

# Hernia of Foramen of Morgagni in Adult: Case Report of Laparoscopic Repair

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## ABSTRACT

The videolaparoscopic repair of a diaphragmatic hernia of Morgagni by external knot tying technique is described. A 69-year-old woman with subocclusive symptoms by intrathoracic migration of abdominal viscera had an immediate and complete postoperative recovery. The hernial sac was not excised. A four-year follow-up shows no hernia recurrence. This case indicated that the laparoscopic approach can be considered a suitable and safe procedure for treatment of Morgagni's hernia.

**Key Words:** Laparoscopy, Hernia, Morgagni, Diaphragmatic.

## INTRODUCTION

Morgagni foramen is a para-retrosternal defect resulting from an incomplete fusion of the septum transversum and sternum with the anterior ribs. Hernias of this foramen are rare.<sup>1,2</sup> Surgical treatment consists of direct closure of the diaphragmatic defect, suturing by transabdominal or transthoracic access. We report a patient with hernia of Morgagni who underwent a laparoscopic reduction and diaphragmatic defect closure.

## CASE REPORT

### Case History

A formerly healthy, 69-year-old woman was seen at our department in February 1995 because of epigastric pain and subocclusive symptoms for nine months. Barium enema showed a diaphragmatic herniation. A chest x-ray displayed a shadow in the lower anterior mediastinum. A computed tomography showed a gross diaphragmatic anterior hernia with partial right and transverse colon migration (**Figure 1**). The diagnosis of hernia of Morgagni was made, and the patient was considered for repair of the diaphragmatic defect by the laparoscopic approach.

### Laparoscopic Procedure

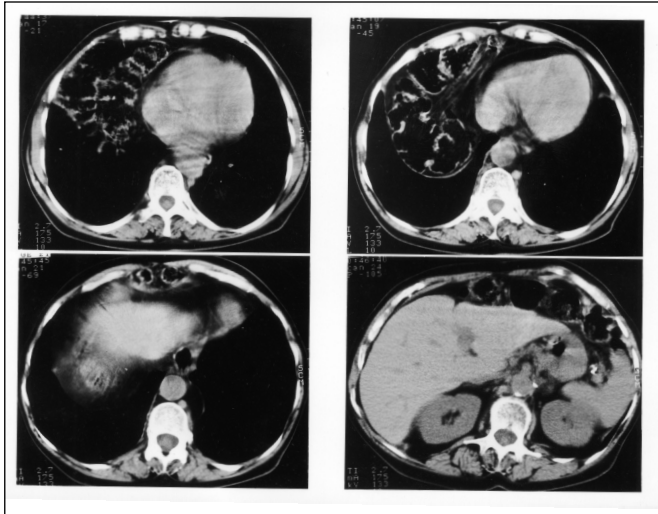
The patient was placed in a supine position and at 45° anti-Trendelenburg. Close CO<sub>2</sub> pneumoperitoneum (12 mm Hg) was performed with a Veress needle. A 10-mm trocar was inserted through the umbilicus for the videolaparoscope. The diagnosis of hernia of Morgagni was easily performed. Two additional 10-mm trocars were placed in the left and right flanks. The herniated bowel was gently pulled down with grasping forceps and placed entirely into the abdominal cavity (**Figures 2, 3 and 4**). The defect was ovoid and was closed with interrupted polyester stitches (Ethibond-Ethicon) using the external knot-tying technique. An aspirate drainage was left in the diaphragmatic defect (**Figure 5**). Another drainage was left in the abdominal cavity. Trocars were retrieved under direct endoscopic vision, and the fascial incision was closed with glycolic acid (Vicryl-Ethicon). A chest x-ray showed the successful laparoscopic closure of the diaphragmatic defect (**Figure 6**). Recovery was unevent-

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**Figure 1.** CT scan reveals the bowel herniated in the lower right anterior mediastinum.

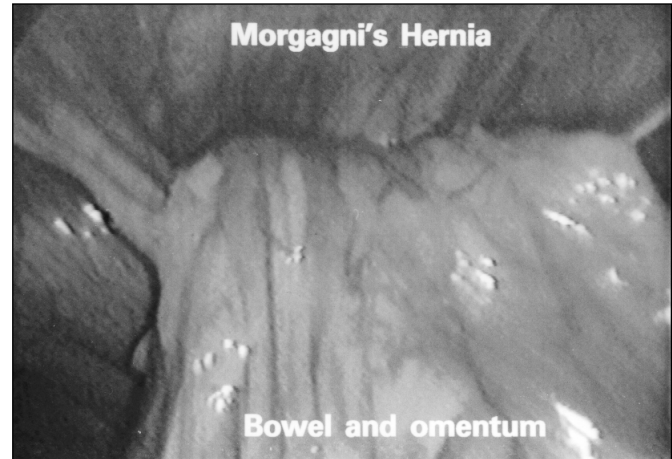
ful, and the patient was discharged four days after surgery.

#### Follow Up

After 12, 24, 36 and 48 months follow-up, the patient was symptom-free, without recurrence of her Morgagni's hernia (**Figure 7**).

#### DISCUSSION

Giovanni-Battista Morgagni first described this type of hernia in 1761.<sup>2</sup> The origin of the retroxyphoid diaphragmatic defect is mainly congenital, rarely traumatic.<sup>3,4</sup> Being overweight and having scoliosis are often associated with this type of hernia.<sup>5</sup> Morgagni's hernia represents approximately 1-3% of surgically treated diaphragmatic hernias.<sup>1,5</sup> The defect is usually small and contains a sac with herniated omentum, transverse colon and, more rarely, liver, small bowel and stomach.<sup>6-8</sup> Many hernias are frequently found in adults. They are often asymptomatic and diagnosed incidentally by a chest X-ray.<sup>6,7,9</sup> They may also produce epigastric and/or retrosternal discomfort or bloating. Acute symptoms are rare and are almost always due to large bowel obstruction.<sup>8</sup> In infants, respiratory distress and cyanosis are more frequent symptoms.<sup>10</sup> Plain roentgenograms usually differentiate the hernia of foramen of Morgagni from other masses (lung or mediastinal tumors, pericardial fat



**Figure 2.** Laparoscopic view of hernia of the foramen of Morgagni containing colon and omentum.

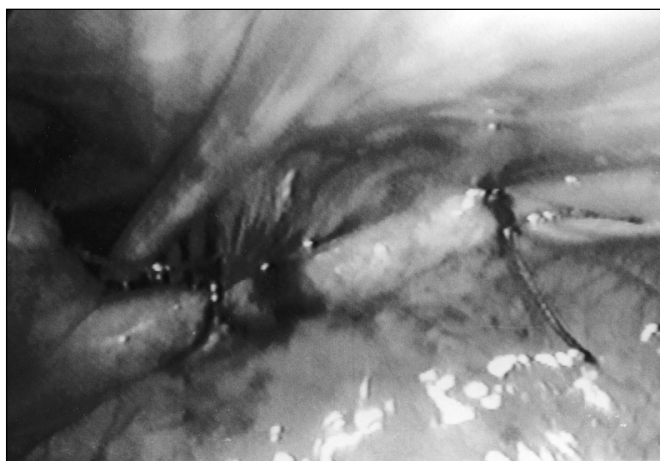


**Figure 3.** Colon and omentum were gently pulled out from hernial defect.

pad, pleural, pericardial, mediastinal or diaphragmatic cyst) or pathologies (atelectasis, pneumonia). Barium enema, computed tomography and magnetic resonance may be required to confirm the diagnosis.<sup>6,8,11,12</sup> Although complications are rare, because of potential strangulation, hernia of Morgagni foramen should be repaired. The standard surgical procedure requires laparotomy or a thoracotomy. After viscera reduction into the abdominal cavity, the sac can or cannot be excised. The defect is closed with nonabsorbable

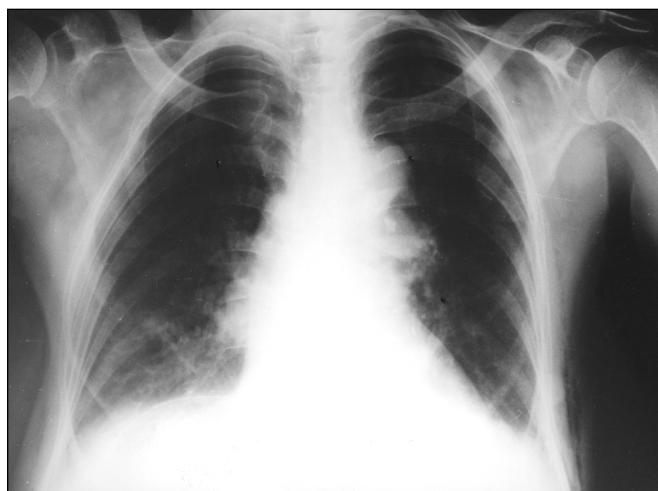


**Figure 4.** Videolaparoscopic view of hernial defect after reduction of its content. Only falciform ligament is in.

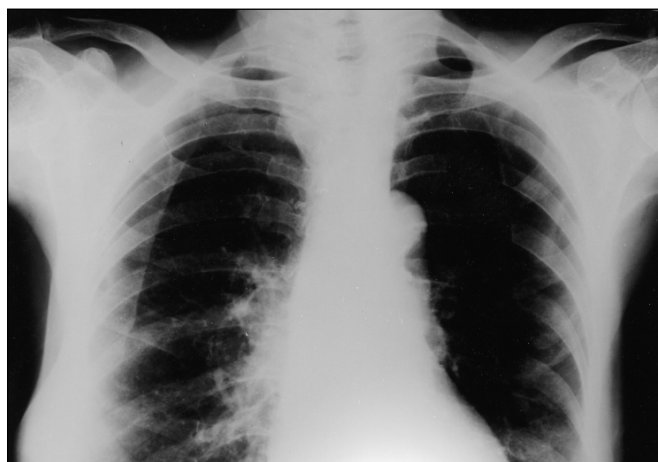


**Figure 5.** An aspirate drainage was left in the sac before closing last stitches.

suture.<sup>6</sup> Both the laparotomic and thoracotomic approach require a long postoperative recovery period, with significant mortality and a prolonged rehabilitation period. Conversely, the laparoscopic approach for treatment of Morgagni hernia results in an immediate return to normal diet and activities. Literature review of laparoscopically treated Morgagni's hernia is reported in **Table 1**. Regarding the technique of defect closure, in a previous report Kuster has underlined that the hernial sac does not need to be removed.<sup>6</sup> This removal, in fact, may result in massive pneumomediastinum with poten-



**Figure 6.** Chest x-ray done after operation, showing no evidence of Morgagni's hernia.



**Figure 7.** Chest x-ray done four years after the laparoscopic repair, showing no evidence of hernial recurrence.

tial respiratory and circulatory complications. In Kuster's technique, the diaphragmatic defect was closed by a nonabsorbable monofilament with continuous suture joining the subcostal and retrosternal peritoneum to the full thickness of the diaphragmatic edge. Then the suture was percutaneously brought back anteriorly to the abdomen. A 2-cm skin incision was made, through which the two ends of the suture were tied in subcutaneous tissue.<sup>6</sup> More recently, Fernandez-Cebrian has

**Table 1.**

Laparoscopic Repair in Cases of Morgagni Hernias: Literature Review.

Author (ref)	Age/Sex	Diagnosis	defect size (cm)	content	sac removal	mesh placement	defect closure	follow-up (months)
Kuster <sup>6</sup>	67/F	in	NR	omentum, colon	N	N	RS	8
Rau <sup>11</sup>	42/M	preop	6	omentum	Y	Y	-	-
Newman <sup>7</sup>	57/F	in	NR	omentum, colon	Y	Y	SS	NR
	22/F	in	NR	liver	NR	N	SS	NR
	70/F	in	10 x 15	NR	NR	N	SS	NR
Smith <sup>9</sup>	60/F	in	2 x 3.5	omentum, colon	N	N	A	NR
Huntington <sup>13</sup>	75/F	in	4 x 9	omentum	N	Y	N	2
Orita <sup>14</sup>	78/M	preop	2 x 3.5	omentum	N	N	SS	NR
Vinard <sup>8</sup>	84/M	preop	8	stomach, colon, duodenum	N	N	RS	12
Fernandez <sup>15</sup>	50/F	preop	10-15	colon, round ligament, omentum	Y	N	RS	12
Del Castillo <sup>18</sup>	50/F	preop	12 x 15	colon, omentum	N	Y	N	24
Bortul <sup>12</sup>	61/M	preop	6 x 10	bowel, omentum	N	Y	A+D	3
	69/F	preop	10 x 15	bowel, colon, duodenum	N	N	SS+D	48

In = incidental; preop = preoperative; NR = not reported; Y = yes; N = non; RS = running suture; SS = separate stitches; A = stapled agraphes; D = drainage.

described a patient in whom the hernial sac was removed without complications.<sup>13</sup> Also, in this case, the defect was repaired with a continuous suture, but with intra-abdominal knotting. In our own experience, the sac was not removed to avoid the unacceptable risk of damage to the pericardium and/or the mediastinic or diaphragmatic pleura. Cases of fatal pneumopericardium have been reported after dissection of the peritoneal sac in children.<sup>14</sup> We preferred to close the defect with interrupted nonabsorbable suture using an extra-abdominal knot-tying technique. In fact, in our own experience and in the literature, it has been noted that separate stitches are preferable to avoid tissue tearing. Moreover, extracorporeal knotting has been shown to be easier to perform and is less time consuming than intracorporeal

techniques.<sup>15</sup> The drainage is generally left in place of an empty cavity, according to traditional principles of general surgery. Probably, it is not useful, but, since we did not have any previous experience with this kind of operation, a prudential approach was preferred. Rau in 1994,<sup>11</sup> Huntington in 1996,<sup>16</sup> Orita<sup>17</sup> in 1997, and Del Castillo<sup>18</sup> in 1998 reported a successfully repaired laparoscopic Morgagni hernia by stapling a mesh prosthesis. Rau did resect a peritoneal sac, and the prosthesis was covered with a flap of falciform ligament and with ligament teres.<sup>11</sup> Huntington did not resect the sac, and the prosthesis was covered by a peritoneal reflection obtained by a peripheral incision for several centimeters around the defect.<sup>16</sup> In the Orita experience also, the sac was not removed, and the operation was con-

ducted by a gas-less approach to facilitate the suturing technique.<sup>17</sup> Vinard, in 1997, presented a case that allowed satisfactory surgical repair by simple closure of the hernial orifice with a running suture.<sup>8</sup> Because of the lack of experience reported in the literature, it is not possible to define whether or not mesh placement is better than a suture for closing the Morgagni's hernia. It is, however, noteworthy that the classic repair by the laparotomic approach is the direct suture of the linear hernial orifice.<sup>19</sup> A large cavity is observed only with pneumoperitoneum. Moreover, laparoscopic repair can be successfully associated with other procedures, such as cholecystectomy.<sup>7,9,13</sup> Follow-up of operated patients was reported only by some authors and only in one case for 24 months. It is not known whether or not patients were recurrence free after longer follow-up. In the patient herein reported, follow-up was done for more than four years and showed the absence of symptoms or recurrence.

**CONCLUSIONS**

Independently from the laparoscopic surgical technique used, literature data and our own experience indicate that the therapeutic and rehabilitative advantages that are well proved for cholecystectomy and other videolaparoscopic procedures with respect to a laparotomic approach can be extended to patients with hernia of foramen of Morgagni as well.

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