of the surgical procedure. The final decision on the method and the extent of the surgery depends on the patient's clinical condition and the stage of the underlying disease [14]. Our department has experience with operating on smaller-sized hiatal hernias incorporating a classic laparoscopic method. Due to the profile of the department dealing with bariatric surgeries, a significant number of patients undergoing surgery for a hiatal hernia are patients qualified for other procedures. As such, it is not uncommon for our patients to undergo sleeve gastrectomy or mini-gastric bypass with simultaneous hernia repair, with good results. In view of the above, it is reasonable to carry out endoscopic diagnosis as part of qualification for bariatric surgery, not only because of gastroesophageal reflux disease, but also because of the hiatal hernia, which according to the literature can occur in as much as 40% of the patients qualified for bariatric surgery [15]. Numerous reports from centers dealing with this type of surgery seem to affirm this as well [6, 16, 17, 18]. However, in the case of large hernias with additional symptoms of acute gastrointestinal obstruction,

laparotomy seems to be safer for patients. As such, the cases described in this paper deserved to be presented given their course, unique for this type of disease.

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