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Case Report / Приказ болесника

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Larrey diaphragmatic hernia in an adult

Лареова дијафрагмална кила код одрасле особе

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SUMMARY

Introduction Larrey hernia is a very rare type of the left sided parasternal congenital hernia with the incidence of 1–3% of all anterior diaphragmatic hernias.

Case report The paper describes Larrey congenital diaphragmatic hernia in an adult female patient, aged 70. Seventeen years earlier, the patient had had problems with intermittent left side chest pain, hypertension, dyspnea, shortness of breath, fatigue and abdominal discomfort. She had no past surgical history, and no traumatic rupture of the diaphragm. An open surgical repair was conducted, reducing the herniated organs back into the abdominal cavity, and closing the diaphragmatic defect, repaired with a non-absorbable suture. During the immediate postoperative period, as well as 6 months later, the patient had a remarkable postoperative recovery.

Conclusion Larrey hernia represents an extremely rare kind of the anterior diaphragm hernias, which can be symptomatically manifested in older people over 65 years of age. The **t**reatment in the cases of asymptomatic and symptomatic Larrey hernias is a surgical intervention

Keywords: Larrey hernia; Morgagni hernia; Adult diaphragmatic hernia; open rapairn

САЖЕТАК

Увод Лареова хернија је врло редак облик предње левострана парастерналне конгениталне киле са инциденцом 1–3% свих предњих дијафрагмалних кила.

Приказ случаја Приказан је случај појаве Лареове киле код женске особе старе 70 година. Седамнаест година имала је проблеме са повременим боловима у левој страни грудног коша, хипертензију, диспнеју, замор и нелагодност у трбуху. Пацијенткиња није пре тога оперисана нити је имала повреду дијафрагме. Оперисана је отвореним приступом, са враћањем органа из грудног коша у трбушну дупљу, са затварањем дијафрагмалног отвора нересорптивним концем. Током непосредног постоперативног периода као и шест месеци после, пацијенткиња је имала уредан клинички ток.

Закључак Лареова кила је изузетно ретка врста предње дијафрагмалне киле, која се симптоматски може манифестовати и код особа старијих од 65 године живота. Третман код асимптоматских и симптоматских Лареових кила је хируршка интервенција

Кључне речи: Лареова кила; Моргањијева кила; дијафрагмална кила код одраслих; отворени приступ

INTRODUCTION

Larrey hernia represents an exceptionally rare type of left sided congenital diaphragmatic hernia, with an incidence of 2% of all anterior diaphragmatic hernias with intra-abdominal organ prolapse into the chest cavity, through the so-called “Hiatus Larrey” or the left sternocostal triangle. It usually symptomatically manifests later in life. Beside the left-sided one, there is also a hernia called Morgagni right-sided anterior congenital hernia, which occurs more frequently, in 90% of cases, and a hernia called Morgagni–Larrey’s hernia, which is bilateral, and the incidence of which is around 8% (Figure 1) [1–3].

CASE REPORT

We report a case of a female of 70, suffering from intermittent left side chest pain, hypertension, dyspnea, shortness of breath, fatigue and abdominal discomfort. She had had no past surgical history and no traumatic rupture of the diaphragm. The difficulties occurred

seventeen years earlier, in the form of intermittent heart palpitations and arrhythmia symptoms. During the last six months, she has complained about vague thoracic and abdominal discomfort with mild dyspnea in exertion.

On admission, the woman was hemodynamically stable, and the laboratory analyses were within normal limits. She was examined at The Clinic for Digestive Surgery. Preoperative computed tomography revealed a large segment of transversal colon herniating into the left hemithorax, causing a partial compression of the lung (Figure 2). The patient was operated on under general anesthesia, upper and midline laparotomy was done with a herniated omentum, and the transverse colon was reduced into the abdomen (Figures 3 and 4).

A 6 × 3 cm defect was identified just behind the xiphisternum, through which a part of the omentum and transverse colon herniated into the left hemithorax.

After confirming viability, by inspection and palpation, the contents were reduced back into the abdomen. The diaphragmatic defect was repaired and the plication of the diaphragm was performed with an interrupted suture (Figure 5).

The postoperative course was normal, without complications, and the patient was discharged from hospital on the eight postoperative day. Six months after the operation, during a control examination, the patient was feeling well and a remarkable reduction of symptoms was noticed. The control CT scan was normal (Figure 6).

DISCUSSION

Diaphragmatic hernia is a weakness of the diaphragmatic wall that allows the passage of the abdominal organs into the chest cavity. According to the cause of occurrence, it is mainly congenital but, in 7% of the cases, it can also be acquired as a consequence of trauma with a rupture of the diaphragm. According to the place of origin, congenital hernias can be classified as Bochdalek hernia, located posterolaterally, and Morgagni–Larrey or Morgagni–Larrey anterolateral hernia, located parasternally, retro-chondrosterally, or in the retrocostoxyphoid region [4].

Larrey hernia represents an exceptionally rare type of congenital diaphragmatic hernias. It occurs as a consequence of a failure of fusion in the anterior portion of the pleuroperitoneal membrane, resulting in the appearance of the left-sided defect in the retrosternal part of the diaphragm, called "Hiatus Larrey", or the left-sided sternocostal triangle [1]. It was named after the surgeon of Napoleon Bonaparte, Dominique Jean Larrey (1766–1842) who first described it in 1829, while analyzing the alternative ways in the treatment of pericardial tamponade [4]. Beside Larrey's hernia, a more frequent congenital diaphragmatic hernia is the Morgagni's one, localized on the right side, and named after the famous Italian anatomist and pathologist from Bologna, Giovanni Battista Morgagni. He described it in his study *De sedibus et causis morborum per anatomen indagatis* (*On the seats and causes of disease investigated by anatomy*) in 1761 [5]. In the case where hernia is present bilaterally, it is called Morgagni–Larrey [6].

The incidence of congenital hernias is 0.3-0.5/1000 in newborns, while Bochdalek hernia occurs in 1/2200 childbirths. In cases of the front, or anterolateral ones, it is 1/1,000,000 of childbirths [7]. Depending on the existence of the hernia sac, it is possible to classify them into so-called "true" and "false" hernias. The true hernias, where hernia sacs are present, occur as a consequence of the disorder in the development of the diaphragm during the fetal period, when the closure of the pleuroperitoneal hiatus occurs, but the migration of muscle is missing. In this case, the increased intra-abdominal pressure moves organs from the abdominal into the chest cavity, together with peritoneal evagination, which represents a hernia sac. The "false hernias" occur in the embryonic phase of development, when the closure of the pleuroperitoneal hiatus is missing, so the movement of intra-abdomen organs into the chest cavity is not followed by the peritoneum, with a subsequent lack of the hernia sac [4].

In general, the symptoms of anterolateral hernias occur during childhood, with respiratory symptomatology, while in only around 2-3% of the cases, they manifest in adults, mainly around the age of 58 in the female population, and around the age of 50 in the male population [8].

In the review and analysis of 298 cases, Horton et al. [9] indicate 28% of patients who had no symptoms, while in 75% of the examinees, there were some disturbances, such as pain and dyspnea. In the study of Abraham et al, where the highest number of Larrey hernia cases was analyzed, 50% of the examinees were asymptomatic at presentation. The most common

contents of hernia were: stomach, transverse colon, omentum and spleen. The conditions for the appearance of clinical disturbances are the increased intraabdominal pressure, pregnancy, obesity, chronic constipation, chronic obstructive lung disease, bronchial asthma etc. [2, 10]. The clinical manifestation of Larrey hernia can also be developed as an acute condition in 25% of the cases. It occurs due to incarceration, i.e. volvulus of the abdominal cavity organs into the chest (stomach, transversal colon, omentum, small intestine etc.), with a gangrene formed and with perforation [6, 10]. The most common content of the anterolateral hernias are the omentum and the transversal colon, which was the case of our patient [11].

The diagnosis is set by a plain chest X-ray. However, the golden standard for diagnosing Larrey hernia is contrast computed tomography. In the cases where it is necessary to differentiate the unclear pictures of mediastinal or parasternal masses, it is also possible to apply the magnetic resonance imaging of the chest and abdomen [12]. The treatment of Larrey hernias, asymptomatic and symptomatic, is essentially surgical, performed in a timely fashion to prevent complications, such as incarceration, obstruction, strangulation, or volvulus with gangrene of the bowel. There are two possible approaches: transabdominal and transthoracic. In the series of 298 patients, already mentioned in Horton's study, 49% of the patients were treated trough thoracotomy, 30% through laparotomy, 17% laparoscopically and 0.7% thoracoscopically. The transthoracic approach has an advantage in the expressed adhesions of the hernia and the hernia sac, with pericardial pleural and other mediastinal structures. It also refers to the patients who had a previous abdominal operation. The transabdominal approach presents an advantage in the cases where it is necessary to explore the opposite side of the diaphragm, due to the suspicion of the existence of Morgagni, or Morgagni-Larrey hernia. Then, in order to explore the remaining part of the abdominal cavity, owing to the suspicion of other associated diseases, particularly in the cases of acute conditions with strangulation of the abdominal cavity organs [12, 13]. A combined approach should also be mentioned, which implies that the operation began with one approach (transabdominal or transthoracic), and then continued with another, in the conditions of non-reducible hernia, gangrene with perforation of the hollow viscus, etc. Besides the so-called "open approach", it is possible to make a minimally invasive, i.e. laparoscopic or thoracoscopic approach. The well-known advantages of the minimal invasive treatment, including the faster postoperative recovery, as well as the shorter hospitalization period and minimal scarring, urged an increased number of surgeons to treat the patients in this manner in the last several years, [1, 14]. The robotic surgery, whether transabdominal or

transthoracic, represents another technological progress with well-recognized advantages: ergonomics, preciseness of instruments, as well as easy operation in narrow spaces [15, 16]. With regard to the treatment with a small diameter hernia opening (less than 16 cm^2), it is possible to perform a primary suture, while in larger defects (larger than 20–30 cm^2), the plastics of the diaphragm opening is induced with the help of various kinds of meshes, to avoid tension [14]. The data from the literature indicate that polypropylene meshes are mainly applied, but the possibility of using other types of meshes has not been excluded [17].

Larrey hernia represents an extremely rare kind of the anterior diaphragm hernias, which can symptomatically manifest in older people over 65 years of age. This kind of hernia should be taken into account in older patients suffering from long-term respiratory problems, palpitations, fatigue, difficulties in discharging, swollen abdomen and occasional pain. The plain X-ray of chest and computerized tomography represents choices of diagnostic procedures that could discover the existence of the anterior left diaphragm hernia with high precision. The treatment of asymptomatic and symptomatic Larrey hernias is a surgical intervention.

All described procedures are in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Written consent to publish all shown material was obtained from the patient.

Conflict of interest: None declared.

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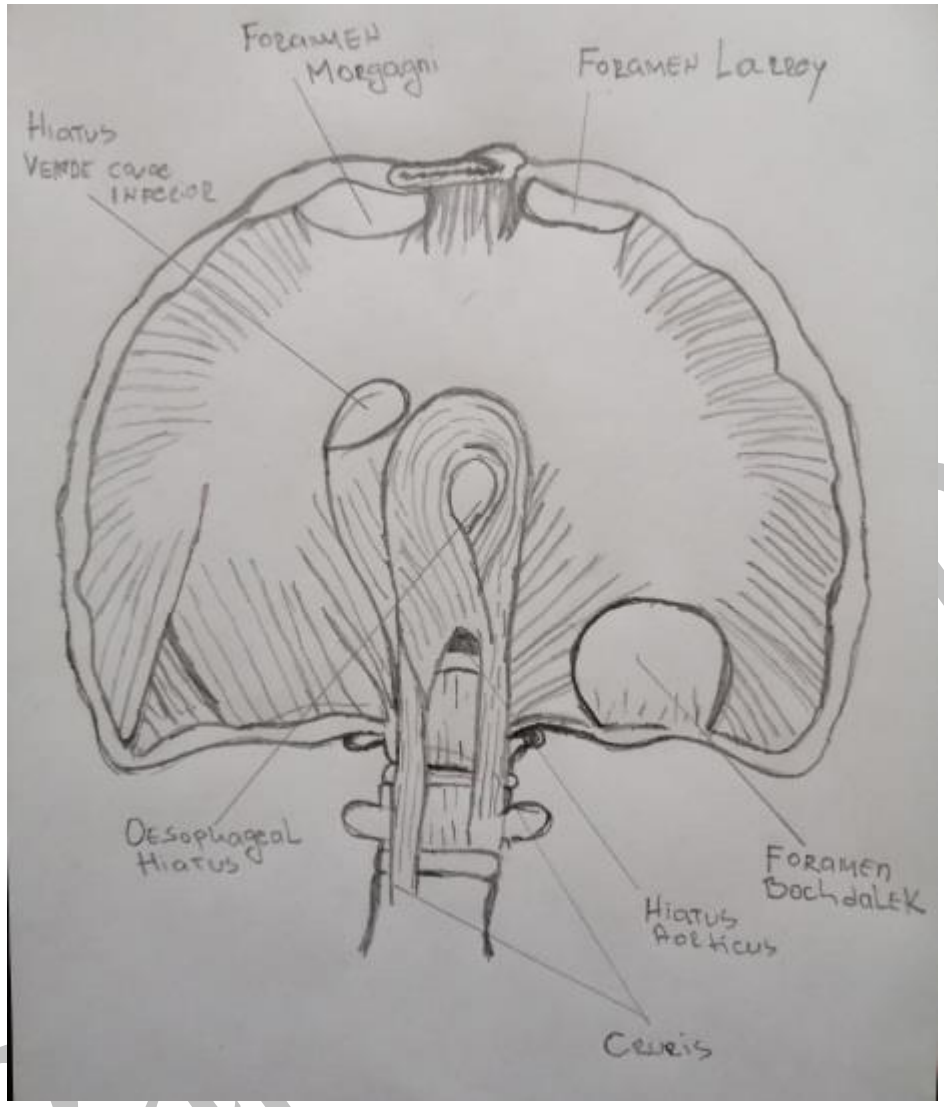

Figure 1. Anatomical locations of the common types of diaphragmatic hernia

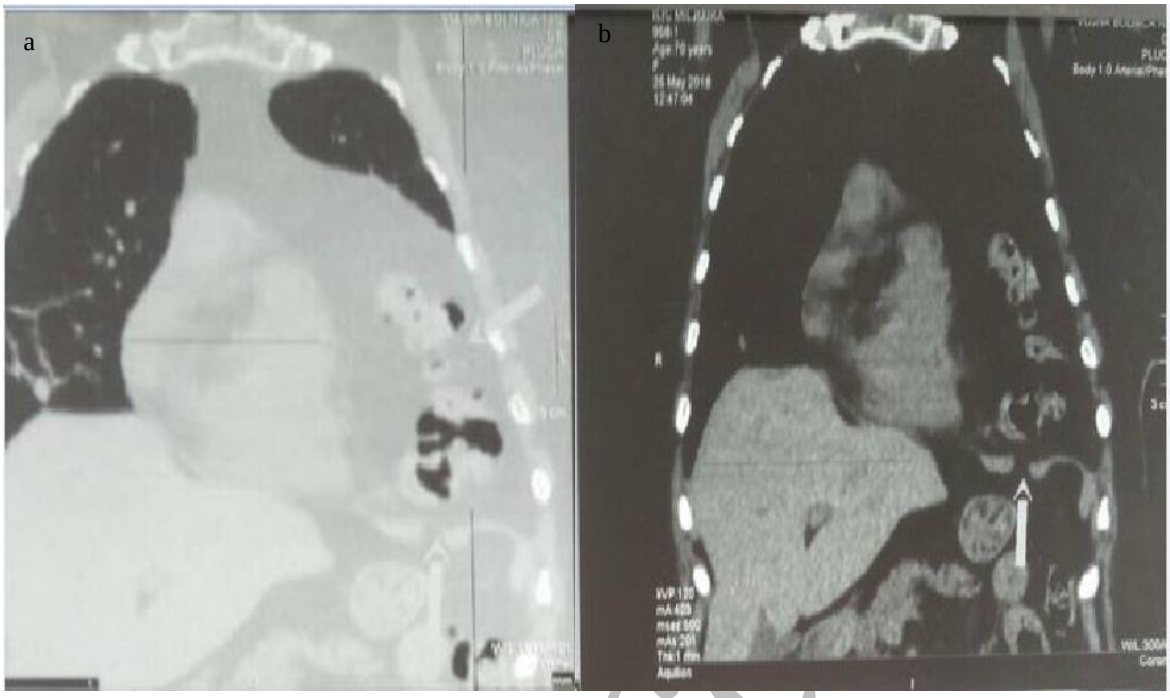

Figure 2. a) Preoperative sagittal CT scan of the chest and abdomen with Larrey left side parasternal congenital diaphragmatic herniation of abdominal contents into the thoracic cavity; b) preoperative sagittal CT scan with arrow showing anterior Larrey defect and anterior hernia

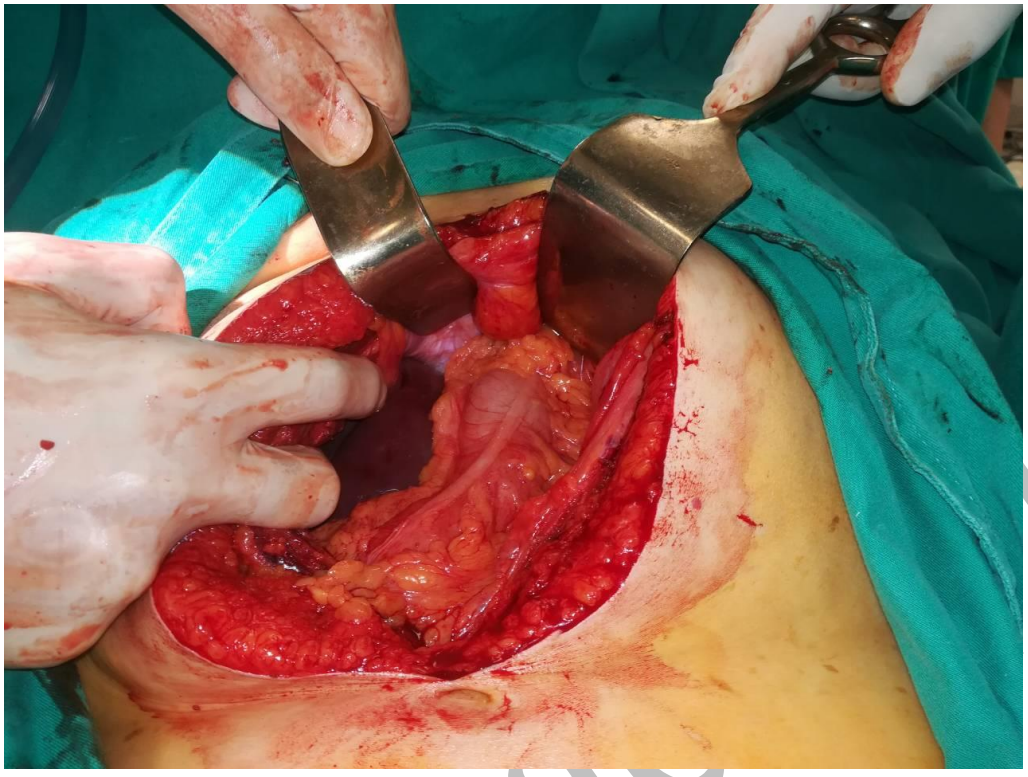

Figure 3. Intraoperative photograph showing diaphragmatic herniation of transverse colon and omentum trough the hernial defect into the thorax

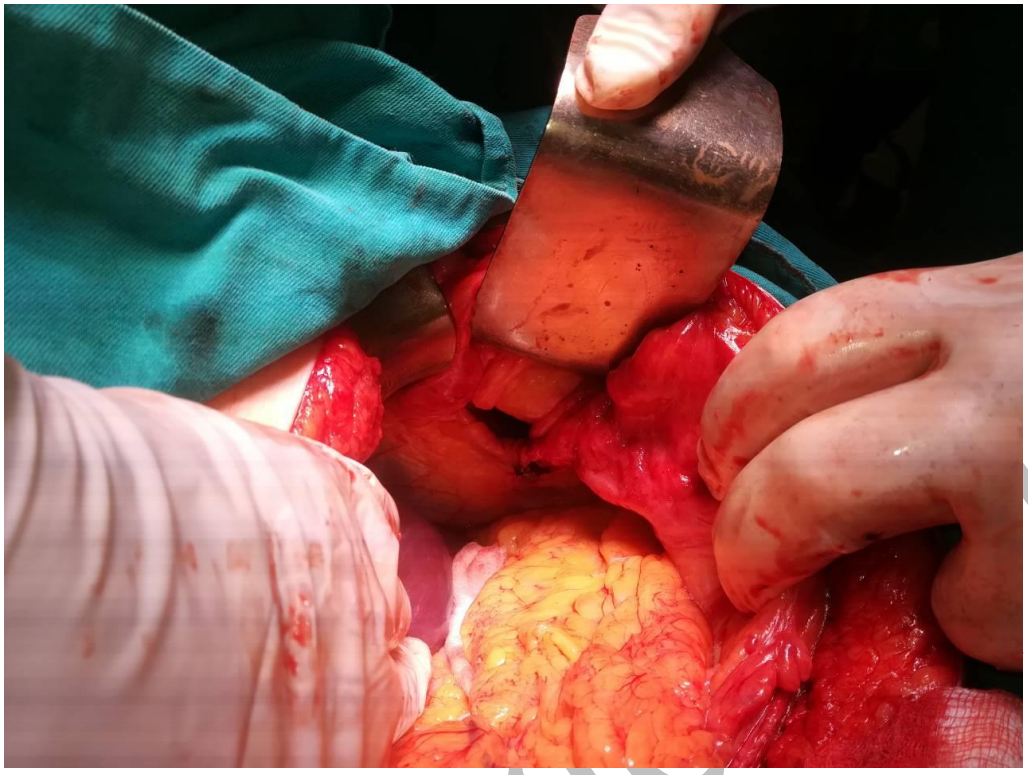

Figure 4. Intraoperative photograph showing the hernial defect on the left side of the retrosternal part of the diaphragm

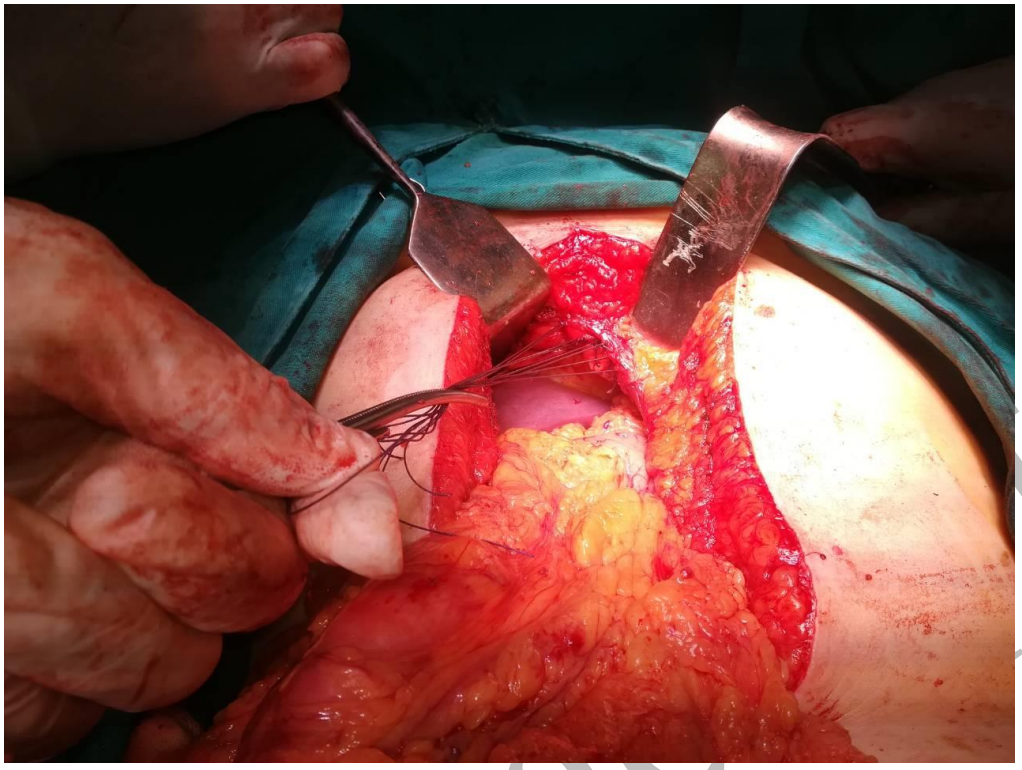

Figure 5. Primary closure of the retrosternal diaphragmatic defect using multiple interrupted sutures

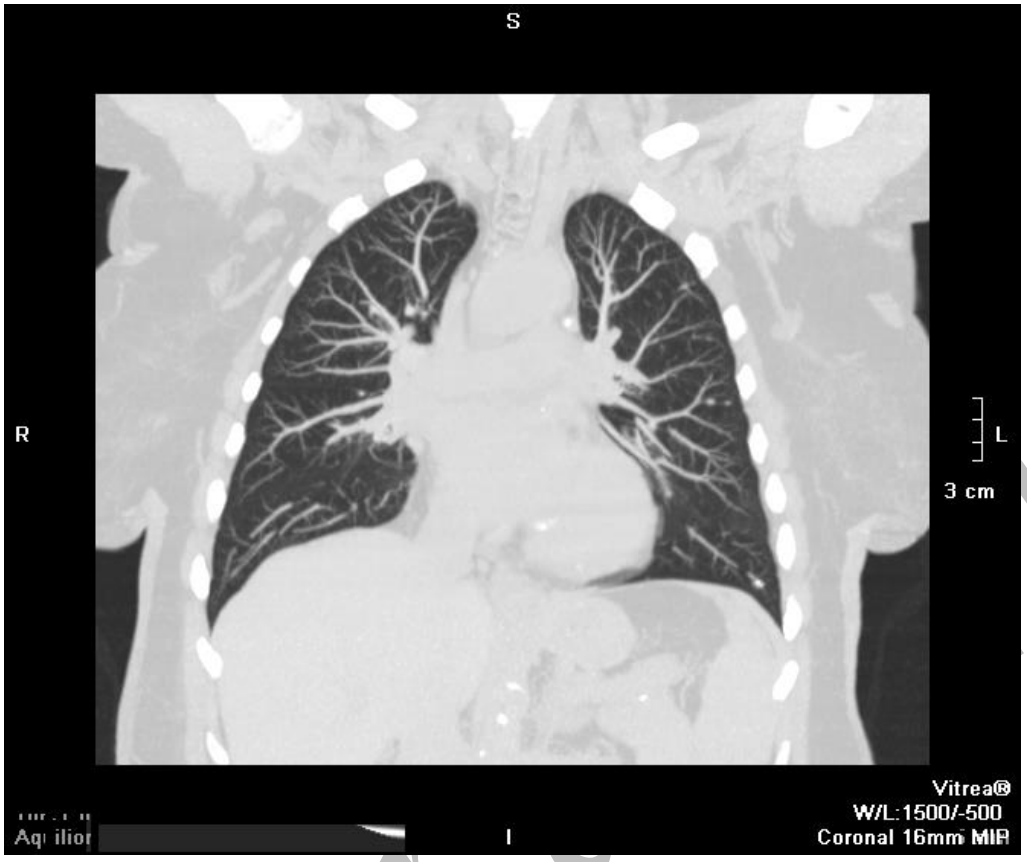

Figure 6. Six months after the operation control computed tomography scan was normal

