



Esophagoplasty Using a Jejunum Segment on a Vascular Pedicle

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Aim: to substantiate the expediency of using a segment of the jejunum on a vascular pedicle in esophagoplasty.

Materials and methods. At the National Medical Research Center of Surgery named after A.V. Vishnevsky, 12 patients underwent esophagoplasty with a combined visceral transplant, of which 9 (75.0 %) received a gastrointestinal graft and 3 (25.0 %) — a colon-jejunum one. Esophagectomy with simultaneous esophageal plastic surgery was performed in 10 (83.3 %) patients, in 4 (40 %) of them — in combination with distal gastric resection. The indication for surgery in 3 patients was cicatricial stricture of the esophagus and stenosis of the pylorus, in 2 — achalasia of the cardia of the terminal stage (in one patient — with ulcerative stenosis of the pylorus). Three more patients underwent esophagectomy due to peptic strictures: esophagogastric anastomosis ($n = 1$), esophagoenteroanastomosis ($n = 1$) and esophagus after Nissen surgery ($n = 1$). Cancer recurrence after proximal gastric resection and gastrectomy in 2 patients was an indication for esophagectomy. Also, 2 (16.7 %) patients were hospitalized in the National Medical Research Center of Surgery named after A.V. Vishnevsky with incomplete esophagoplasty: one person — after Dobromyslov — Torek surgery for spontaneous rupture of the esophagus, and one patient — after the unsuccessful Lewis surgery for esophageal cancer performed in other hospitals.

Results. The average duration of post-operative stay was 12.7 ± 6.3 days. The postoperative period was smooth in 10 (83.3 %) patients. The failure of the cervical anastomosis was revealed in 1 (8.3 %) patient on day 5 after esophageal plastic surgery with colon-jejunum graft, which was resolved conservatively without repeated surgery. Relaparotomy was required in one patient on day 7 after surgery for bile peritonitis, the cause of which was destructive acalculous cholecystitis with perforation. All 12 patients were discharged from the clinic with full nutrition through the mouth. In the long-term period, 11 (91.7 %) patients remained under observation, 1 (9.1 %) developed an esophagogastric anastomosis stricture 1.5 months after esophageal plastic surgery, which was resolved by 4 courses of bougienage during the first 9 months after surgery. No other complications were noted.

Conclusion. The segment of the jejunum on the vascular pedicle, used for esophagoplasty, in the condition of a shortage of plastic material, allows not only to complete the reconstruction at once, but also to restore the natural passage of food and prevent bile reflux.

Keywords: esophagoplasty, jejunum segment on vascular pedicle, combined graft, jejunogastric anastomosis, deficiency of the visceral reserve

Conflict of interest: the authors declare no conflict of interest.

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Эзофагопластика с применением сегмента тощей кишки на сосудистой ножке

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Цель исследования: обосновать целесообразность применения сегмента тощей кишки на сосудистой ножке при эзофагопластике.

Материалы и методы. В ФГБУ «Национальный медицинский исследовательский центр хирургии им. А.В. Вишневского» 12 пациентам выполнили эзофагопластику комбинированным висцеральным трансплантатом. Из них 9 (75,0 %) пациентам сформировали желудочно-тощекишечный трансплантат и 3 (25,0 %) — толсто-тощекишечный. С незавершенной эзофагопластикой после лечения в других стационарах госпитализированы 2 (16,7 %) пациента: один пациент ранее перенес операцию Добромыслова — Торека по поводу спонтанного разрыва пищевода и один — операцию Льюиса, выполненную при раке пищевода, которая осложнилась несостоятельностью пищевода-желудочного соустья. Эзофагэктомию с одномоментной пластикой пище-

вода выполнили 10 (83,3 %) пациентам, у 4 (40 %) из них — в сочетании с дистальной резекцией желудка. Показанием к операции у 3 больных явилась рубцовая стриктура пищевода и стеноз привратника, у 2 — ахалазия кардии терминальной стадии (у одного пациента — с язвенным стенозом привратника). Еще 3 больным эзофагэктомию выполнили по причине пептических стриктур: эзофагогастроанастомоза ($n = 1$), эзофагоэнтероанастомоза ($n = 1$) и пищевода после операции Ниссена ($n = 1$). Рецидив рака после проксимальной резекции желудка и гастрэктомии у 2 больных явился показанием к эзофагэктомии.

Результаты. Медиана продолжительности послеоперационного периода составила 11 [7; 29] дней. Послеоперационный период был гладким у 10 (83,3 %) пациентов. Несостоятельность шейного соустья выявлена у 1 (8,3 %) больного на 5-й день после пластики пищевода толсто-тощекишечным трансплантатом, которая разрешилась консервативно без повторной операции. Релапаротомия потребовалась 1 больному на 7-й день после операции по поводу желчного перитонита, причиной которого стал деструктивный бескаменный холецистит с перфорацией. Всех 12 пациентов выписали из клиники с полноценным питанием через рот. В отдаленном периоде под наблюдением оставались 11 (91,7 %) больных; у 1 (9,1 %) пациента через 1,5 месяца после пластики пищевода желудочно-тощекишечным трансплантатом развилась стриктура эзофагогастроанастомоза, которая разрешилась 4 курсами бужирования в течение первых 9 месяцев после операции. Других осложнений не отмечено.

Выводы. Сегмент тощей кишки на сосудистой ножке, используемый в целях эзофагопластики, в условиях дефицита пластического материала позволяет не только одномоментно завершить реконструкцию, но и восстановить естественный пассаж пищи и предотвратить желчный рефлюкс.

Ключевые слова: эзофагопластика, сегмент тощей кишки на сосудистой ножке, комбинированный трансплантат, еюногастропластика, дефицит висцерального резерва.

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Introduction

The stomach is a preferred plastic material for esophagoplasty, as it ensures the normal progression of the digestive process and has a reliable blood supply. Therefore, esophagoplasty using a gastric tube is considered standard in specialized centers [1, 2]. However, the use of the stomach for esophageal surgery may not always be possible due to combined injuries, concomitant conditions, or damage to the extensive vascular network around the stomach after previous interventions. In such cases, colonic or intestinal esophagoplasty may be performed, which carries a higher risk of complications and requires more labor [3]. One challenge in esophagoplasty is how to address esophageal repair with an initially inadequate graft length, necrosis or ischemia at the proximal end, in cases where there is limited access to plastic material. This issue remains unresolved. These circumstances force surgeons to abandon primary esophageal repair, leading to multi-stage procedures that prolong treatment and worsen quality of life for patients. As surgical activity and operations on the esophagus increase, so does the number of failed procedures and patients with incomplete esophageal reconstruction. This drives the constant search for ways to rationally use visceral plastic materials to create an artificial esophagus and achieve complete reconstruction.

Aim: to justify the use of a jejunal segment on a vascular pedicle for esophageal replacement.

Materials and methods

In the Department of Reconstructive Surgery of the Esophagus and Stomach at the National Medical Research Center for Surgery named after A.V. Vishnevsky (NMRC), a segment of the jejunum on a vascular pedicle was used as a constructive component in 12 patients undergoing combined visceral graft esophagoplasty. Of these patients, 9 formed a gastrointestinal graft, and 3 formed a coloenteric one. Esophagectomy was performed using a transhiatal approach in 6 patients and using a transthoracic approach in 4 patients. The artificial esophagus was placed in the posterior mediastinum in 10 patients and retrosternally — in 2 patients.

Esophagoplasty with simultaneous esophageal reconstruction with a combined transplant was performed in 10 patients. Of these, 4 (40.0 %) underwent the procedure together with distal gastrectomy. Indications for surgery in 3 patients were cicatricial stricture of the esophagus and pyloric stenosis after a combined burn, in 1 patient — terminal stage achalasia of the cardia with ulcerative stenosis of the duodenum. In another 3 patients, esophagectomy was performed due to stricture of the esophagogastrostomy after the Lewis operation ($n = 1$), cuff migration into the mediastinum after Nissen fundoplication with the development of severe reflux esophagitis ($n = 1$) and achalasia of the cardia stage IV ($n = 1$). Indication for delayed

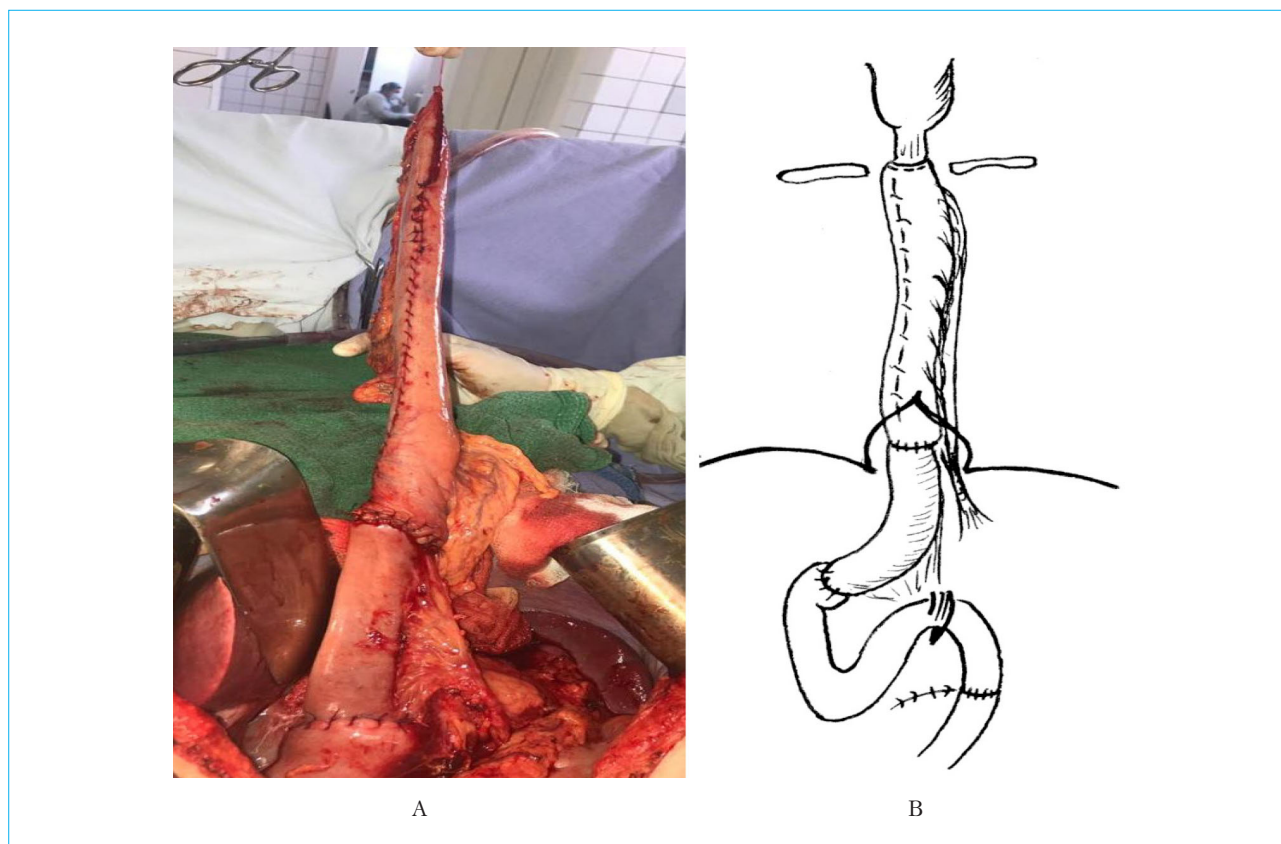


Figure 1. Gastrointestinal graft: A — intraoperative photo of the conduit; B — diagram of the completed reconstruction

Рисунок 1. Желудочно-тонкокишечный трансплантат: А — интраоперационное фото кондукта; В — схема завершённой реконструкции

surgery in 2 patients was incomplete esophagoplasty after esophagectomy: in 1 patient — after the Dobromyslov — Torek operation performed for spontaneous rupture of the esophagus, in 1 patient — after an unsuccessful Lewis operation for esophageal cancer.

Subtotal esophagoplasty with a gastrointestinal graft (Fig. 1) was performed due to the shortage of the gastric conduit length. The stomach was resected in 7 patients: in 4 patients — during esophagectomy performed at the NMRC, and in 3 patients — at previous stages of treatment. Damage to the epigastric arch during gastrostomy formation at another medical institution was detected in 1 patient; in another patient, the right gastroepiploic artery was short, which did not allow creating a transplant of sufficient length. After transection of the duodenum, the proximal end of the short gastric conduit was brought out to the neck, and the resulting diastasis with the duodenum was replaced with a segment of jejunum on a vascular pedicle [4].

Esophagectomy with esophagoplasty using a coloenteric graft was performed in 2 patients

(16.7 %) due to recurrent gastric cancer, which was localized in the area of the esophagogastrotomy after proximal gastrectomy in 1 patient and in the esophagojejunostomy after gastrectomy in 1 patient. In another patient, the indication for esophagectomy was an extended peptic stricture that developed 8 years after gastrectomy. During the operation, a segmental type of angioarchitecture of the colon was established, which did not allow forming a graft of sufficient length. The short colonic segment was moved proximally and pulled to the neck, and reduodenization was performed using a jejunal insertion (Fig. 2). In this case, a 25-cm-long segment was mobilized on the 3rd pair of jejunal vessels and positioned isoperistaltically.

Results

The postoperative period was smooth in 10 (83.3 %) patients. Its average duration was 12.7 ± 6.3 days. Relaparotomy was required in 1 (8.3 %) patient on the 7th postoperative day due to biliary peritonitis, the cause of which was destructive acalculous cholecystitis with

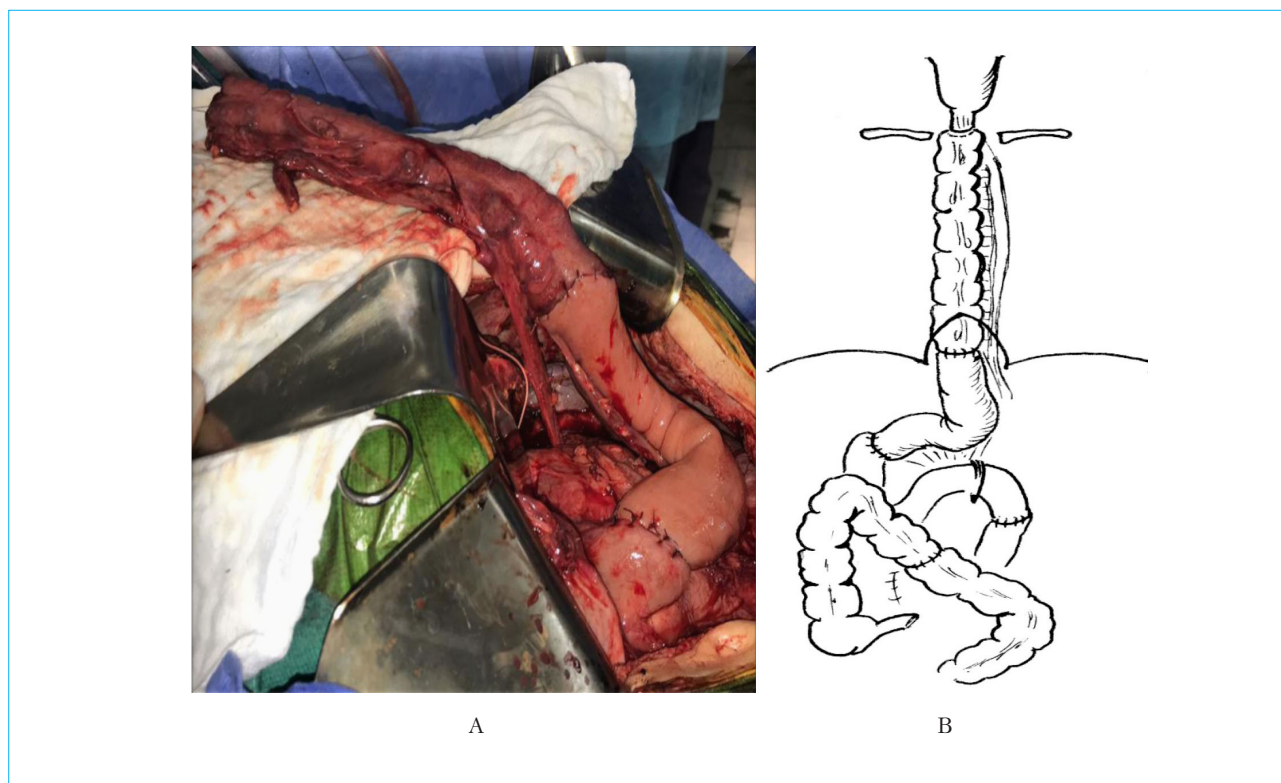


Figure 2. Coloenteric graft: A — intraoperative photo of the formed graft; B — schematic of the completed view of the reconstruction

Рисунок 2. Толсто-тонкокишечный трансплантат: А — интраоперационное фото сформированного трансплантата; В — схематично завершённый вид реконструкции

perforation. Incompetence of the cervical anastomosis was detected in 1 patient on day 5 after esophagoplasty with coloenteric graft. Leakage of the anastomosis was revealed during control radiography with oral administration of water-soluble contrast in the form of a linear flow into the mediastinum without clinical manifestations. The patient received parenteral and enteral nutrition for 5 days and at day 10 after surgery there were no longer signs of failure on the control radiograph. All 12 patients were discharged from the clinic with adequate oral nutrition.

In the long-term follow-up, 1 patient (8.3 %) was lost to follow-up immediately after discharge. The remaining 11 patients (91.7 %) were under dynamic control. Of these, 3 patients (27.3 %) died. The cause of death for 1 patient was the progression of a malignant stomach tumor 1.5 years after reconstructive surgery. The other 2 (18.2 %) patients died from pneumonia (1 — COVID-19-associated) 1 and 3 months after discharge from the hospital. The observation period ranged from 1 to 6 years. In 1.5 months, 1 (9.1 %) patient after esophageal plastic surgery with a gastrointestinal

graft developed esophagogastrostomy stricture, which resolved with 4 courses of bougienage during the first 9 months after surgery. No other complications were reported.

Weight gain in the long-term period was recorded in all patients, in 2 (25.0 %) — from 1 to 5 kg, and in 6 (75.0 %) — from 5 kg and above. In the general group of patients, the median body weight was 55.5 [50; 61] kg before surgery, and 60 [54; 75] kg after. The median body mass index before surgery was 16.5 [15; 21] kg/m², in the long-term period — 20.4 [19; 25.5] kg/m². Diet and nutrition regimen are not followed by 4 (50 %) patients, i.e. they stick to general diet, they also have fully restored their work activity and returned to their previous jobs. The other 4 patients strictly adhere to 4–5 meals a day and the diet prescribed by the gastroenterologist.

Complaints of heartburn after eating were detected in 1 (12.5 %) patient after esophageal plastic surgery with a gastrointestinal graft, which was relieved by taking antacid medications. At the same time, no signs of reflux esophagitis were detected in any patient according to EGD. There

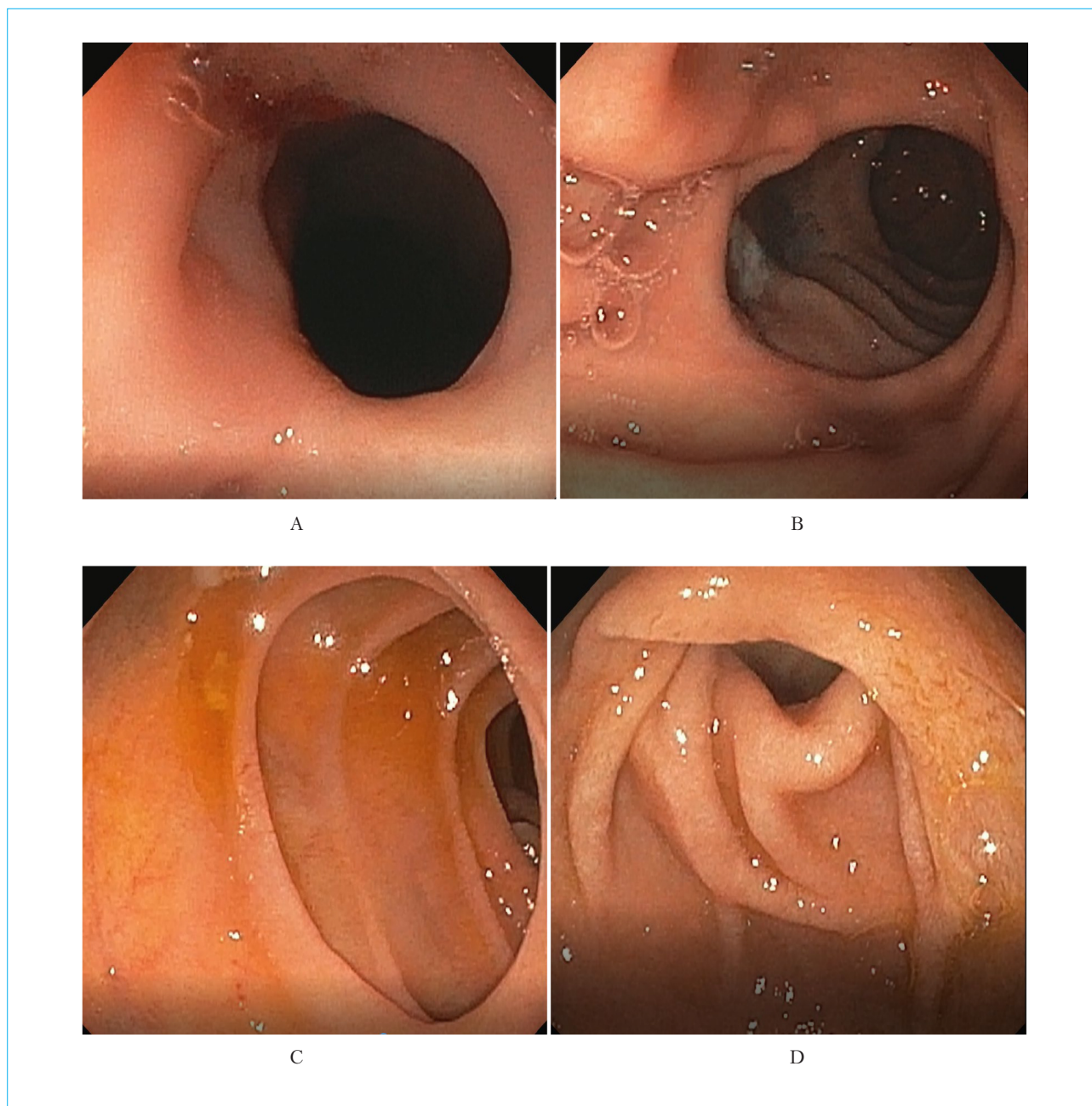


Figure 3. Endoscopic examination of the gastrointestinal graft 3 years after surgery: A — esophageal anastomosis; B — gastro-intestinal junction; C — jejunal insertion; D — duodenal anastomosis

Рисунок 3. Эндоскопическое исследование желудочно-тонкокишечного трансплантата через 3 года после операции: А — пищеводный анастомоз; В — желудочно-тонкокишечное соустье; С — тощекишечная вставка; D — дуоденальный анастомоз

were also no traces of bile in the gastric and colonic segments of the combined transplant. Duodenal contents were found only in the jejunal insert, which, due to the isoperistaltic orientation of the segment, did not reach the esophageal anastomosis (Fig. 3).

Long-term radiography was performed on 6 patients: 5 — after esophageal plastic surgery with a gastrointestinal graft and 1 — after plastic surgery

with a coloenteric graft. The esophageal anastomoses showed no signs of contrast aspiration into the airways (Fig. 4A). The gastric and colonic segments of the graft were not deformed and did not have any pathological narrowings or bends. The contrast was evacuated almost immediately to the jejunal segment and was distributed evenly throughout it. In all observations, there was an expansion of the proximal segment over time,

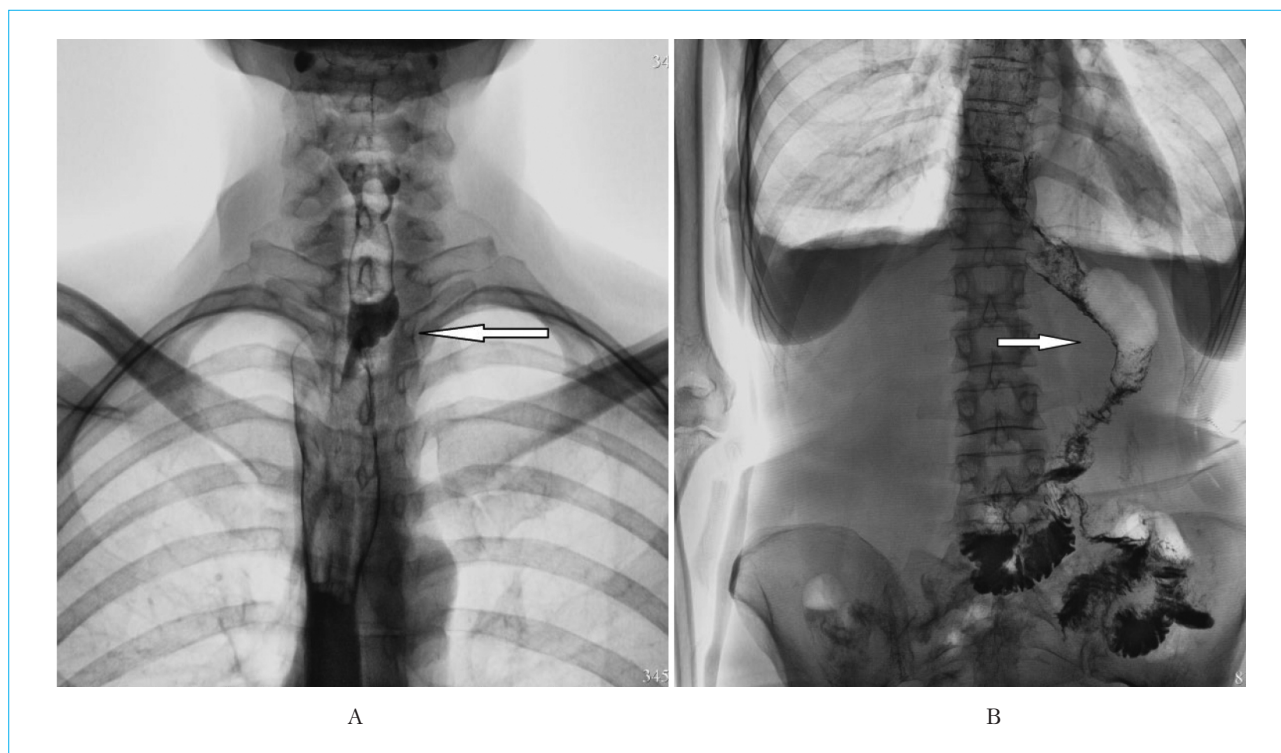


Figure 4. Radiographs of the gastrointestinal graft with oral administration of barium sulfate 3 years after surgery: the arrows indicate the esophageal anastomosis (A) and the jejunal segment (B)

Рисунок 4. Рентгенограммы желудочно-тонкокишечного трансплантата с пероральным приемом сульфата бария через 3 года после операции: стрелками указаны пищеводный анастомоз (А) и тощекишечный сегмент (В)

with smoothing of the Kerckring folds (Fig. 4B). The first portions of contrast entered the duodenum immediately after the intestinal segment was filled and were deposited there. Subsequent evacuation was in stages, as the duodenal papilla was emptied. Therefore, the portioned evacuation of contrast from the graft depends on the contractility of the duodenum and the initial portions of the jejunum. The jejunal segment in the combined graft has the ability to expand and partially acts as a reservoir. In one observation, the width of the segment was between 3.5 and 4.5 cm throughout its entire length (Fig. 5), without any delay in emptying into the duodenum. We believe that it is not necessary to consider the reservoir function of the jejunal segment separately from the time it takes for food to empty into the duodenum, as the rate of emptying is determined by a combination of factors. Over time, the distal part of the graft assumes a horizontal position, with its curvature preventing contrast from passing “through” into the duodenum and causing regurgitation (Fig. 5A).

The results of the combined esophageal plastic surgery using visceral fragments with a natural blood supply were considered favorable, considering the fact that for this group of patients, the

possibility of restoring full oral nutrition had been uncertain.

Discussion

Today, it may seem that jejunal esophagoplasty, which was the main option for replacing the esophagus at the dawn of reconstructive surgery, has been unfairly forgotten. In 1906, the Swiss surgeon S. Travel from Bern, using a segment of jejunum on a vascular pedicle, improved gastrostomy by creating a conduit between the stomach and the anterior abdominal wall [5]. The author positioned the segment antiperistaltically with respect to the stomach, expecting that reverse peristalsis would prevent gastric contents from escaping. This surgical technique was the prototype for jejunoesophagoplasty.

In the same year, S. Roux performed a subtotal small intestinal subcutaneous esophageal plasty on an 11-year-old boy who had suffered from a caustic soda-induced narrowing of the esophagus [6]. The patient required gastrostomy and S. Roux decided to mobilize a long segment of small intestine according to S. Travel’s technique in order to extend it beyond the epigastric region and connect

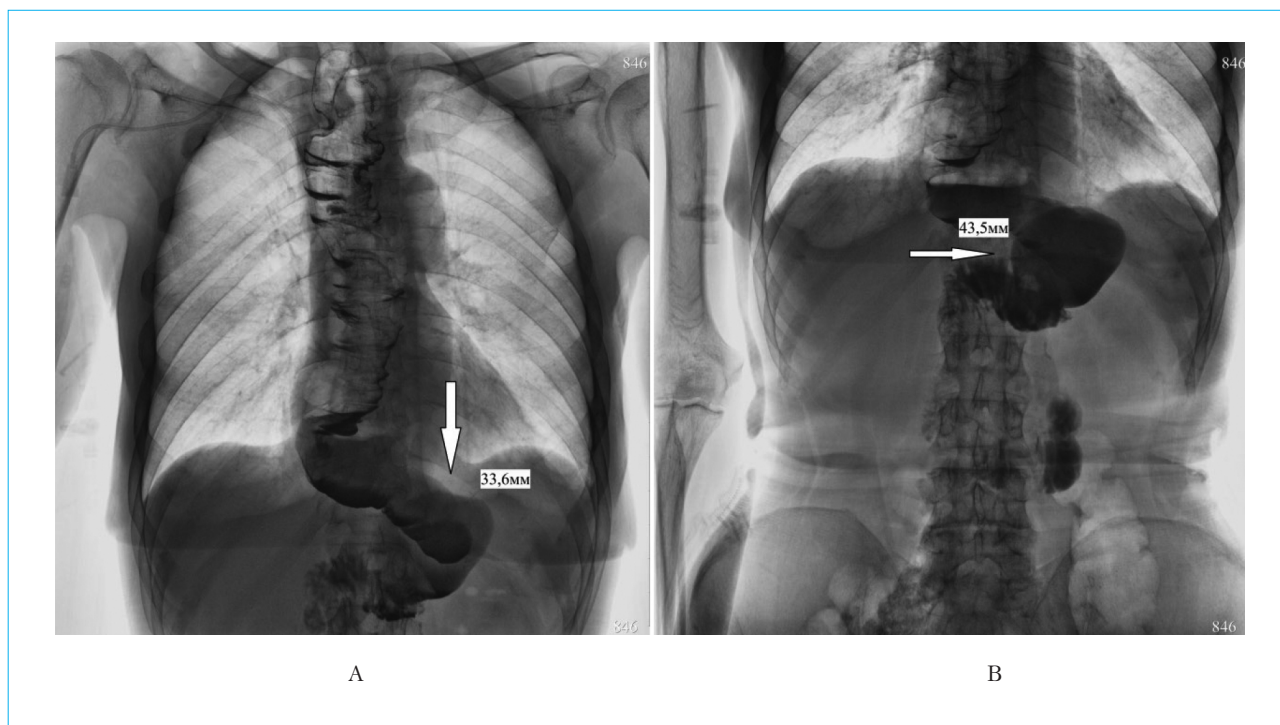


Figure 5. Radiographs of the coloenteric graft with oral administration of barium sulfate 1 year after surgery: arrows indicate the jejunal insertion immediately after administration of contrast (A) and in 3 minutes (B)

Рисунок 5. Рентгенограммы толсто-тонкокишечного трансплантата с пероральным приемом сульфата бария через 1 год после операции: стрелками указана тощекишечная вставка сразу после приема контраста (А) и через 3 минуты (В)

it with the unchanged portion of the esophagus. However, he was unable to complete the operation in a single stage due to the limited length of the graft, which was positioned anterior to the transverse colon. Instead, the operation ended with a gastrostomy following the S. Travel's technique. It was not until 1911, after repeated attempts due to strictures and fistulas in the area of the esophagojejunal anastomosis, that it was possible to reconnect the intestinal segment to the esophagus at the neck. S. Roux presented this patient at a surgical conference in Paris in 1912.

In December 1907, P.A. Herzen, at the VII Congress of Surgeons in Saint Petersburg (Russia), reported on the successful creation of the first artificial esophagus using the small intestine. He pointed out the weaknesses in S. Roux's technique and modified it. The author placed the graft behind the colon using the gastrocolic ligament [7]. This technique allowed for a shorter path to the neck, avoiding additional crossing of vascular arcades and maintaining a reliable blood supply to the graft. However, the modification still did not resolve one main issue — the formation of a long enough segment of small intestine for immediate connection to the cervical part of the esophagus. Nearly every

operation resulted in partial or complete necrosis of the mobilized intestine and patients died from septic complications. The accumulated experience of jejunoesophagoplasty at that time, performed by the best surgeons in Europe, led to the conclusion that sub/total small intestinal plastic surgery was unreliable and unsafe [5].

In 1926, Professor V.N. Shamov presented a paper at the XVIII Congress of Russian Surgeons in Moscow. In his presentation, he proposed a revolutionary new approach to esophageal plastic surgery using the small intestine [8]. He wrapped a segment of the jejunum in skin and deserotized the intestinal wall. He then crossed the mesentery in several stages, interrupting the natural blood supply to the graft. The small intestine, wrapped in skin, was nourished by vessels that grew from the subcutaneous tissue. This method was successfully tested in two patients. Twenty years later, W.P. Longmire and M.M. Ravitch published an article in the "Annals of Surgery" describing their experience with small intestinal plastic surgery for the esophagus. They conducted experiments on 14 dogs and treated 3 patients. Their article accurately reproduced the ideas of V.N. Shamov, presenting them as their own invention.

In 1946, W.P. Longmire published another “new” proposal regarding jejunoesophagoplasty in the “Journal of Thoracic Surgery”. The proposal involved revascularization of a free jejunal graft from an intrathoracic artery [9]. However, in 1926, at the XVIII Congress of Russian Surgeons in Moscow, E.Yu. Kramarenko had proposed to mobilize a small intestinal graft according to the Roux — Herzen technique, not on one but on two vascular pedicles. One of these pedicles was to be used for arterial and venous anastomoses with vessels in the neck [10]. This proposal sparked the development of microvascular reconstructive surgery for the upper digestive tract in both Russia and abroad.

A century later, it can be stated that the methods of additional or complete revascularization of visceral transplants for the purposes of esophagoplasty have not received due development, and remain a subject of discussion today. Furthermore, the results presented in the literature are not satisfactory. S.H. Blackmon et al., after complete revascularization of a small intestinal graft using neck vessels, found that 32 % experienced esophagojejunal anastomosis failure due to ischemia, 8 % had graft necrosis, and 10 % died within 90 days from septic complications [11]. A.C. Mays et al. reported only 1 % small intestinal graft necrosis while noting 42 % other surgical complications such as fistulas, strictures, and cervical anastomotic leakages [12]. According to G.N. Gorbunov (2005), the incidence of necrosis of an artificial esophagus from the small intestine with blood supply from cervical or intrathoracic vessels is 10.6 %. We acknowledge that the proposed techniques for revascularizing visceral grafts have technical limitations, and the criteria for their use are not clearly defined [13]. A. Maier et al. (2002) suggest that over time, a freely revascularized section of the intestine, deprived of nerve supply, may completely lose its ability to contract and maintain normal patency [14].

The use of esophagoplasty with a small intestine on a vascular pedicle is very rare today [15]. This is due to the unfavorable angioarchitecture, which only allows 33 % of cases to form a graft of sufficient length [16]. In addition, the natural tortuous nature of the small intestine requires the resection of 1–3 extra loops to straighten the graft, which lengthens and complicates the procedure. Therefore, the main indication for jejunoesophagoplasty today is a lack of visceral reserve, such as the unsuitability of the stomach or colon [5, 17]. The experience of S.S. Yudin, who performed 318 esophageal plastic surgeries on the small intestine with a mortality rate of 9 % in 1954, remains the largest in the world and will likely never be surpassed [16]. It should also be noted that only 43.5 % of these surgeries were

successful. Yudin managed to successfully connect the graft to the cervical esophagus in two or three stages. For the remaining patients, he used a skin insert to complete the reconstruction between a short jejunal graft and the cervical esophagus.

Modern principles of esophageal reconstruction exclude the use of skin, myofascial flaps, and allogeneic materials in grafts. Additionally, any method of esophagoplasty should be a one-time and final intervention for each patient. A significant factor complicating reconstruction is combined damage to the esophagus and other organs of the digestive system, particularly the stomach, which prevents its use as a plastic material. Under these circumstances, an alternative approach to esophagoplasty with minimal negative consequences for the patient becomes necessary.

An original solution was proposed by Japanese scientists led by Professor M. Watanabe in 2014 [18]. After performing total esophageal excision to form a high pharyngeal anastomosis, the stomach was cut off from the duodenum and the antrum was resected. A gastric graft, formed in the shape of a tube, was passed through the neck using the right gastroepiploic vessels for nutrition. This technique, known as “duodenal transection”, gave mobility to the gastric conduit, allowing for a high anastomosis to be performed in an area with the most favorable blood supply and without tissue tension. The aboral (distal) end of the graft was then connected to the Roux-en-Y loop of the jejunum. In one case (2 %), a failure of the cervical anastomosis occurred, which was resolved conservatively within 38 days after surgery. A similar surgical technique had been previously used by M. Yamagishi in 1970, who performed 17 esophagoplasties for thoracic esophageal cancer with 2 (11.8 %) cases of early graft failure and no cases of graft necrosis [19].

Relocation of any visceral fragment for the purpose of esophagoplasty can cause damage to digestion and absorption of food. This can impair the digestibility of food [20]. An important goal of the reconstructive phase of esophageal surgery is to minimize these complications, as the frequency and severity of these complications serve as the main criteria for evaluating the success and effectiveness of the procedure. The main goal of the reconstructive stage of esophageal plastic surgery is to level these disorders. The frequency of these disorders serves as the main criterion for evaluating the effectiveness and physiology of the surgery. We consider including the duodenum in the passage of food to be a mandatory condition for esophagoplasty. This allows us to avoid severe digestive disorders in the long term. Implementing this principle is possible by interposing an isoperistaltic segment of the jejunum on a vascular pedicle between the short visceral graft and

the duodenum, according to the technique of jejuno-gastroplasty. This decision was not made randomly — today, at the NMRC, jejuno-gastroplasty is the standard choice for reconstructing the digestive system after proximal gastrectomy and gastric resection.

There are isolated reports in the literature on the use of an intestinal fragment on a natural source of blood supply in segmental esophagoplasty for diseases of the artificial esophagus. T. Randjelovic et al. (2007) reported on seven reconstructions of the cervical anastomosis after removal of the short (10 cm) segment of the jejunum using a long vascular pedicle [21]. No graft necrosis was observed, but dysphagia with aspiration syndrome was noted in 1 (14.3 %) patient in the long-term follow-up period. T.J. Watson et al. (1998) performed reconstruction with a segment of the jejunum on a vascular pedicle in 5 patients with an excessive loop of the colonic graft with impaired patency [22]. The authors removed the distal part of the colonic graft along with the proximal portion of the stomach and replaced the resulting gap with isoperistaltic jejunal graft. One patient (20 %) experienced failure of the gastrointestinal anastomosis.

The NMRC traditionally follows a standard algorithm for selecting plastic material for esophagoplasty: stomach, left half of the colon (including the transverse colon), small intestine, right half of the colon (excluding the cecum and ileum) [5]. The method of combined esophageal plastic surgery using a segment of the jejunum made it possible to revise the traditional algorithm. This approach allows for the use of “compromised” organs of the gastrointestinal tract to create an artificial esophagus, such as when a pathologically altered or previously operated stomach cannot be used for sub/total esophagoplasty due to its lack of sufficient length for the large curvature. However, with intact right gastroepiploic vessels, it is possible to create a combined graft of adequate length from a short gastric tube and a

jejunal segment on a vascular pedicle while preserving the colon as a backup. In the absence of a functional stomach and the unsuitable condition of the colon for a subtotal esophageal plasty, due to loose angioarchitecture or a history of resection, a short (35–40 cm) colon graft can be mobilized and moved to the neck. Reduodenization can then be performed using a jejunal tube, without running to subtotal jejuno-esophagoplasty. The interposition (movement) of a small intestinal fragment (20–25 cm) is not long-lasting during the digestive process, as it occurs under conditions of preserved sequential food passage. There is only a redistribution of absorption properties associated with the initial sections of the intestine, which does not significantly affect the degree of absorption and proportionate food intake. Additionally, the anatomical and functional characteristics of the small intestine, such as its tone, motor activity, and reflux of food, are taken into account.

We believe that the use of the jejunum segment for esophageal reconstruction is justified in certain situations, such as when there is a shortage of plastic material or in order to preserve the graft by limiting the distance between the short gastric graft and the duodenum. This solution is not intended for routine use but may be considered in complex and unusual cases. It is important to prioritize time-tested methods for creating visceral grafts that consider the individual characteristics of each patient.

Conclusions

The jejunal segment, created on a vascular pedicle for the purpose of esophageal replacement, serves as a functional connection between the short visceral graft and the duodenum, allowing for simultaneous reconstruction of this area, efficient use of plastic reserves for esophagoplasty, restoration of the normal passage, and prevention of bile reflux.

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