Case Series

Characteristics and outcomes of laparoscopic surgery in patients with large hiatal hernia. A single center study

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A B S T R A C T

INTRODUCTION: Giant hiatal hernia is characterized by the presence of more than 1/3 of the stomach in the chest, through the diaphragmatic hiatus, with or without other intra-abdominal organs. It is a rare pathology, representing the 5–10% of all hiatal hernias. The advent of laparoscopic surgery led to new surgical techniques, which include the simple reduction with the excision of the hernial sac and the execution of a posterior hiataloplasty, with or without mesh, and the execution of a Collis-Nissen gastroplasty in case of short esophagus.

PRESENTATION OF CASES: We followed 24 cases of giant hiatal hernia with more than 1/3 stomach located in the chest, analyzing the results reached by the minimi invasive procedure, and the long-term pathophysiologic results of the disease.

DISCUSSION: Laparoscopic hiatal hernia repair results in less postoperative pain compared with the open approach. The smaller incisions of minimally-invasive surgery are less likely to be complicated by incisional hernias and wound infection. Postoperative respiratory complications are reduced.

CONCLUSION: Results from multiple studies are similar, with shorter hospital stay and less morbidity resulting from the minimally invasive approach.

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1. Introduction

The process Guideline of surgical case series is used for our paper. Giant hiatal hernia is characterized by the presence of more than 1/3 of the stomach in the chest [1,2]. It is a rare pathology, representing the 5–10% of all hiatal hernias [4,5]. These giant hernias are associated with a wide spectrum of symptoms [3,4]. Typical symptoms are chest pain, vomit and post-prandial dysphagia, as result of the mechanic effect of stomach translocation into the thorax. Giant hiatal hernia are associated to severe complications such as torsion, perforation and massive bleeding [3–5]. Such complications register a 26% death ratio in the patients who do not undergo surgery [6].

In light of the above, it follows that the carriers of giant hiatal hernia should all undergo elective surgery treatment. The advent of laparoscopic surgery led to new surgical techniques, which include the simple reduction with the excision of the hernial sac and the execution of a posterior hiataloplasty [7,8] and the execution of a Nissen gastroplasty [9,10], or a Collis-Nissen gastroplasty in case of short esophagus.

In our study, we followed 24 cases of giant hiatal hernia, analyzing the results by the mini invasive procedure, and the long-term pathophysiologic results of the disease.

2. The process guideline of surgical case series is used for our paper [11]

2.1. Presentation of cases

From January 2007 to February 2017, 30 patients were diagnosed with giant hiatal hernia, of whom 24 were treated with
laparoscopic technique, while the other 6 underwent open surgical treatment with laparotomy.

Data were analyzed retrospectively; the routine pre-operative evaluation comprehended an accurate clinical exam, an oesophageal radiological examination after barium swallow, an upper gastrointestinal endoscopy, a thoracic CT-scan, an high resolution esophageal manometry and a 24h multichannel impedance pH monitoring.

Every patient was submitted a questionnaire about their symptoms and quality of life associated to the reflux disease (GERD-HRQoL and SF-36).

Patients underwent laparoscopic treatment with posterior hiatal plication and antireflux Nissen fundoplication. Peri- and post-operative complications have then been evaluated.

Clinical and radiological follow up was conducted at 3, 6 and 12 months intervals after treatment. GERD symptoms such as heartburn, revival, dysphagia and other signs of recurrence such as abdominal or chest pain, were evaluated with the GERD-HRQoL questionnaire. A gastroesophageal radiography after barium swallow was taken at 3 and 12 months follow-up. Endoscopic check was conducted 6 month after surgery. High resolution esophageal manometry was effectuated at 3 and 12 month follow up, together with 24h multichannel pH-impedance and bilirubin monitoring.

Most important part of surgery is the complete dissection of the mediastinal hernia sac; when this is achieved, the herniary content gradually returns to the abdomen.

The hiatus is then fixed by means of suture points. Right and left pillars are joined by two or more points, until the diameter of the hiatus is reduced to about 30 mm (Figs. 1 and 2).

As soon as the hiatus has been adequately tightened, we add a Nissen anti-reflux plastic.

The plastic is calibrated by intraoperative manometry without sectioning the short vessels.

The hospitalization was 5 days (range 4–10 days). The average follow-up for these 24 patients was 12 months. Symptomatic outcomes, according to the GERD-HRQoL test, were evaluated at 3, 6 and 12 months after surgery, with a statistically significant score decrease (from 37.4 to 3.2 [to 12 months], p < 0.005). During the follow-up we did not observe any hernia relapse at the contrastographic examination or any pathological findings from endoscopy. The high-resolution esophageal manometry at 6 and 12 months from surgery showed an average pressure value of new–HPZ (new cardial high pressure zone) of 23.4 ± 2.1 mmHg and 21.2 ± 1.6 mmHg, respectively, compared to preoperative data of 9.3 ± 2.1 mmHg (p < 0.05). 24-h pH-impedance and bilirubin multichannel monitoring did not show pathogenic acid and/or alkaline reflux.

3. Discussion

The giant hiatal hernia is characterized by the herniation of a substantial part of the stomach in the posterior mediastinum, and it is always symptomatic.

Standardized treatment of giant hernias is still controversial since it has a high rate of recurrence. Open vs. laparoscopic controlled randomized (RCT) trials related to the Nissen fundoplication have clearly showed better short-term results following laparoscopic procedures; instead surgical long-term outcomes are similar to those of open surgery. A liquid diet was given on the first post-operative day and, subsequently, a light diet, usually on the third day. The average cannalization time was 1.4 days. The average hospital stay was 5 days (range 4–10 days). The mininvasive approach offers an excellent view of the hiatal region, better than laparotomic approach and it is related to a lower morbidity and mortality rate, shorter hospitalization and good patient compliance. Technically, laparoscopy allows an easier identification of anatomical structures and the dissection is facilitated by pneumoperitoneum.

4. Conclusion

Laparoscopic approach is currently the standard technique for the correction of giant hiatal hernia and the complete dissection of the hernial sac from its intrathoracic site as well.

Interesting data were obtained using high resolution esophageal manometry, that showed changes in the esophageal peristalsis.

However, due to the exiguity of our sample and the lack of proper data in literature, findings interpretation is controversial and goes beyond the scope of our study but offers fascinating insights for future discussions, demonstrating how advancing diagnostic techniques allows an ever greater understanding of the physiopathology of the disease.

Conflicts of interest

None.

Funding

None.

Ethical approval

This kind of study is automatically exempt from requiring ethics approval in our Institution.
Consent

Written informed consent was obtained from all the patients for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Angela Romano: participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data; also participated substantially in the drafting and editing of the manuscript.

Giuseppe Esposito: participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data; also participated substantially in the drafting and editing of the manuscript.

Davide D’amore: participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

Marianna Petrillo: participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

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Francesco Maria Romano: participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

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Giuseppe Izzo: participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

Angelo Cosenza: participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

Francesco Torelli: participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

Antonio Volpicelli: participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

Natale Di Martino: participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data; also participated substantially in the drafting and editing of the manuscript.

Registration of research studies

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