

A rare case of complicated hernioplasty and reconstruction of the gastroesophageal junction: multistage treatment with a positive outcome

Y. Kondratskyi, N. Koval, A. Kolesnyk, Y. Shudrak, O. Dobrzanskyi, M. Pepenin, V. Turchak, A. Horodetskyi, Y. Svichkar, I. Ukrainets, E. Kozak

National Cancer Institute, Kyiv

✉ Nataliia Koval: nataliakoval526@gmail.com

Y. Kondratskyi, <http://orcid.org/0000-0003-3664-5903>

N. Koval, <http://orcid.org/0009-0006-0195-0798>

A. Kolesnyk, <http://orcid.org/0009-0005-1824-3179>

Y. Shudrak, <http://orcid.org/0009-0003-6270-2518>

O. Dobrzanskyi, <http://orcid.org/0000-0001-9422-4977>

M. Pepenin, <http://orcid.org/0009-0008-1803-1979>

V. Turchak, <http://orcid.org/0000-0002-1002-4466>

A. Horodetskyi, <http://orcid.org/0009-0003-7902-9809>

Y. Svichkar, <http://orcid.org/0009-0008-5682-1234>

I. Ukrainets, <http://orcid.org/0009-0009-3968-2858>

E. Kozak, <http://orcid.org/0009-0005-0726-2307>

This clinical case presents the complex and multistage management of a 48-year-old woman with a recurrent hiatal hernia following previous laparoscopic surgical treatment. The initial surgery was complicated by technical errors, leading to early recurrence of the hernia. Subsequent laparoscopic reintervention included mesh-reinforced hernioplasty and revision fundoplication. However, the postoperative course was complicated by the development of acute gastric fundus ischemia and necrosis, which necessitated urgent atypical wedge resection of the stomach. Despite initial recovery, the patient later developed further complications, including a mesh-related gastric ulceration and the formation of a chronic inflammatory infiltrate in the upper abdominal cavity. These adverse events required a relaparotomy, complete mesh removal, proximal gastrectomy, and complex gastrointestinal reconstruction using the double-tract method. The management of this case illustrates several critical challenges: the risk of ischemic complications following fundoplication, the long-term sequelae of mesh implantation at the gastroesophageal junction, and the technical considerations necessary for successful reconstruction after proximal gastrectomy. Special attention was paid to minimizing postoperative reflux, preserving nutritional function, and ensuring a high quality of life. This clinical case highlights the importance of careful patient selection, meticulous surgical technique, and the necessity for early recognition and management of postoperative complications. Through a stepwise, multidisciplinary surgical approach, a positive long-term outcome was achieved, with the patient demonstrating good tolerance to a regular diet, no signs of reflux, and satisfactory functional recovery.

KEYWORDS

hiatal hernia, fundoplication, surgical complications, double-track reconstruction, gastric necrosis, mesh erosion.

ARTICLE • Received 2025-02-09 • Received in revised form 2025-03-13

© 2025 Authors. Published under the CC BY-ND 4.0 license

Hiatal hernia is a prevalent condition that can present with heartburn, postprandial discomfort, and epigastric pain. When conservative therapy fails, surgical intervention becomes necessary. Laparoscopic cruroplasty remains the standard surgical approach for controlling reflux symptoms rather than for repairing

the hernia itself. However, postoperative complications, including hernia recurrence, gastric necrosis, and mesh-related erosion, may significantly impair outcomes and require complex reoperations.

The presented case is of particular clinical interest due to the rare combination of gastric fundus

necrosis and mesh erosion into the gastric lumen, following laparoscopic hiatal hernia repair and fundoplication. These complications underscore the importance of meticulous surgical technique, proper selection of mesh material, and vigilant postoperative surveillance.

According to published data, the recurrence rate of hiatal hernia after primary laparoscopic surgery ranges between 10 % and 30 %, depending on technical factors and patient-specific risks. Complications such as ischemic damage to the gastric fundus or mesh-related erosion are rare but life-threatening, often necessitating urgent intervention and reconstructive procedures.

Clinical case

In 2016, a 48-year-old female patient began experiencing heartburn and discomfort in the epigastric region. Conservative management provided only partial symptom relief. In 2020, she underwent laparoscopic Nissen fundoplication at a local clinic. No concurrent cruroplasty was documented. One month postoperatively, she experienced a recurrence of heartburn and discomfort. Imaging and endoscopic evaluation confirmed a recurrent hiatal hernia. However, no surgical revision was pursued over the next three years due to the moderate severity of her symptoms.

In February 2023, the patient presented to the National Cancer Institute (NCI) with worsening symptoms, including severe heartburn, regurgitation, and epigastric pain. Diagnostics, including esophagogastroduodenoscopy (EGD) and contrast-enhanced computed tomography (CT), identified a large sliding hiatal hernia (type I) with significant anatomical disruption. (Status post-surgical treatment for hiatal hernia. At the level of the diaphragmatic segment, the esophageal lumen was dilated up to 18.7 mm, and the esophageal wall thickness measured 13.7 mm. At the gastroesophageal junction, the gastric wall prolapsed towards the left and superiorly, measuring up to 23.0 × 15.6 mm.) Conservative management was deemed ineffective, and redo laparoscopic surgery was indicated to prevent progressive esophageal damage.

The surgical team opted for laparoscopic hernioplasty with synthetic mesh reinforcement. Intraoperatively, technical errors from the initial fundoplication were revealed: inadequate mobilization of the gastric fundus and excessive tension on the Dor's fundoplication wrap (Fig. 1). The hernia defect measured approximately 3 cm, and the hernia sac contained both the gastric cardia and proximal body without signs of incarceration.

A complete takedown of the previous fundoplication was performed, followed by refashioning a new 360-degree wrap. A 12-cm Symbotex composite mesh was applied after posterior cruroplasty using non-absorbable sutures with moderate tension.

The laparoscopic view reveals anatomical disarrangement and improper fixation of the gastric wrap. These findings confirmed the cause of early hiatal hernia recurrence and justified the need for surgical revision.

Three hours postoperatively, the patient was transferred to a specialized department. After 23 hours, her condition acutely deteriorated, exhibiting clinical signs of hollow organ perforation, including severe abdominal pain, tachycardia, and signs of peritonitis.

An emergency laparotomy, performed approximately 24 hours after the initial surgery, revealed diffuse fibrinous peritonitis and a large area of gastric fundus necrosis. The gastric fundus and greater curvature were severely ischemic, flaccid, and cyanotic. A necrotic perforated ulcer of the gastric fundus was visualized, characterized by necrotic, undermined («lip-like») edges, measuring up to 7 cm in diameter. Resection of the greater curvature of the stomach was performed using surgical staplers, with additional peritonization of the staple line. A nasogastric tube was placed for gastric decompression. Intraoperative endoscopy was conducted to assess staple line integrity: the stomach was airtight, and resection was performed within healthy tissue margins.

The postoperative course was uneventful, and the patient was discharged in satisfactory condition on postoperative day 5.

Over the next six months, the patient remained asymptomatic. However, in August 2024, she began experiencing postprandial discomfort and periodic nausea, which gradually worsened, but she did not

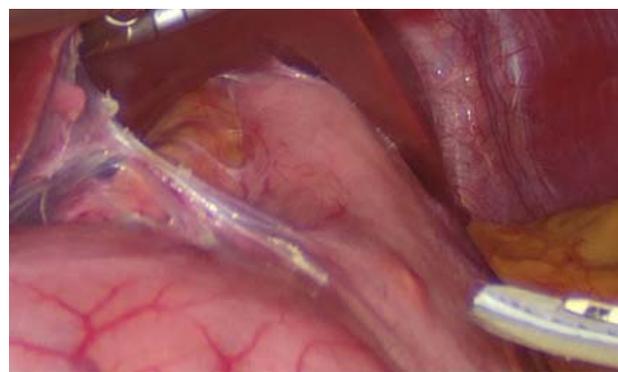


Figure 1. **Intraoperative image during redo hernioplasty demonstrating technical failure of the previous fundoplication**

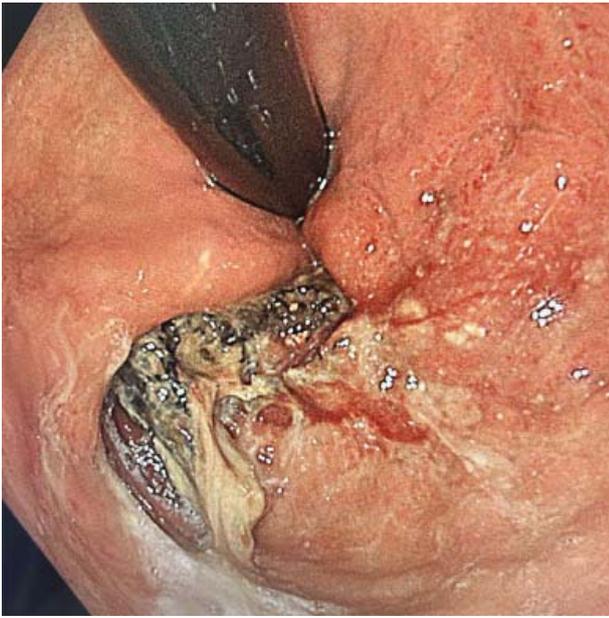


Figure 2. Endoscopic image showing mesh-induced pressure necrosis penetrating into the gastric lumen

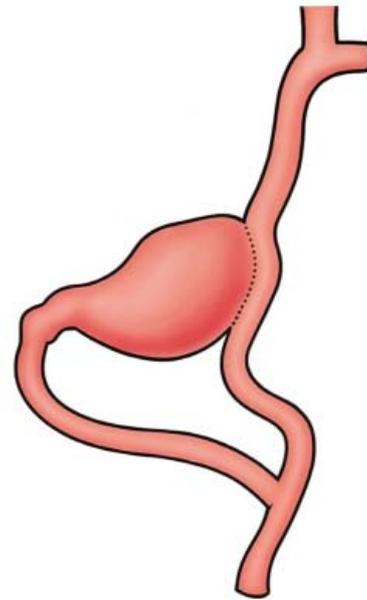


Figure 3. Diagram of the upper gastrointestinal tract after proximal gastrectomy with double-track reconstruction

seek medical help. By September 2024, the pain intensity reached 8 out of 10 on the visual analog scale after eating, prompting her readmission to the NCI.

Repeat EGD revealed a deep mucosal defect on the gastric staple line, with evidence of mesh erosion into the gastric lumen (Fig. 2).

Contrast-enhanced CT confirmed the absence of gastrointestinal perforation or extraluminal leakage.

A deep ulcerative defect is visible at the site of prior hernioplasty, consistent with mesh erosion. The lesion is characterized by necrotic margins and inflammatory changes in the surrounding mucosa. This finding was critical in confirming the diagnosis and planning for surgical intervention in the presented clinical case.

In September 2024, a planned relaparotomy was performed. Intraoperatively, dense adhesions were encountered, and the mesh was found to have eroded into the gastric remnant. A chronic inflammatory infiltrate involving the mesh and surrounding tissues was present. Proximal gastrectomy was performed with complete removal of the mesh and resection of the involved gastric segment.

Reconstruction was achieved using the double-track method: a Roux-en-Y esophagojejunostomy with an additional side-to-side gastrojejunostomy between the gastric remnant and the Roux limb, approximately 15 cm distal to the esophagojejunostomy (Fig. 3).

Postoperative recovery was uncomplicated, and the patient was discharged on postoperative day 7. As of the last follow-up in April 2025, the patient remained asymptomatic, tolerating a regular diet without significant weight loss or reflux symptoms.

Discussion

Hiatal hernia repair combined with laparoscopic fundoplication is a widely accepted method to manage symptomatic gastroesophageal reflux disease (GERD). However, fundoplication alone does not correct the anatomical defect of the hiatal hernia. Recurrence of hiatal hernia after repair ranges from 2% to 30%, according to various studies [3, 6, 13, 15, 19], depending on the quality of the initial surgical technique, hernia size, and patient factors such as obesity.

Most anatomical recurrent cases are asymptomatic or mildly symptomatic, but approximately 3–6% require surgical reintervention [14]. In this case, technical deficiencies during the initial fundoplication likely contributed to early hernia recurrence.

In the late postoperative period, our patient developed a complication – mesh erosion into the stomach, which clinically manifested as pain and symptoms of gastric dysfunction. Such complications related to mesh placement have been reported both after primary and revisional surgeries. The main mechanisms of mesh erosion include chronic inflammation, mechanical pressure on the gastric wall, and impaired mesh integration [1].

According to recent literature, prevention strategies for mesh erosion involve proper mesh positioning, minimizing direct contact between the mesh and the esophageal or gastric mucosa, and covering the mesh with adjacent tissues such as the hernia sac whenever possible [1]. Despite these precautions, mesh erosion remains a significant clinical problem, particularly after revisional surgeries [11].

Li et al. demonstrated that the esophagus is the most frequent site of erosion (50%), followed by the stomach (25%) and the gastroesophageal junction (23%) [11]. Mesh erosion typically occurs within two years after surgery and may necessitate complex reoperations, including distal esophageal or partial gastric resections. The type of mesh material (e.g., polytetrafluoroethylene [PTFE] or polypropylene) and the technical aspects of implantation play critical roles in determining the risk of erosion [11].

The choice of mesh material has a notable impact on outcomes. According to Lima et al., biosynthetic meshes may offer a lower risk of long-term complications compared to permanent synthetic meshes [12]. Although biosynthetic materials such as BIO-A or Phasix ST can reduce foreign body reactions and decrease the likelihood of erosion, direct contact between the mesh and gastrointestinal structures still carries a risk of serious complications [12].

Furthermore, a network meta-analysis by Rausa et al. demonstrated that nonabsorbable meshes were associated with lower hernia recurrence rates but higher risks of long-term complications such as erosion and migration, compared to absorbable meshes [17]. Therefore, when choosing the type of prosthesis, surgeons must balance the lower risk of anatomical recurrence against the higher probability of severe mesh-related complications.

In our case, given the evidence of mesh erosion into the stomach, the surgical team performed complete mesh removal, proximal gastrectomy, and double-track reconstruction to restore gastrointestinal continuity and minimize the risk of further complications.

During Nissen fundoplication, the gastric fundus is mobilized, wrapped around the esophagus, and sutured to form a cuff [10]. This process involves ligating short gastric vessels within the gastro-splenic ligament. Consequently, the blood supply to the gastric fundus relies solely on the right and left gastric arteries, providing limited perfusion in this area. Gastric fundus necrosis is a rare complication arising from impaired perfusion due to damage or ligation of its short vessels during surgery.

The development of gastric fundus necrosis post-operatively is a rare but life-threatening complication. Several mechanisms may contribute to this outcome:

1. **Vascular Damage:** Ligation of short vessels during the initial operation significantly reduces blood flow to the gastric fundus. Subsequent trauma to intramural vessels during revision surgery may exacerbate ischemia.

2. **Hypoxia and Secondary Inflammation:** Re-fundoplication and tissue tension during reconstruction mechanically disrupt microcirculation.

Impaired blood flow triggers hypoxia and a cascade of secondary inflammatory processes, leading to cell death, granulation tissue growth, and transmural damage.

Early recognition of ischemic complications is crucial for preventing severe outcomes.

To minimize the risk of necrosis in clinical practice:

- Damage to the vascular network during primary surgery should be minimized.
- Excessive tissue tension during cuff formation should be avoided.

Proximal gastrectomy and double-track reconstruction

Patients undergoing proximal gastrectomy often report heartburn, postprandial discomfort, and dumping syndrome [2]. In this case, double-track reconstruction was chosen after proximal gastrectomy, justified by several key factors:

Physiological advantages

Double-track reconstruction enhances (see Fig. 3) the patient's quality of life, preventing significant digestive disturbances such as gastric juice reflux, dumping syndrome, or anemia.

Double-track reconstruction is performed after standard Roux-en-Y reconstruction, adding a side-to-side anastomosis between the distal stomach and the Roux limb.

The image illustrates the anatomical configuration following resection of the upper third of the stomach, preserving the gastric remnant and continuity with the small intestine.

This approach provides two parallel pathways for food passage:

Direct passage to the distal small intestine via the jejunojejunostomy loop, minimizing gastric stasis and reflux.

Slower transit through the preserved stomach segment, allowing physiological digestion [23].

This partially preserves gastric digestive functions and improves nutrient absorption, particularly for iron, calcium, and B vitamins [4].

Long-term outcomes

Studies show that patients undergoing double-track reconstruction demonstrate:

- Lower rates of dumping syndrome.
- Better tolerance of solid food.
- Less pronounced weight disturbances compared to classical reconstruction.

These factors are especially important for this patient, who did not have oncological pathology, as the therapy aimed to treat complications and restore normal digestive function [16].

Reflux prevention

In cases requiring proximal gastrectomy for non-oncological conditions, double-track reconstruction effectively prevents severe gastroesophageal reflux, a common complication of standard esophagogastronomy.

Quality of life

The patient's recovery without significant dietary restrictions or postoperative complications (e.g., systemic inflammatory response, infections, or impaired transit) confirms the effectiveness of the chosen approach. High quality of life, minimal dietary limitations, and a return to normal daily activities underscore the benefits of double-track reconstruction.

Thus, the choice of double-track reconstruction was based on balancing surgical radicality, complication prevention, and patient optimization.

DECLARATION OF INTERESTS

The authors declare that they have no conflicts of interest.

Funding. The authors received no financial support for the research, authorship, and/or publication of this article.

ETHICS APPROVAL AND WRITTEN

INFORMED CONSENT STATEMENTS

The study was conducted in accordance with the Declaration of Helsinki. Written informed consent was obtained from the patient for publication of clinical details and images.

AUTHORS CONTRIBUTIONS

Y. Kondratskyi: conceptualization, surgery, supervision; N. Koval: surgical assistance, manuscript writing, data collection; A. Kolesnyk, Y. Shudrak, O. Dobrzanskiy, M. Pepenin: surgical assistance, data acquisition; V. Turchak, A. Horodetskyi, Y. Svichkar, I. Ukrainets, E. Kozak: postoperative care, literature review.

REFERENCES

- Braghetto I, Korn O, Rojas J, Valladares H, Figueroa M. Hiatal hernia repair: prevention of mesh erosion and migration into the esophagogastric junction. *Arq Bras Cir Dig.* 2020;33(1):e1489. doi: 10.1590/0102-672020190001e1489.
- Clinical Outcomes of Proximal Gastrectomy versus Total Gastrectomy for Proximal Gastric Cancer: A Systematic Review and Meta-Analysis. Lulu Zhao, Rui Ling, Jinghua Chen, Anchen Shi, Changpeng Chai, Fuhai Ma, Dongbing Zhao, Yingtai Chen. *Dig Surg.* 2021;38(1):1-13. doi: 10.1159/000506104.
- DeMeester TR, Bonavina L, Albertucci EM. Nissen fundoplication for gastroesophageal reflux disease: evaluation of primary repair in 100 consecutive patients. *Ann Surg.* 1986;204:9-20.
- Effect of Laparoscopic Proximal Gastrectomy With Double-Tract Reconstruction vs Total Gastrectomy on Hemoglobin Level and Vitamin B12 Supplementation in Upper-Third Early Gastric Cancer: A Randomized Clinical Trial. Park DJ, Han SU, Hyung WJ, et al. *JAMA Netw Open.* 2023;6(2):e2256004. doi: 10.1001/jamanetworkopen.2022.56004.
- Hiatal Hernia Repair: A Century Between Sorensen and da Vinci. McClinton A, Zarnegar R, Dakin G, Afaneh C. *Surg Clin North Am.* 2025;105(1):125-142. doi: 10.1016/j.suc.2024.06.010.
- Hunter JG, Trus TL, Branum GD, Waring JP, Wood WC. A physiologic approach to laparoscopic fundoplication for gastroesophageal reflux disease. *Ann Surg.* 1996;223:673-687.
- Hybrid hiatal hernia repair: is it cost-effective? Satoskar S, Kashyap S, Chang A, et al. *J Robot Surg.* 2022;16(6):1361-1365. doi: 10.1007/s11701-021-01364-8.
- Is fundoplication necessary after paraesophageal hernia repair? A meta-analysis and systematic review. Clapp B, Hamdan M, Mandania R, et al. *Surg Endosc.* 2022;36(8):6300-6311. doi: 10.1007/s00464-022-09024-0.
- Is it meaningful to add mesh reinforcement to laparoscopic fundoplication for esophageal hiatal hernias in patients with high risk of recurrence? Tsuboi K, Masuda T, Omura N, et al. *Esophagus.* 2024;21(1):67-75. doi: 10.1007/s10388-023-01026-8.
- Kane TD. Laparoscopic Nissen fundoplication. *Minerva Chir.* 2009;64(2):147-157. PMID:19365315.
- Li J, Cheng T. Mesh erosion after hiatal hernia repair: the tip of the iceberg? *Hernia.* 2019;23(6):1243-1252. doi: 10.1007/s10029-019-02011-w.
- Lima DL, de Figueiredo SMP, Pereira X, et al. Hiatal hernia repair with biosynthetic mesh reinforcement: a qualitative systematic review. *Surg Endosc.* 2023;37(10):7425-7436. doi: 10.1007/s00464-023-10379-1.
- Little AG, Ferguson MK, Skinner DB. Reoperation for failed anti-reflux operations. *J Thorac Cardiovasc Surg.* 1986;91:511-517.
- Morse C, Pennathur A, Luketich JD. Laparoscopic techniques in reoperation for failed antireflux repairs. In: Patterson GA, Pearson FG, Cooper JD, eds. *Pearson's textbook of thoracic and esophageal surgery.* Philadelphia, PA: Churchill Livingstone; 2008:367-375.
- Peters JH, DeMeester TR. Indications, benefits and outcomes of laparoscopic Nissen Fundoplication. *Dig Dis.* 1996;14:169-179.
- Quality of life comparison between esophagogastrectomy and double tract reconstruction for proximal gastrectomy assessed by Postgastrectomy Syndrome Assessment Scale (PGSAS)-45. Ikeda M, Takiguchi N, Morita T, et al. *Ann Gastroenterol Surg.* 2022;7(3):430-440. doi: 10.1002/ags3.12645.
- Rausa E, Manfredi R, Kelly ME, et al. Prosthetic reinforcement in hiatal hernia repair, does mesh material matter? A systematic review and network meta-analysis. *J Laparoendosc Adv Surg Tech A.* 2021;31(10):1118-1123. doi: 10.1089/lap.2020.0752.
- Role of fundoplication in treatment of patients with symptoms of hiatal hernia. Li ZT, Ji F, Han XW, et al. *Sci Rep.* 2019;9(1):12544. doi: 10.1038/s41598-019-48740-x.
- Smith DC, McClusky DA, Rajad MA, Lederman AB, Hunter JG. When fundoplication fails: redo? *Ann Surg.* 2005;241:861-871.
- Smith RE, Sharma S, Shahjehan RD. Hiatal Hernia. In: *StatPearls [Internet].* Treasure Island (FL): StatPearls Publishing; 2025 Jan-. PMID:32965871.
- Surgical strategies for recurrent hiatal hernia: three-point fundoplication fixation. Chu Y, Liu Y, Hua R, Yao Q. *BMC Surg.* 2025;25(1):18. doi: 10.1186/s12893-025-02760-9.
- The comparison of post-proximal gastrectomy digestive tract reconstruction methods. Yang Xia, Nengquan Sheng, Zhigang Wang, Qingchao Zhu. *MC Surg.* 2025;25(1):1. doi: 10.1186/s12893-024-02748-x.
- Useful of proximal gastrectomy with double-tract reconstruction in preventing glucose spikes. Fujimoto D, Taniguchi K, Takashima J, Kobayashi H. *J Gastrointest Surg.* 2024;28(9):1479-1484. doi: 10.1016/j.jgassur.2024.06.012.

Рідкісний випадок ускладненої герніопластики та реконструкції гастроезофагеального переходу: багатоетапне лікування з позитивним результатом

Ю. Кондрацький, Н. Коваль, А. Колесник, Є. Шудрак, О. Добжанський, М. Пепенін, В. Турчак, А. Городецький, Я. Свічкарь, І. Українець, Є. Козак

Національний інститут раку, Київ

У статті представлено клінічний випадок складного та багатоступеневого лікування 48-річної жінки з рецидивною грижею стравохідного отвору діафрагми після попереднього лапароскопічного хірургічного втручання. Первинна операція була ускладнена технічними помилками, що призвело до раннього рецидиву грижі. Повторне лапароскопічне втручання включало герніопластику із застосуванням сітчастого імплантанта та ревізійну фундоплікацію. Однак у післяопераційному періоді розвинулося гостре ішемічне ураження та некроз дна шлунка, що потребувало термінової атипової резекції шлунка клиноподібної форми. Попри початкове одужання, у пацієнтки згодом виникли додаткові ускладнення, зокрема утворення виразкового дефекту, спричиненого сіткою, та формування хронічного запального інфільтрату у верхньому відділі черевної порожнини. Ці стани потребували повторної лапаротомії, повного видалення сітки, проксимальної гастректомії та складної реконструкції шлунково-кишкового тракту за методом подвійного тракту. Представлений випадок демонструє низку критичних аспектів: ризик ішемічних ускладнень після фундоплікації, віддалені наслідки імплантації сітки в ділянці гастроезофагеального переходу та технічні особливості успішної реконструкції після проксимальної гастректомії. Особливу увагу було приділено мінімізації післяопераційного рефлюксу, збереженню харчової функції та забезпеченню високої якості життя. Цей клінічний випадок підкреслює важливість ретельного відбору пацієнтів, досконалої хірургічної техніки та своєчасного виявлення й корекції післяопераційних ускладнень. Завдяки поетапному, мультидисциплінарному підходу до лікування було досягнуто позитивного віддаленого результату: пацієнтка добре переносила звичний раціон, не мала ознак рефлюксу та продемонструвала задовільне функціональне відновлення.

Ключові слова: хітальна грижа, фундоплікація, хірургічні ускладнення, реконструкція за методом double-tract, некроз шлунка, пролежень від сітки.

FOR CITATION

■ Kondratskyi Y, Koval N, Kolesnyk A, Shudrak Y, Dobrzanskiy O, Pepenin M, Turchak V, Horodetskyi A, Svichkar Y, Ukrainets I, Kozak E. A rare case of complicated hernioplasty and reconstruction of the gastroesophageal junction: multistage treatment with a positive outcome. *General Surgery (Ukraine)*. 2025;(1):66-71. <http://doi.org/10.30978/GS-2025-1-66>.