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RECURRENT HIATAL HERNIAS. TO OPERATE OR NOT?

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The recurrence of a hiatal hernia after surgical treatment is the most serious and far from resolved problem in this area of surgery. The validity and effectiveness of surgical treatment of recurrent hiatal hernia of the diaphragm remains the subject of clinical research and scientific discussion. The main problems of such interventions are the difficulty of eliminating the anatomical or functional factors that underlie the failure of the primary operation. The stated provisions determine the need for further searches for a solution of this problem. In the period from 2015 to 2020, 61 patients with recurrent hernia of the gastrointestinal orifice of the diaphragm underwent surgical treatment. Indications for the operation were gastroesophageal reflux refractory to drug therapy or anatomical changes that carry the risk of developing life-threatening conditions. In 58 (95.1%) cases, surgery was performed laparoscopically, in 3 (4.9%) — through left-side thoracotomy. In 54 (88.5%) cases, complete restoration of normal anatomy with closure of the hiatal opening with prosthetic material is performed. In 7 (11.5%) cases, when the esophagus was shortened, the fundoplication cuff was created in the chest cavity, and the hiatal opening was performed only with its own tissues. Complications occurred in 11 (18.0%) cases (7 – pneumothorax, 2 – bleeding, 2 – perforation of a hollow organ). Long-term results (12-48 months) were evaluated in 57 (93.4% of operated) people. Repeated recurrence of hiatal hernia of the diaphragm was detected in 6 (10.5%) cases. In 44 (77.2%) cases, the natural anatomical position of the abdominal organs was documented. In 7 (12.3%) patients, with a fundoplication cuff formed in the chest, its initial position was ascertained.

Keywords: recurrent hiatal hernias; surgical treatment; antireflux surgery.

РЕЦИДИВНЫЕ ГРЫЖИ ПИЩЕВОДНОГО ОТВЕРСТИЯ ДИАФРАГМЫ. ОПЕРИРОВАТЬ ИЛИ НЕТ?

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Повторное возникновение грыжи пищеводного отверстия диафрагмы после оперативного лечения является наиболее серьезной и далекой от решения проблемой данной области хирургии. Обоснованность и эффективность хирургического лечения рецидивных грыж пищеводного отверстия диафрагмы остается предметом клинических исследований и научной дискуссии. Основная проблема подобных вмешательств — это сложность устранения анатомических или функциональных факторов, лежащих в основе неудачи первичной операции. Изложенные положения определяют необходимость дальнейших поисков решения проблемы. В период с 2015 по 2020 г. хирургическое лечение проходил 61 пациент с рецидивной грыжей пищеводного отверстия диафрагмы. Показаниями к операции стали рефрактерный к медикаментозной терапии гастроэзофагеальный рефлюкс или анатомические изменения, несущие риск развития угрожающих жизни состояний. В 58 (95,1 %) случаях хирургическое вмешательство было осуществлено лапароскопически, в 3 (4,9 %) — через левостороннюю торакотомию. В 54 (88,5 %) случаях удалось выполнить полное восстановление нормальной анатомии с пластикой хиатального отверстия протезирующим материалом. В 7 (11,5 %) случаях при укорочении пищевода фундопликационная манжета создавалась в грудной полости, а пластика хиатального отверстия осуществлялась только собственными тканями. Осложнения имели место в 11 (18,0 %) случаях (7 — пневмоторакс, 2 — кровотечение, 2 — перфорация полого органа). Отдаленные результаты (12–48 мес.) оценены у 57 (93,4 % оперированных) человек. Повторный рецидив хиатальной грыжи диафрагмы

выявлен в 6 (10,5 %) случаях. В 44 (77,2 %) наблюдениях документировано естественное анатомическое положение органов брюшной полости. У 7 (12,3 %) пациентов, со сформированной в грудной клетке фундопликационной манжетой, констатировано ее первоначальное положение.

Ключевые слова: рецидивные грыжи пищеводного отверстия диафрагмы; хирургическое лечение; антирефлюксная хирургия.

INTRODUCTION

Hiatal hernias (hiatal hernias) are among the most common types of visceral anatomical disorders. The current indications for surgical treatment of this pathology are gastroesophageal reflux (with hiatal hernias of types I and III) not amenable to drug therapy or disorders of food or intestinal content transport (with hernias of types II–IV) [1, 9, 10, 12].

An unsolved problem in this area of practical medicine is the high frequency of repeated displacement of the abdominal organs into the chest. According to various prospective studies, disease recurrence is observed in 20%–40% of cases [1, 9, 10, 12].

The main causes of unsatisfactory results of surgical treatment of hiatal hernias are a large (over 5 cm) hiatal orifice, mechanical weakness of the muscular peduncles that form it, and shortening of the esophagus (which pulls the stomach, followed by other organs of the abdominal cavity, into the mediastinum) [1–4, 9, 10, 12].

To correct the anatomical prerequisites for the recurrence of hiatal hernia and increase the long-term effectiveness of surgical treatment of this pathology, an entire arsenal of techniques has been proposed: the use of prosthetic materials or the round ligament of the liver to correct the size of the hiatal opening, fixation of the stomach to the anterior abdominal wall (gastropexy), lengthening of the esophagus by excising the tube from the stomach, and several other methods. All of these techniques have their advantages, disadvantages, indications, and contraindications for use and, in general, reduce the potential for disease relapse. However, they do not exclude it completely, leaving the problem unsolved [1, 6, 9–12].

The feasibility of repeated surgical interventions for hiatal hernias remains a subject of discussion throughout this field of surgery. The main problem of revision operations is the difficulty of eliminating the anatomical and physiological factors underlying the repeated displacement of the abdominal organs into the chest. The technical complexity of such interventions is also important in that it determines a higher risk of serious complications, including life-threatening ones. All of these conditions ultimately determine the high incidence of unsatisfactory results of surgical treatment for recurrent hiatal hernias, reaching 70%–90% in some studies [2, 4, 5, 7, 8, 12].

The stated provisions determine the need for a further search for approaches to solving this problem.

The aim of the study was to evaluate the feasibility of surgical treatment of recurrent hiatal hernia.

MATERIALS AND METHOD

In the period from January 2015 to March 2020 in the clinic of the Department of Faculty Surgery of Pavlov First Saint Petersburg State Medical University, 69 patients with recurrent hiatal hernia were examined and treated. Most patients (65) underwent surgery earlier in other clinics in St. Petersburg and Russia. Four patients underwent primary surgery in the clinics of Pavlov First Saint Petersburg State Medical University. The time period from the first operation to the moment of detection of disease relapse varied from 6 months to 12 years.

The clinical manifestations of recurrent hiatal hernia are esophageal and extraesophageal symptoms of gastroesophageal reflux (heartburn, belching, bitter taste in the mouth, voice changes, chronic cough) or signs of impaired food transport (chest pain or epigastric pain worsening after eating, odynophagia, dysphagia).

The main instrumental method for diagnosing repeated displacement of the stomach into the mediastinum is radiography of the upper digestive tract with $BaSO_4$. Endoscopic examination was performed to assess changes in the mucous membrane of the esophagus and stomach. Gastroesophageal reflux was confirmed (excluded) based on 24-h esophageal pH-meter impedance. Assessment of the contractile activity of the organ was carried out using high-resolution esophagomanometry.

Patients with clinical symptoms of impairment, regardless of X-ray data, underwent spiral computed tomography with a water-soluble contrast agent to confirm (exclude) anatomical abnormalities that carry the risk of developing life-threatening conditions (acute obstruction, volvulus, and necrosis of the stomach displaced into the thoracic cavity or

other hollow organs). The criterion for such changes was the formation of a "gastric valve," – rotation of a part of an organ with impaired evacuation of the contents from one section to another, or the presence of loops of the small or large intestine in a hernial protrusion.

Indications for re-intervention were considered from the standpoint of the physiology and functional anatomy of the upper digestive tract: the presence of clinical manifestations of the disease refractory to drug therapy (gastroesophageal reflux), impaired food transport, or the risk of developing acute changes in the contents of hernial protrusion ("gastric valve," bowel loops).

RESULTS AND DISCUSSION

In 8 (11.6%) patients with recurrent hiatal hernias amenable to pharmacological therapy with gastroesophageal reflux and a lack of impaired food transport and anatomical changes that carry the risk of developing life-threatening complications, repeated surgical intervention was considered unjustified.

Gastroesophageal reflux refractory to conservative treatment (mixed or alkaline type) was an indication for revision surgery in 35 (50.7%) patients. In 25 (36.2%) cases, the need for repeated surgical intervention was due to impaired food transport through the stomach displaced into the mediastinum and in 1 (1.4%) case, by dislocation into the chest cavity through the hiatal opening of the small bowel loops.

In 58 (95.1%) of all patients who underwent repeated surgery, surgical intervention was performed laparoscopically, in 3 (4.9%) patients with a pronounced adhesive process in the abdominal cavity that prevented the safe performance of the surgery, it was carried out through left-sided thoracotomy. Regardless of the access, the revision methodology always involved the elimination of the hiatal hernia and the implementation of antireflux reconstruction.

In 54 (88.5%) cases, complete restoration of normal anatomy was achieved. In this group of patients, in order to reduce the risk of disease recurrence, plasty of the hiatus hole was always performed using a prosthetic material (reinforcement of pre-sutured diaphragm legs with a polypropylene mesh implant using the mesh reinforcemet technique). In 7 (11.5%) cases, when the esophagus was shortened (the length of its abdominal section was less than 2 cm), the fundoplication cuff was initially created in the chest cavity. In such situations, the repair of the hiatus hole was carried out only with one's own tissues to prevent the edge of the prosthesis from contacting the wall of the esophagus or stomach, which carries the risk of severe complications.

Complications during repeated surgery occurred only with laparoscopic access and were observed in 11 (18.0%) patients: pneumothorax developed in 7 (11.4%), bleeding in 2 (3.3%), and perforation of the hollow organ (once the esophagus and stomach) in 2 (3.3%). All these complications were recognized and eliminated during the surgical intervention without a change in strategy.

The average duration of surgery was 190 min, and the average bed-stay was 14 days. The frequency of delayed side effects typical for this type of surgery (transient dysphagia, disturbances in the mechanisms of belching and vomiting, flatulence) was 28.3%. In all patients, these phenomena regressed on their own within 4–8 weeks.

Long-term results were evaluated in 57 (93.4%) patients within 12–48 months using instrumental methods of investigation.

Repeated recurrence of hiatus hernia of the diaphragm was detected in six (10.5% of patients with studied long-term results) cases. All patients in this group showed displacement of the gastroesophageal transition into the mediastinum without signs of impaired food transport. In two cases, there were no clinical manifestations of recurrent hiatal hernia; in four cases, symptoms of gastroesophageal reflux, which had been present before the second surgery, resumed.

In 44 (77.2%) cases, the natural anatomical positions of the abdominal organs, the absence of clinical and instrumental signs of pathology of the upper digestive tract were documented.

In 7 (12.3%) patients with a fundoplication cuff formed in the chest, its initial position was established. One person in this group retained minimal manifestations of gastroesophageal reflux, which were present before the second surgery.

Many aspects of the surgical treatment of recurrent hiatal hernias have been discussed. To date, there have been no generally accepted views on the indications for repeated surgery for this type of pathology. Unsolved issues of revision surgeries for hiatal hernias remain their technical complexity and insufficient long-term treatment results.

The analysis presented in this work allows us to consider, as justified indications for repeated surgical treatment of recurrent hiatal hernias, gastroesophageal reflux refractory to conservative therapy or anatomical disorders that cause or carry a risk of developing life-threatening acute conditions.

The results obtained in the study confirm a higher incidence of intraoperative complications of repeated surgeries for hiatal hernias. However, a rational choice of surgical access, timely detection, and elimination of the resulting errors allow a good immediate result to be achieved.

The proposed differentiated surgical tactics, implying a complete restoration of the natural anatomy and strengthening of the diaphragm peduncles with a prosthetic material at a normal esophageal length and the formation of a fundoplication cuff in the mediastinum with plasty of the hiatal foramen only with one's own tissues while shortening the esophagus, make it possible to achieve long-term results comparable to those of primary surgery.

CONCLUSIONS

1. Indications for surgical treatment of recurrent hiatal hernias should be based on the peculiarities of the dysfunction and anatomy of the upper digestive tract, taking into account the possibility of correction by conservative methods. Repeated surgical interventions for this pathology are indicated in the presence of gastroesophageal reflux refractory to pharmacological therapy or the occurrence of anatomical disorders that carry the risk of developing life-threatening conditions.

2. Repeated surgical interventions for recurrent hiatal hernias are technically difficult. The incidence of significant intraoperative complications is 6.6%.

3. Timely identification and elimination of complications that have arisen do not affect the immediate and long-term results of treatment.

4. The choice of a surgical tactic for recurrent hiatal hernias should be determined depending on the characteristics of the anatomical changes. With the shortening of the esophagus, the formation of a fundoplication cuff in the mediastinum with the plastic of the hiatal opening only with its own tissues is shown. With a normal esophageal length, it is possible to completely restore the natural anatomy by strengthening the diaphragm legs with a polymer prosthesis.

5. Revision surgical interventions for hiatal hernias can achieve good long-term results in 89.5% of cases.

REFERENCES

1. Василевский Д.И., Дворецкий С.Ю., Тарбаев И.С., Ахматов А.М. Пути повышения эффективности хирургического лечения грыж пищеводного отверстия диафрагмы // Вестник хирургии им. И.И. Грекова. – 2018. – Т. 177. – № 6. – С. 16–19. [Vasilevsky DI, Dvoretsky SYu, Tarbaev IS, Ahmatov AM. Problems and ways of improving the efficiency of surgical treatment of hiatal herniae. *Grekov's bulletin of surgery*. 2018;177(6):16–19. (In Russ.)]. https://doi.org/10.24884/0042-4625-2018-177-6-16-19.
2. Луцевич О.Э., Галлямов Э.А., Ерин С.А., и др. Лапароскопическая рефундопликация или 63 месяца без изжоги // Московский хирургический журнал. – 2017. – № 2. – С. 18–24. [Lutsevich OE, Gallyamov EA, Erin SA, et al. Laparoskopicheskaya refundoplikatsiya ili 63 mesyatsa bez izzhogi. *Moscow Surgical Journal*. 2017;(2):18-24. (In Russ.)]
3. Федоров В.И., Бурмистров М.В., Сигал Е.И., и др. Анализ повторных и реконструктивных операций у пациентов с грыжами пищеводного отверстия диафрагмы // Эндоскопическая хирургия. – 2016. – Т. 22. – № 6. – С. 3–6. [Fedorov VI, Burmistrov MV, Sigal EI, et al. Analysis of repeated and reconstructive surgeries in patients with hiatal hernia. *Endoskopicheskaya khirurgiya*. 2016;22(6):3-6. (In Russ.)]
4. Черноусов А.Ф., Хоробрых Т.В., Ветшев Ф.П. Хирургическое лечение больных с приобретенным коротким пищеводом // Вестник Национального медико-хирургического центра им. Н.И. Пирогова. – 2011. – Т. 6. – № 1. – С. 28–35. [Chernousov A., Horobrih T., Vetshev F. Surgical treatment of patients with acquired short esophagus. *Vestnik Natsional ĥogo medicokhirurgicheskogo Tsentra im. N. I. Pirogova*. 2011;6(1):28-35. (In Russ.)]
5. Celasin H, Genc V, Celik SU, Turkcapar AG. Laparoscopic revision surgery for gastroesophageal reflux disease. *Medicine*. 2017;96:1-5. https://doi.org/10.1097/MD.0000000000005779.
6. Daigle C, Funch-Jensen P, Calatayud D. Laparoscopic repair of paraesophageal hernia with anterior gastropexy: a multicenter study. *Surg. Endosc*. 2015;29(7):1856-1861. https://doi.org/10.1007/s00464-014-3877-z.
7. Frantzides C, Carlson M, Loizides S, et al. Hiatal hernia repair with mesh: a survey of SAGES members. *Surg. Endosc*. 2010;24(5):1017-1024. https://doi.org/10.1007/s00464-009-0718-6.
8. Frantzides C, Madan A, Carlson M, et al. Laparoscopic Revision of Failed Fundoplication and Hiatal Herniorraphy. *J Laparoendosc Adv Surg Tech A*. 2009;19:135-139. https://doi.org/10.1089/lap.2008.0245.
9. Granderath F, Kamolz T, Pointner R. Gastroesophageal reflux disease. Springer-Verlag, Wien; 2006. 320 p.

10. Higashi S, Nakajima K, Tanaka K, et al. Laparoscopic anterior gastropexy for type III/IV hiatal hernia in elderly patients. Surg Case Rep. 2017;3:1-6. https://doi.org/10.1186/s40792-017-0323-1.
11. Kohn G, Price R, Demeester S, et al. Guidelines for the Management of Hiatal Hernia. SAGES; 2013. 26 p.
12. Memon M. Hiatal Hernia Surgery. Springer International Publishing AG; 2018. 309 p.

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