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Morgagni`S Hernia Presented with Respiratory Distress and Lead to Death: A Case Report and Literature Review

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Authors' contributions

This work was carried out in collaboration among all authors. Authors KS and AEB designed the study, performed the statistical analysis, wrote the protocol and the first draft of the manuscript. Authors KS and KEH managed the analyses of the study and managed the literature researches. All authors read and approved the final manuscript.

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Case Report

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ABSTRACT

Anterolateral or retrosternal Morgagni hernias are the rarest form of diaphragmatic hernias. They represent 2.5% of all diaphragmatic hernias. Their incidence is between 1% and 6%. They are congenital or traumatic origin. They are more frequent on the right side (70% to 90% of the cases) than on the left or midline and are bilateral in 7% of the cases. These hernias are most often asymptomatic, discovered incidentally during an imaging test. The diagnosis of Morgagni or Larrey's hernia is made on chest X-ray and confirmed by thoracoabdominal CT, or by magnetic resonance imaging (MRI). Complications, including strangulation of the colon or stomach herniated by constriction, are rare in adults as in children. The treatment of Morgagni diaphragmatic hernias in adults is surgical. The abdominal approach is the most common and laparoscopy is the

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technique of choice. Resection of the hernial sac and closure of the defect with mesh for reinforcement is accepted by most authors. We report the case of a patient who died in the service of general surgery department following a Morgagni hernia complicated by the cardiopulmonary collapse.

Keywords: Diaphragm; hernia; respiratory distress; Morgagni hernia.

1. INTRODUCTION

Anterolateral diaphragmatic hernias are rare. About 91% of retrosternal or anterolateral hernias are right-sided, 5% are left-sided and the remaining 4% are bilateral [1–3]. Morgagni's hernias are anterolateral on the right side. Their incidence is between 1% and 6%. They represent 2.5% of all diaphragmatic hernias [1,4,5]. The clinical presentation is extremely variable, most of them are asymptomatic or discovered incidentally by imaging assessment but some cases of life-threatening emergencies have been reported [2]. Complications, including strangulation of the organ herniated, are rare in adults as in children [2,6]. We report the case of a patient who died in the service of emergencies of general surgery of Ibn Rochd UHC following a Morgagni hernia complicated by cardiopulmonary collapse.

2. CASE REPORT

A 60-year-old man, without traumatism history, admitted in the emergency of the general surgery department of Ibn Rochd University Hospital Center for occlusive syndrome with vomiting over 24 hours associated with chest pain with dyspnoea, without hematemesis, no fever, with deterioration of overall health state. The physical examination found a patient agitated, with Glasgow coma score was at 13/15, with circulatory failure and respiratory distress, with 90/50 mmHg of blood pressure, 110 bpm of pulse, respiratory rate of 22 c / min, T = 36°C, restlessness, dyspnea, cold sweats. Auscultation found a well-audible cardiac sounds, abolition of the breath sounds in the right lung. The abdominal examination noted generalized abdominal distension with dullness, hernial areas and lymph nodes examination were free, the perineal exam was normal. The rest of the examination was unremarkable (the patientwas initially admitted to the stabilization room for conditioning). After hemodynamic and respiratory stabilization, a thoracoabdominal CT scan was performed and showed an ascent of a few small intestinal loops accompanied by their mesentery in the right thoracic cavity, through a right anterolateral diaphragmatic defect of 54 mm (Fig. 1). These intestines were distended filledwith gas, responsible for an underlying pulmonary collapse and repression of the organs of the right mediastinum on the contralateral side (Fig. 2),

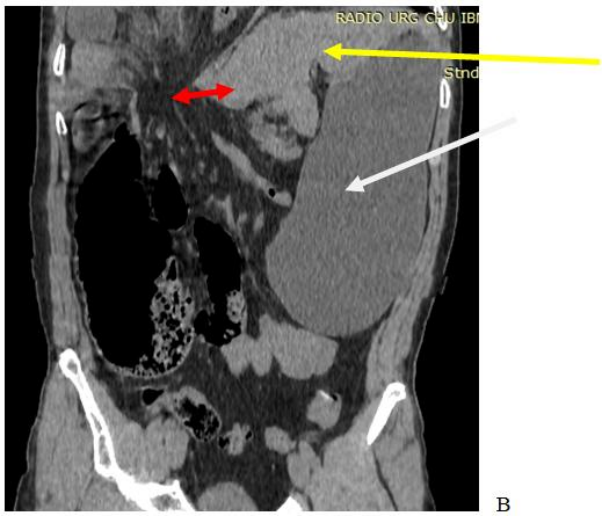

Fig. 1. CT scan, coronal plan: Stomach white arrow, liver yellow arrow, Defect of the diaphragmatic muscle with herniation of abdominal contents (◀▶)

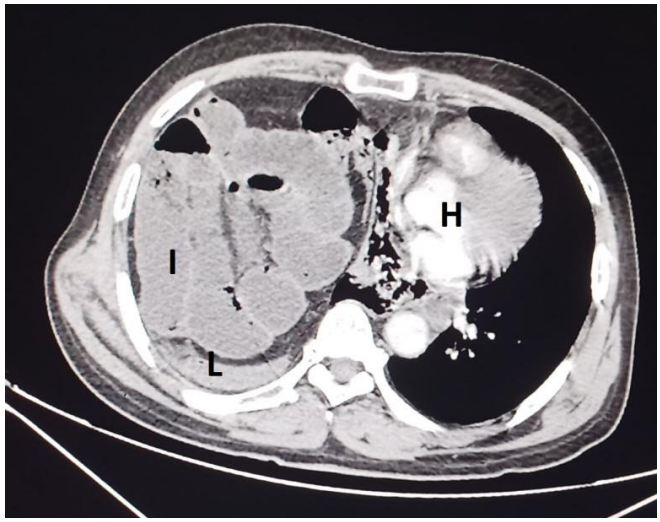

Fig. 2. Thoraco-abdominal CT scan axial plan; heart (H); right lung collapsed (L); intestine in the thoracic cavity (I)

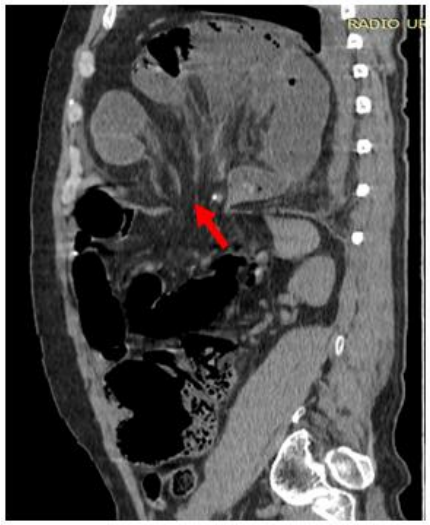

Fig. 3. Thoraco-abdominal CT: Sagittal plane. Note the anterolateral defect of the diaphragm muscle (⇧)

In the abdominal cavity, there was the liver compression and shifted to the left (Figs. 1 and 3). The patient was admitted in the service of emergency of the visceral surgery and was directly sent to the operative room, but he died on the table before the intervention was performed despite the resuscitation measures undertaken.

3. DISCUSSION

Congenital Diaphragmatic hernias are rare in adults. The incidence of Morgagni's hernia is 3% of all diaphragmatic hernias [7,8]. The formation of the diaphragm, which takesplace between the 4^{th} and 12^{th} weeks of gestation, is acomplex process. The diaph ragmbegins formation in the cervical region and proceeds in a caudal direction [9]. Themuscular component of the diaphragm is formed by myotomes that invade the mes enchyma in a dorsal to ventral orientation [10]. Thus the anterior aspect of the diaphragm is the last to form. As the diaphragm migrates caudally, two other processes are occurring. The sternum is fusing in a cephalad to caudal direction, and there is a rapid increase in

the abdominal contents. Errors in the coordination of this process lead to congenital defects or weakness in the diaphragm [2]. Appropriate primordial diaphragm development has been shown not to depend on lung tissue signals, and diaphragm malformation has been seen to be a primary defect in CDH, resulting from amal-formated, non-muscular mesenchymal diaphragm component before myogenesis [11]. Morgagni hernias often asymptomatic. In case of symptomatic hernia, they present non-specific symptoms such as, respiratory signs like cough, dyspnoea chest tightness and epigastric pain, nausea, constipation, which depend on the size of the diaphragmatic defect, volume and contents of the hernial sac [2,4,5,8]. The physical examination is poor and non-specific. The diagnosis is established on chest X-ray in 20 to 30% of cases, confirmed by thoracoabdominal CT scan. Magnetic resonance imaging (MRI)), could be used in selected cases for further assessment if the diagnosis is uncertain [3,12]. The thoracoabdominal CT scan shows a mediastinal mass which is a hyperclarity on the chest X-ray preoperatively. The CT scan of Morgagni's hernia is defined by the image of fatty and linear density of the vessels of greater omentum as well and the transverse colon filled with gas in the thoracic cavity. It rules out a cardiac or diaphragmatic mass and identifies the presence of the intestines in the thoracic cavity. The CT scan differentiates the Morgagni hernia with greater omentum content of a lipoma or pericardial fat [7,8,13]. Minneci reports a sensitivity of 83% during its study for the CT scan in the diagnosis of the Morgagni's hernias [7]. Complications including strangulation of the colon or herniated stomach, heart tamponade, pulmonary collapse, are rare in adults as in children [2,6]. For our case, the symptomatology started 24 hours before the patient's admission, with digestive signs; occlusive syndrome, nausea, vomiting and respiratory signs such as dyspnea, chest pain and deterioration of the overall health conditions. A CT scan that was performed revealed a diaphragmatic hernia with collapsed right lung and compression of the intrathoracic organs that were diverted to the contralateral side. The patient was admitted in an emergency with direct referral to the operating room. He had a cardiopulmonary arrest on the operating table before starting the intervention despite the resuscitation measures. This evolution with sudden death is unusual for Morgagni's hernia in adults for whom symptoms are mostly atypical or even asymptomatic while complications are rare [2,6]. Only two cases of cardiac tamponade with heart failure have been reported: one case was described in 2006 by Borowska A et al. in a 57-year-old man, the patient died of a cardiac arrest before the intervention could be attempted [9]. The second case in 2007 by Matsushita T et al. for a 57-year-old man with severe compression of the right ventricle and with clinical signs of tamponade; the hernia was large and contained the abdominal organs (large omentum, small intestine and transverse colon). The evolution was favourable after surgical treatment [12].

A case of sudden death in the emergency room following a pulmonary collapse was also published in 2009 by KanthiDeAlwis et al. In a 24-year-old woman with diaphragmatic hernia through Larrey's defect. The cause was confirmed by a thoracic CT and an autopsy performed after death[13].Tamponade and pulmonary collapse have been reported in newborns [10,11]. For our case, the diagnosis was established by imaging performed. A thoracic-abdominopelvic CT which was performed in an emergency while the patient was in the rescissutation room for monitoring and stabilization. Table 1 shows the diagnosis and the treatment of the Morgagni Hernia as presented by other authors in previews cases. [14].

The interest of our case lies in the importance of the diagnosis and therapeutic emergency of rare hernias of the diaphragm with life threatening which influence the success of treatment. The occurrence of pulmonary collapse in an adult by compression and consequently of respiratory distress is a very rare but possible what deserves to be notified and the clinician should think about complicated diaphragmatic hernia when there is an association of an occlusive syndrome and respiratory distress. The treatment of congenital diaphragmatic hernias of Morgagni in adults is always surgical. Laparoscopy is the technique of choice but laparotomy remains the most frequently used. Resection of the hernial sac and closure of the defect is accepted by most authors. The systematic placement of a parietal reinforcement prosthesis is still in discussion [11].

Table 1. Diagnostic and treatment of Morgagni Hernia: A literature review

Author	Age/sex	Diagnosis	Defect size	Contents	Treatment			Follow up in months
					Sac removal	Mesh placement	Defect closure	
Kuster	67/F	In	NR	Omentum, colon	N	N	RS	8
Rau	42/M	preop	6	omentum	Y	Y	-	-
Newman	57/F	In	NR	Omentum, colon	Y	Y	SS	NR
	22/F	In	NR	Liver	NR	N	SS	NR
	70/F	In	19X15	NR	NR	N	SS	NR
Smith	60/F	In	2X3.5	Omentum, colon	N	N	A	NR
J.M Sherigar	32/F	preop	6X5	Transverse colon	N	Y	SS	24
Huntington	75/F	In	4X9	Omentum	N	N	N	2
Orita	78/M	Preop	2X3.5	Omentum	N	N	SS	NR
Vinard	84/M	Preop	8	Stomach, colon, duodenum	N	N	RS	12
Fernandez	50/F	Preop	10X15	Colon, round ligament, omentum	Y	Y	RS	12
Del Castillo	50/F	Preop	12X15	Colon, omentum	N	Y	N	24
bortull	61/M	Preop	6X10	Bowel, omentum	N		A+D	3
Angrisani	60/F	Preop	10X15	Bowel, colon, duodenum	N	N	SS+D	48
Borowska	57/M	preop	NR	Great omentum and transverse colon	-	-	-	-
Matsushita	57/M	preop	NR	The large omentum, small intestine and transverse colon	NR	-	-	-
Kanthi	24/F	Preop	NR	Omentum, stomach, colon, spleen	-	-	-	Sudden death
Our case	60/M	preop	5.4 cm	Bowel, colon, omentum	-	-	-	Sudden death

(In incidentally, NR: Non reported, Preop: Preoperative, N: Non, Y: Yes, RS: Running sutures, SS: Separated stitches, A: Stapledagraphe, D: Drainage)

4. CONCLUSION

Anterior diaphragmatic hernias of Morgagni are rare. The treatment is always surgical, the abdominal approach is the most frequent and laparoscopy becomes the technique of choice. The diagnosis of complicated diaphragmatic hernia must be made when there is the association of respiratory signs and occlusive syndrome. In our case, the patient died before the starting of the surgical procedure despite of the resuscitation measures, but we preferred its publication for a learning purpose.

CONSENT

As per international standard, patient's consent has been collected and preserved by the authors.

ETHICAL APPROVAL

As per international standard, written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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