CASE REPORT

Laparoscopic repair of a Morgagni hernia with extra-abdominal transfascial sutures

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SUMMARY

Morgagni hernia is a congenital diaphragmatic hernia. It is rare, usually asymptomatic, and most of the times incidentally discovered during adulthood. A 77-year-old female patient was incidentally diagnosed with Morgagni hernia. Meanwhile, because of abdominal pain she resorted to the emergency department. A CT scan was performed. A laparoscopic repair with extra-abdominal transfascial sutures was conducted. At 3-month follow-up, the patient is asymptomatic. Surgical repair of Morgagni hernia is always indicated because of the risk of strangulation of hernia contents. Minimal invasive surgery is the gold standard, and laparoscopy is the preferred approach. Morgagni hernia does not have an anterior rim, which makes it technically difficult to close the defect. Extra-abdominal transfascial technique was used to repair the defect, eliminating the need for intracorporeal sutures. For small defects, simple repair with non-absorbable sutures using extra-abdominal transfascial technique is easy and efficient.

non-specific abdominal symptoms, using extra-abdominal transfascial suturing technique without the use of prosthesis.

CASE PRESENTATION

A 77-year-old female patient attended to a general surgery consultation following the incidental diagnosis of Morgagni hernia during an echocardiogram performed due to intense fatigue. Patient had no clinical history of trauma. Neither gastrointestinal nor respiratory signs and symptoms were noted until then. Abdominal CT scan was requested to hernia defect characterisation for posterior laparoscopic repair. Meanwhile, the patient resorted to the emergency department in the following weeks presenting with colic abdominal pain and nausea. Abdomen was tender but without peritoneal irritation. She was haemodynamically normal and without fever.

INVESTIGATIONS

There were no changes in blood tests. Chest X-ray was performed revealing Morgagni hernia with intrathoracic hydroaeric level, suggesting the thoracic presence of intestinal loop (figure 1). For that reason, emergency abdominal CT was carried out showing a left-sided Morgagni hernia with a 4×3 cm ring, contenting transverse colon and omentum, without signs of strangulation (figure 2). Since the patient became asymptomatic, she was discharge home.

TREATMENT

The following week an elective laparoscopic repair of the left-sided Morgagni hernia was performed. Patient was operated in a split leg position with inverted Trendelenburg, with the surgeon standing between the outstretched legs. Three port technique was used: 12 mm trocar in the supraumbilical midline for camera, two 5 mm working ports in the right and left upper quadrants at the midclavicular lines. Hernia contents were brought back into the abdomen, and the defect was closed with intermittent extra-abdominal transfascial 00 non-absorbable sutures with pledgets, suturing the posterior rim to the full thickness of the anterior abdominal wall (figure 3). To perform this technique a small incision (3 mm) was made in the anterior abdominal wall and a straight needle with 00 non-absorbable suture was passed into the abdomen including the posterior rim of the hernia. U figure with a pledget was made. To retrieve the straight needle in the

BACKGROUND

Morgagni hernia is a congenital diaphragmatic hernia. It is rare (2% of all diaphragmatic hernias), usually asymptomatic, and most of the times incidentally discovered during adulthood. It can occur on each side of the sternum, being the right side more often affected. Surgical treatment is always indicated despite the presence or absence of symptoms.^{1–3} Minimal invasive approach became the gold standard since 1992, following the first laparoscopic repair described by Kuster *et al.*^{1,4} Because a well-defined anterior rim is absent in a Morgagni hernia, it is difficult to close the defect.⁵ The authors report a laparoscopic simple repair of a left sided Morgagni hernia in an adult patient presenting

Figure 1 Chest X-ray revealing a Morgagni hernia. Liquid level is evident in the thorax. (A) Anteroposterior film. (B) Lateral film.

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Figure 2 CT scan is crucial for diagnosis and for hernia limits assessment. Left-sided Morgagni hernia with herniated colon and omentum is evident. (A) Axial plane. (B) Coronal plane.

correct direction, a 14-gauge needle was introduced through the same incision, and its lumen used to guide the straight needle out the abdomen (figure 3A). To include the entire posterior rim and close the defect, the same procedure was repeated four times (four 3 mm incisions). Knots were tied extracorporally and laid in the subcutaneous tissue. Hernia sac was not removed. No prosthesis was used since the repair was tension free (figure 3B). The surgery was uneventful.

OUTCOME AND FOLLOW-UP

Oral intake was started in the late afternoon. In postoperative day 1 the patient was free of symptoms and chest X-ray revealed the absence of hernia (figure 4). She was discharged home the day after surgery. There were no complications and at 3-month follow-up the patient was asymptomatic and happy with the final results (figure 5).

DISCUSSION

Hernia of Morgagni was first described in 1761 by Giovanni Batista Morgagni, hence its name. It is an anteromedial diaphragmatic defect, which can be on the right side (91%) or left side (5%) of the sternum (4% of the cases is bilateral) through a muscle-free space. The defect results from a fusion failure of the diaphragm with the costal arches.^{1 3 5-7} A left-sided defect is also called Larey hernia, leaving Morgagni hernia for right-sided defects. Since the anatomical origin is the same, they are both called anterior diaphragmatic hernias, Morgagni hernia.⁵ Patients are usually asymptomatic or present with vague and non-specific gastrointestinal, respiratory or cardiac symptoms. Because of that, diagnosis is often delayed and incidental in majority of cases.^{1 3 6} However, in rare cases diagnosis is made following bowel obstruction and strangulation.³ When present,

Figure 3 Laparoscopic repair with extra-abdominal transfascial sutures. (A) Four sutures were placed in the posterior rim of the hernia making a U figure with a pledjet. (B) All knots were tied closing the hernia defect without tension.

Figure 4 Postoperative chest film. No hernia is evident.

symptoms are related to the size and contents of hernia sac. The most frequently abdominal organs found in the hernia sac are the colon and omentum, and less frequently the small bowel, stomach and liver. Abdominal CT scan is of major importance in diagnosis confirmation, and in diaphragmatic hernia assessment allowing a good anatomical detail.^{1 3} In the case reported the diagnosis was also incidental. Although the patient was asymptomatic during the first consultation, she became symptomatic in the following weeks. She presented non-specific gastrointestinal symptoms (pain and nausea), which were probably related to the herniated transverse colon and omentum.

Even if asymptomatic, surgical repair of a Morgagni hernia is always indicated because of the risk of strangulation of hernia contents.^{1 2 6} Although uncommon, this complication can be life threatening.³ Thoracic and abdominal approaches have been described for hernia repair, but there seems to be no consensus on the best technique.⁶ Thoracotomy, laparotomy, thoracoscopy or laparoscopy are all valid options. Nowadays, minimal invasive technique is the gold standard, following the first laparoscopic repair reported by Kuster *et al* in 1992.^{1 3 4 8} Li *et al* present laparoscopy as a safe and reliable way to repair a non-complicated Morgagni hernia.¹ A comparative study between trans-thoracic and transabdominal approaches conducted by Aydin *et al* concluded that both techniques had similar morbidity and mortality rates, even though the authors propose the transabdominal approach assuming it is less invasive for the patient.² Sherigar *et al* from India concluded that laparoscopy gives a good access to the diaphragm, has good aesthetic results, no wound complications, decreased postoperative pain and faster recovery.³ In the case presented, laparoscopy was also chosen due to the great experience of the surgical team in laparoscopic surgery (colorectal, hepatobiliary, abdominal wall hernias).

Simple repair with non-absorbable sutures or the use of prosthesis are both valid options reported in worldwide literature.^{1 3} Small defects can be easily repaired with an intermittent or continuous suture, and bigger defects (>20–30 cm²) can be treated with a mesh. Combination of both is also possible.^{3 5 8} Whichever technique is used, the main objective is to achieve a tension-free repair.^{3 5} Because of its location Morgagni hernia does not have an anterior rim, which makes it technically difficult to close the defect.⁵ In that setting two different

Figure 5 Final aspect at 3 months of follow-up. The patient is asymptomatic and aesthetic results are very good.

solutions have been proposed, namely: intracorporeal suture of the posterior rim to the anterior abdominal wall muscles, or extra-abdominal suture of the posterior rim to the full thickness of the anterior abdominal wall.^{4,5} The last technique has no intracorporeal knots, which adds simplicity to the repair.⁵ Since the defect treated by the authors was 3 cm wide with 12 cm², tension-free repair was possible with intermittent sutures. Extra-abdominal transfascial technique was used to repair the defect, eliminating the need for intracorporeal sutures, which would make the procedure harder to perform. Because the knots were tied in the subcutaneous tissue, aesthetic results were very good (figure 5). To make the procedure simpler, a suture passer or a trocar site closure device can be used as describe by Yamamoto *et al.*⁵

Removing the hernia sac is not unanimous. In more than half the reported cases, the sac was left in place. There are no data available supporting better results after hernia sac excision. In fact, removing it can result in pneumothorax, pneumopericardium and massive pneumomediastinum with circulatory and respiratory complications.^{1,3} For this reason, we did not remove the hernia sac and no complications appeared to arise from that decision.

Learning points

- Morgagni hernia is rare and most of the times asymptomatic, which causes delay in diagnosis and treatment.
- A tension-free repair is always indicated to avoid life-threatening complications.
- Laparoscopy seems to be the preferred approach since it allows an easy access to the diaphragm and is less invasive for the patient.
- Hernia sac removal can cause circulatory and respiratory complications.
- For small defects, a simple repair with non-absorbable sutures using an extra-abdominal transfascial technique is easy and efficient.

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