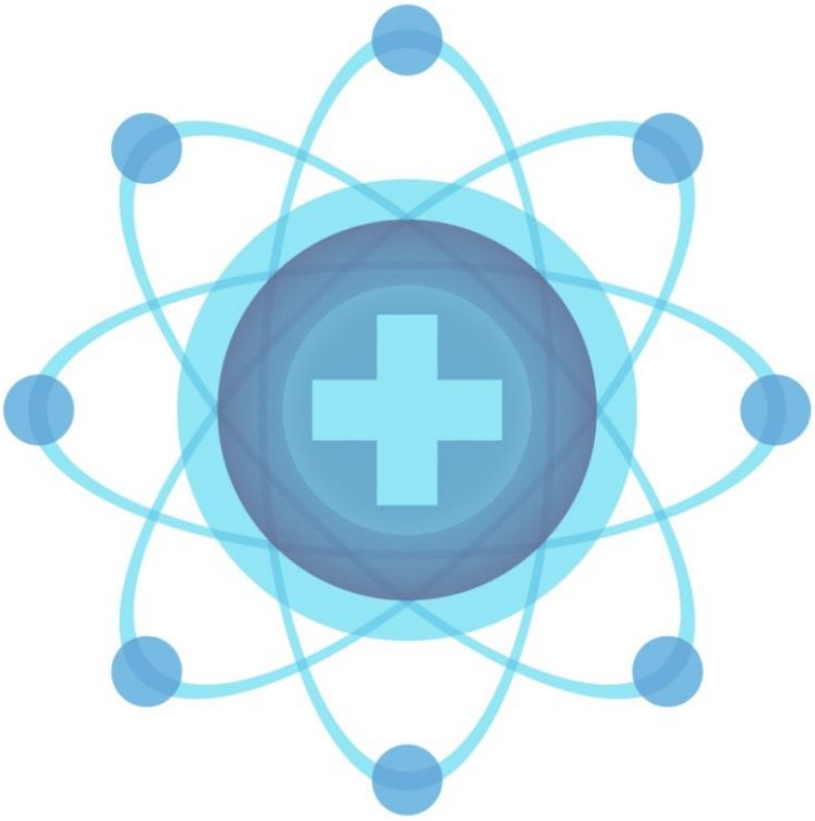


INTERNATIONAL MEDICAL SCIENTIFIC JOURNAL

ART OF MEDICINE

Volume-3
Issue-1

Founder and Publisher **North American Academic Publishing Platforms**
Internet address: http://artofmedicineimsj.us
E-mail: info@artofmedicineimsj.us
11931 Barlow Pl Philadelphia, PA 19116, USA +1 (929) 266-0862

Available at https://www.bookwire.com/
ISBN: 978-0-578-26510-0

OUR EXPERIENCE IN COMPLEX TREATMENT OF ESOPHAGUS PERFORATIONS

Ismailov S.I., Ligai R.E., Babajanov A.S., Khadjibaev J.A., Tsoi A.O.
The Republican specialized scientific and practical medical centre of surgery named after academician V.Vakhidov. Tashkent, Uzbekistan

Abstract. Recommendations for optimization of surgical and conservative treatment tactics of penetrating esophageal injuries are presented on the basis of own data of features of the clinical course of esophageal injuries depending on the age and etiology. The main factors of esophageal suture failure formation were the etiological factor of TP (p=0,031), duration of period between TP and surgery (p=0,047), severity of general condition (p=0,016), and presence of purulent-infectious complications during hospitalization ($0{,}002 \leq p \leq 0{,}026$).

Keywords: esophageal perforation, complex treatment, esophageal suture failure, surgical tactics.

Introduction

Esophageal perforation (EP) is an extremely rare but life-threatening medical emergency associated with a high incidence of fatal complications [3]. The incidence is extremely low - 3.1/1,000,000 per year [2]. The outcome of the treatment of esophageal perforation directly depends on the time since the injury [6]. In several studies, mortality ranges from 10% to 25% during the first 24 hours after perforation and increases to 40-60% if treated later [4]. Perforation of the esophagus can be of various etiologies. Often this is EP due to foreign bodies, more often organic, less often iatrogenic pathology and Boerhaave's syndrome [7, 9]

Because of its anatomy, esophageal perforation has a higher chance of occurring in four anatomical regions: 1) Killian's triangle (a muscle-free zone in the cervical esophagus); 2) intersection of the aortic arch; 3) junction with the left main bronchus; and 4) esophagogastric junction [1]. Diagnosis and treatment of esophageal perforations are critical. However, diagnostic errors are prevalent due to the presence of acute chest pain symptom, which often leads to misdiagnosis such as perforated ulcer, myocardial infarction, pulmonary embolism, aneurysm dissection, and pancreatitis [8]. The triad of vomiting, chest pain, and emphysema, known as the Mackler triad, should be used in the initial history taking. The extent of the defect, the location of the defect, and the time elapsed between the event and the start of therapy should be used in the decision-making process [5].

The effectiveness of EP treatment is due to the localization and isolation of EP, etiology, the duration of the period from receiving EP to the start of surgery, complications on admission, and the comorbid background of the patient [7]. Comorbidity is of great importance, since these pathologies affect both wound healing, the development of complications, and the body's response to medications, and hence the favorable outcome [9]. A significant role is also played by the duration of the period from receiving EP to the start of surgical intervention [2].

Conservative medical and manipulation methods of treatment make it possible to level small EPs up to several mm without the interest of surrounding tissues, which

are often of iatrogenic origin [3]. They are based on meticulous oral hygiene, the exclusion of oral intake of food or liquid, the appointment of broad-spectrum antibacterial drugs and nutrition through a nasogastric tube [4].

There are many treatment options and a multidisciplinary approach is needed [3]. The main question will be whether immediate surgical treatment is indicated or whether a less invasive conservative approach should be used [7]. Percutaneous drainage or endoscopic therapeutic procedures should be considered according to the clinical situation of the patient [5].

Aim of the study. To evaluate the effectiveness of tactics of complex treatment of patients with penetrating injuries of the esophagus by objective and subjective methods.

Materials and methods

The total random sample was 320 patients. In accordance with the specified criteria, the patients were divided into the following groups: comparison group (2005-2017) - 201 patients (62.8%) and the main group (2018-2022) - 119 patients (37.2%).

Among the studied patients, people of young working age (19-44 years) predominated, there were no gender differences among patients, the average age of our patients was 34.6±2.4 years, the average age of women was 36.1±2.8 years, men – 32.8±2.4 years (Fig. 1).

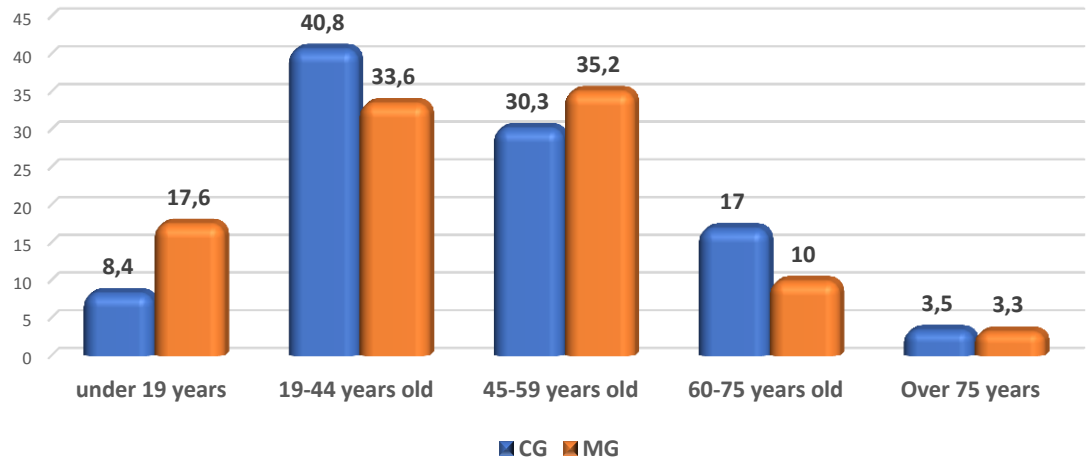


Fig. 1. Distribution of patients of the main group (MG) and comparison group (CG) by age, in %

In the diagnosis of PP, we used anamnestic, clinical, endoscopic, X-ray contrast research methods, esophagogastroduodenofibroscopy (EGDFS), the GSRS questionnaire (Gastrointestinal Symptom Rating Scale), the Clinical Global Impression (CGI) scale in order to objectify the evaluation of the patient's condition by a doctor before (CGI -s) and after (CGI-i) treatment, which completely satisfied us in the diagnosis.

Statistical processing of the results of this study was carried out by the methods of variation statistics in the Microsoft Office software package using the Excel-2019 program.

The localization of the injury also had an important influence on the technique and tactics of surgical interventions in EP, so when the injury of the esophagus (IE) was located in the thoracic region and there was no suppuration of the tissues of the esophageal wall, we performed suturing of the edges of the wound, after preliminary mobilization, the establishment of drainage and the introduction of a tampon into the lumen of the esophagus.

However, it should be noted that in all cases we carried out a thorough examination of the edges of the EP, if necessary, carried out scrupulous and thorough debridement and Primary surgical treatment of the edges of the wound, with a long time from receiving IE to hospitalization, there were cases of "cutting the sutures" and the inability to sutured the EP tightly, in these cases, we used the tactics of imposing drains and placing a tampon in the lumen of the esophagus.

Access to the esophagus in our study was carried out by left-sided colitomy, through the right pleural cavity, and for the lower third of the esophagus - transabdominal or left-sided thoracoscopic access, which is recommended by many researchers.

Drug therapy for patients with EP in both groups included: broad-spectrum antibiotic therapy, discontinuation of oral nutrition with the installation of a nasogastric tube, and metabolic therapy.

In the main group, we used laser therapy with the apparatus "Matrix" (LLC Scientific Research Center "Matrix", Russia, Registration certificate of the apparatus No. FSR 2007/00589 dated October 24, 2007) by irradiating the EP zone and the postoperative wound with defocused laser radiation at a wavelength of 365- 400 nm heads KL-VLOK-365-2 (UV spectrum) with a frequency of 80 Hz for 1 minute in order to accelerate wound healing, stimulating and bactericidal effect

Results

The most common complaint of the studied patients was chest pain - it was stated in all patients of both groups, 272 (85%) patients of both groups complained of general weakness, soft tissue emphysema - in 253 (79.06%) patients of both groups, vomiting (in including those with an admixture of blood) - in 210 (65.63%) patients, and all these complaints were distributed identically within the groups, almost in equal proportions. Complaints of nausea were in 214 (66.88%) patients, and in the comparison group (CG) - in 118 (58.71%), and in the main group (MG) - in 96 (80.67%), fever bodies were detected in 75 (45.31%) patients of both groups, and in the CG - in 30 (14.93%), and in the MG - in 45 (37.82%), which is most likely due to the etiological factor of EP in these patients (Fig. 2).

The most common comorbid diseases in the studied patients with EP were coronary heart disease (66 (20.63%) patients) and hypertension (62 (19.38%) patients).

In both groups, the most common cause of PP was foreign bodies - 45.31% of patients (in the CG - 89 (44.28%) and in the MG - 56 (47.06%) patients, respectively), the next most common etiological cause of PP was iatrogenic damage (38.81% and 33.61%, respectively, in groups). Injuries of the neck and chest caused EP in 42 (13.13%) patients, with chest injuries predominating in the CG (7.96%).

Spontaneous ruptures of the esophagus were found to be the rarest cause of EP in our study - 4.69% (3.48% and 6.72%, respectively, in groups) (Fig. 2).

We also studied the depth of penetration of the influencing factor of EP, so almost ¾ of foreign bodies and iatrogenic EP were penetrating in both groups.

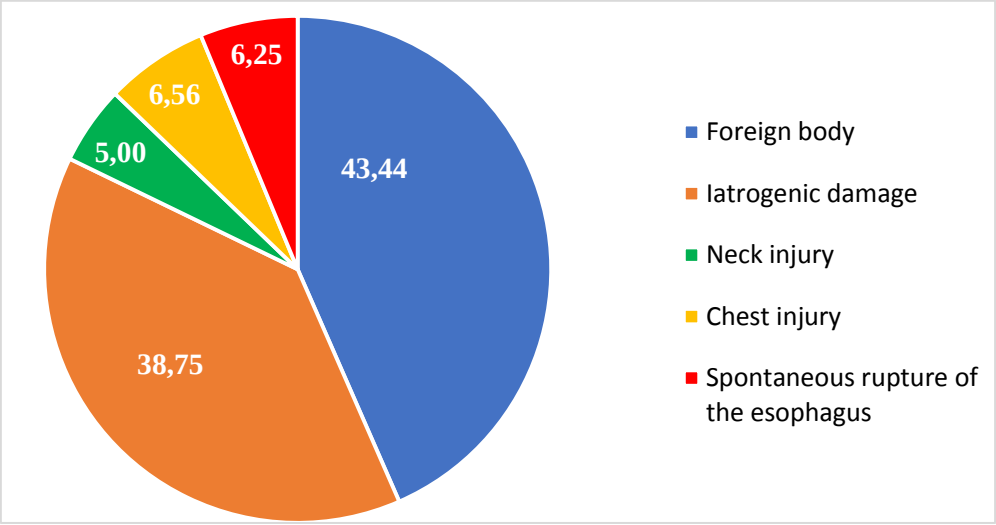


Fig. 2. Etiology of EP in the studied patients

The most common foreign bodies were meat bones - 38 (11.88%) patients and dentures - 31 (9.69%) patients, and the rarest were coins and buttons - 8 (2.5%), respectively.

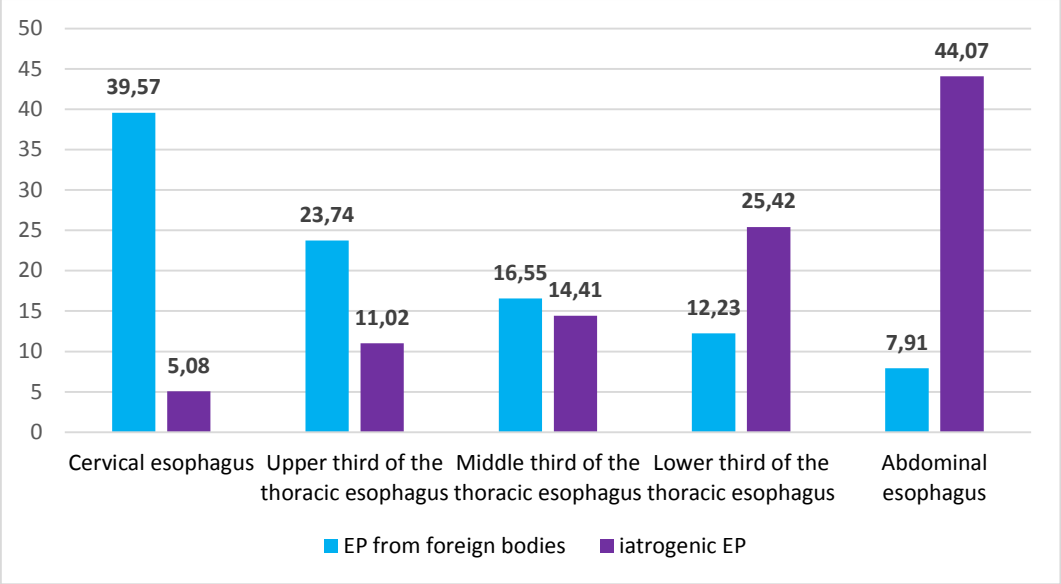
Most often, EP occurred on the left wall of the esophagus - 33.1%, the most rarely damaged wall in our study was the anterior wall - 18.62%.

The most common iatrogenic causes of EP were bougienage of the esophagus - 33.9%, and the rarest - intraoperative EP - 6.78%. It should be noted that most of the iatrogenic EPs (66.1%) were found in the CG, while only 33.9% of such EPs were recorded in the MG.

Most often, iatrogenic EP occurred on the right wall of the esophagus - 31.36%, in second place - the posterior wall - 22.88%, with almost the same frequency, EP was found on the left wall - 21.19%, and the most rarely damaged wall in our The study included the anterior wall - 9.32% and its angles with the left and right walls - 7.63% each. In an intragroup comparison in both groups, it is stated that it is completely identical to the overall picture of EP.

As in the case of iatrogenic EP, traumatic EP due to a neck injury prevailed in the CG - 61.11% versus 38.89% in the MG. The most common cause of neck injuries and PP caused by them was blunt neck trauma - 55.56%, and the rarest - a suicide attempt in the form of hanging - 5.56%, the difference between them is 1 order.

Among the traumatic EP of the cervical region, injuries of the anterior-left wall of the esophagus prevailed - 44.44%, the least common was complete dissection of the esophagus - 16.67%.



Rice. 3. The frequency of occurrence of EP in different departments depending on the etiology, %

The only cause of EP in chest injuries was penetrating chest wounds, which were noted in 24 (7.5%) patients, and in the CG there were 16 (66.66% of chest injuries), and in the MG - 8 (33, 34% of chest injuries), and relative to the groups of such patients in the CG was 7.96%, and in the MG - 6.72%, which did not have a significant difference.

Among spontaneous ruptures of the esophagus, ruptures of the lower third of the thoracic esophagus prevailed - 60%, 40% were found in the abdominal esophagus, most often affected the left wall of the esophagus - 46.67%, least often - the anterior-right wall of the esophagus - 6.67%.

It is noteworthy that absolutely the same appealability of patients with EP due to neck injuries in terms of up to 3 hours and 3-6 hours - 41.18% each. Among this category of patients, the opposite trend in the appealability of CG and MG was also stated, so 50% of patients applied to CG within up to 3 hours, 30% within 3-6 hours and 20% within 6-12 hours after a neck injury, and in Only 28.57% of MG applied within 3 hours, and patients who applied within 3-6 hours prevailed - 57.14%, 14.29% of patients were admitted within 6-12 hours.

The most common complication of EP of any etiology is esophagitis. Mediastinitis, as a very formidable complication of EP, was stated in our study in 27.5% of patients (29.35% in the CG and 24.37% in the MG, $p>0.05$), pleural empyema, damage to the trachea and bronchi and bronchitis was stated in approximately equal proportions (10-11% each), the rarest complication of EP was peritonitis - 1.88% of patients.

The presence of mediastinitis has a direct correlation with the duration of the period before hospitalization for foreign bodies and spontaneous ruptures of the esophagus ($r=0.58$ and $r=0.52$, respectively).

The mean VAS score for pain on admission in patients with EI who were admitted to the hospital was 6.48±1.23 points, with iatrogenic etiology of EP, the pain was on average 6.16±1.19 points, which is quite explainable by the number of injuries and conditions of the patient's stay.

In case of penetrating EP (158 people - 49.38% of all subjects), the surgical tactics depended on the esophagus, so in the cervical esophagus in CG patients, we performed a left-sided colitomy along the inner edge of the sternocleidomastoid muscle, the cervical esophagus was isolated and damage to its wall was visualized. With unchanged walls of the esophagus (with early diagnosis and hospitalization up to 24 hours after EP), the defect is sutured with a double-row atraumatic suture (Vicryl 3.0), drainage of the area of the sutured defect, and passage of a nasogastric tube into the stomach for nutrition. At the same time, feeding through the mouth is excluded, feeding of patients is carried out through a naso-gastric tube in a volume of 2.5-3.0 liters of liquid food. All patients were prescribed adequate antibiotic therapy with broad-spectrum drugs in recommended dosages.

On the 7th day from the moment of damage, an X-ray contrast study of the esophagus is performed using water-soluble contrast agents (trazograph, urographin, triambrast) to resolve the issue of the presence of contrast leakage outside the esophagus (which indicates a defect in its wall) or the formation of a "depot" of a contrast agent. In the absence of any deviations from the normal passage of contrast through the esophagus, the nasogastric tube is removed and the patient is transferred to physiological nutrition.

In the presence of suture failure in the early postoperative period, the cervical wound is opened and maintained in an open way, with a frequency of 2-3 dressings per day until the defect is completely closed. After that, an X-ray contrast study of the esophagus is performed using water-soluble contrast agents, and in the absence of any deviations from the normal passage of contrast through the esophagus, the nasogastric tube is removed and the patient is transferred to physiological nutrition.

In patients in whom more than 24 hours passed from the moment of EP to surgery, the esophageal walls were infiltrated with a tendency to eruption of sutures, in this case, the defect area is drained and tamponed without suturing the esophageal wall defect with its size up to 1 cm. The wound is carried out in an open way, with a frequency of 2-3 dressings per day until the defect is completely closed.

Such patients are also excluded from feeding through the mouth, feeding patients through a nasogastric tube in a volume of 2.5-3.0 liters of liquid food with the appointment of antibiotic therapy with broad-spectrum drugs in recommended dosages.

With extended defects in the cervical esophagus, its proximal esophagus is removed in the form of an esophagostomy in the upper third of the surgical wound with tightly sutured distal esophagus, drainage of the cervical wound and gastrostomy according to Stam-Sen-Kader.

Discussion

An analysis of the surgical tactics of CG patients with EP in the cervical region allowed us to identify errors that cause the development of complications in such patients - when patients were treated later than 24 hours after EP, by the time of hospitalization, neck phlegmon was formed (prevailing on either side, depending on the damage to a particular wall of the esophagus, the presence of neck phlegmon on the right, surgeons performed right-sided colitomy, which was a mistake, since the

anatomical and topographic features of the right cervical region, infiltration and swelling of tissues do not allow the surgeon to isolate the esophagus, which makes the defect of the esophagus invisible and inaccessible, and the attempt to isolate the esophagus accompanied by traumatization of tissues and greater seeding of the developed purulent process, and ends only with drainage of the cervical wound.

Another common mistake is to attempt to suture an esophageal defect during hospitalization of patients with EP more than 24 hours old, since the walls of the esophagus are already infiltrated and always show a tendency to eruption, which means that suturing of the esophagus is always associated with eruption and failure of the sutures, which will further increase the volume esophageal defect.

We came to the conclusion that it is necessary to perform exclusively left-sided colitomy, regardless of the side of the phlegmon of the neck and the wall of the PP, as well as in patients with EP more than 24 hours old, surgical tactics should not include suturing the esophageal defect, but only drainage into an open wound and feeding patients through naso-gastric tube.

In case of large and extended defects bordering on the complete detachment of the esophagus, an attempt to suture the defect is impractical due to the high risk of suture failure in the postoperative period, an additional left-sided colitis is performed with the oral end of the esophagus brought into the cervical wound in the form of an esophagostomy, and the distal esophagus is sutured tightly and a gastrostomy is performed according to Stam-Sen-Kader for subsequent enteral nutrition. In the postoperative period, abundant infusion, adequate antibacterial and post-syndromic therapy is carried out in accordance with the recommendations.

An analysis of the surgical tactics of CG patients with EP in the thoracic esophagus allowed us to identify errors that cause the development of complications in such patients - at a high risk of esophageal suture failure, surgeons did not dissociate the esophagus at the neck, as a result of which saliva continued to flow from the oral cavity to the sutured area of the esophagus , which increased the spread of infection and caused many complications in the postoperative period. Thoracotomy as such is a very traumatic approach and is accompanied by a more pronounced pain syndrome in comparison with colitis and laparotomy, which, in turn, in addition to the initial serious condition of the patient and the onset of complications, aggravates the course of the postoperative period.

A rigorous critical analysis of the results of the surgical tactics used in the CG allowed us to identify the above errors and correct them in the MG.

With the appearance of peristalsis of the gastrointestinal tract, given that when applying a gastrostomy, the anterior wall of the stomach is fixed to the anterior wall of the abdominal cavity, the propulsive ability of the stomach is disturbed. When feeding through a gastrostomy, food enters both in a natural way - into the duodenum, and into the esophagus due to antiperistalsis, which is highly undesirable if the sutures of the sutured defect of the esophagus are suspected, especially in the abdominal or lower thoracic esophagus.

In this regard, we have proposed a system for decompression of the stomach and enteral nutrition, which allows you to drain the stomach and conduct tube, enteral

feeding of the patient at the same time. The proposed system is a Pezzer catheter No. 36 and a gastric tube Fr 18 inserted inside the lumen.

Installation stages of the proposed "System for decompression and nutrition": after suturing the defect of the esophagus, sanitation and bringing drains to the suturing area, the esophagus is excluded from the digestion process by applying an external esophagostomy (to prevent saliva from entering the intervention area), then a gastrostomy is applied (for feeding) according to Stam-Sen-Kader.

Before installing the “cap” of the Pezzer catheter into the stomach cavity, the bottom of the cap is cut off to increase the throughput of the catheter. On the lateral surface of the proximal end of the Pezzer catheter, a hole with a diameter of 3-4 mm is cut, 3-4 cm away from the tip of the catheter. In the formed hole, through the lumen of the Pezzer catheter towards the cap, a gastric tube Fr 18 is passed to the level of the cap. After installing the Pezzer catheter with a probe inserted inside the stomach cavity, purse-string sutures are applied. Through the pararectal incision of the anterior abdominal wall, the proximal end of the catheter with the probe is brought out. The stomach is fixed to the anterior abdominal wall.

Further, under visual and tactile control, the gastric tube is pushed inside the lumen of the Pezzer catheter, stomach and duodenum 12 behind the ligament of Treitz to the jejunum. After sanitation, drainage, and, if necessary, packing of the abdominal cavity, the surgical wound is sutured. The Pezzera catheter is extended for passive drainage of the stomach, the gastric tube installed inside the catheter is closed with a regular plug.

In the postoperative period, after the restoration of intestinal motility, the stomach cavity continues to passively drain through the Pezzer catheter, and probe drip feeding is started through the gastric tube installed inside the lumen.

The advantage of the proposed system is the possibility of early enteral nutrition, the exclusion of the reverse reflux of the food mixture introduced into the jejunum through the stomach, as well as the constant drainage and decompression of the stomach. Entered volume of enteral feeding reaches 2.5-3.0 liters of liquid food per day by 4-5 days, which makes it possible to reduce intravenous infusions by the appropriate volume. After complete resolution of postoperative paresis and restoration of bowel function, when decompression of the stomach is no longer necessary, the gastric tube is completely removed and nutrition is carried out through the Pezzer catheter. Our analysis showed that in MG patients with penetrating EP (n=91), 50 (54.95%) patients had a smooth postoperative period and 41 (45.05%) patients developed complications. The statistical analysis performed showed that the number of patients without complications in the MG was significantly ($\chi 2=39.72$, $p<0.001$) more than in the CG.

The trend in the occurrence of the nature of complications with MG and CG is identical, so broncho-pulmonary complications predominate - in 73 (46.20%) patients with CG and 32 (35.16%) in MG, specific ones were noted somewhat less frequently - in 35 (22.15%) patients with CG and 11 (12.09%) patients in the MG, purulent-inflammatory - in 18 (18.35%) and 7 (7.69%), respectively, from the side of the cardiovascular system - in 16 (10.13%) and 6 (6.59%), other and thromboembolic - 9

(5.70%) patients in CG and 4 (4.40%) patients with MG, the rarest complications were bleeding - in 5 (3.16%) patients CG and 1 (1.10%) in the MG (Table 1).

Table 1

Comparative analysis of the nature of postoperative complications in the studied groups of patients

The nature of postoperative complications	CG (n=158)	MG (n=91)	Reliability
Specific	35 (22,15%)	11 (12,09%)	χ^2= 29.9, p<0.001
Broncho-pulmonary	73 (46,20%)	32 (35,16%)	χ^2= 22.72, p=0.001
Purulent-inflammatory	18 (18,35%)	7 (7,69%)	χ^2= 34.61, p<0.001
Thromboembolic	9 (5,70%)	4 (4,40%)	χ^2= 0.9454, p=0.330
Cardiovascular	16 (10,13%)	6 (6,59%)	χ^2= 7.221, p=0.007
Bleeding	5 (3,16%)	1 (1,10%)	χ^2= 4.578, p=0.032
Other complications	9 (5,70%)	4 (4,40%)	χ^2= 1.756, p=0.185

Statistical analysis showed that despite the fractional reduction in thromboembolic complications from 5.70% in the CG to 4.40% in the MG, bleeding from 3.16% in the CG to 1.10% in the MG, and other complications from 5.70% in the CG up to 4.40% in the MG, the reliability of the comparison was not obtained by us, however, the results were reliable for the main complications.

So if in the CG broncho-pulmonary complications developed in 46.20%, then in the MG their proportion significantly (χ2=22.72, p=0.001) decreased to 35.16%; the proportion of specific complications significantly (χ2=29.9, p<0.001) decreased from 22.15% to 12.09%; the proportion of purulent-inflammatory complications significantly (χ2=34.61, p<0.001) decreased from 18.35% to 7.69%, and the proportion of cardiovascular complications significantly (χ2=7.221, p=0.007) decreased from 10.13% to 6.59%.

Of the patients studied by us, the most frequently lethal outcome was EP due to foreign bodies - 20.25% in the CG and 14.28% in the MG, spontaneous rupture of the esophagus occupied the 2nd place - 3.16% and 2.20%, respectively, and the minimum mortality ascertained in iatrogenic pathology of the esophagus - 1.27% and 0% (Table 2).

Table 2.

Mortality of patients with penetrating EP by etiology and treatment groups

Etiological factor	CG (n=158)		MG (n=91)		Total	
	abs	%	abs	%	abs	%
Foreign body	32	20,25	13	14,28	45	18,07
Iatrogenic damage	2	1,27	0	0	2	0,80
Neck injury	1	0,63	1	1,10	2	0,80
Chest injury	4	2,53	2	2,20	6	2,41
Spontaneous rupture of the esophagus	5	3,16	2	2,20	7	2,81

TOTAL:	44	27,84	18	19,78	62	24,90

Note: proportions are calculated from the number of patients with penetrating EP in the group

In total, mortality was 44 (27.84%) patients in the CG and 18 (19.78%) in the MG, which we tend to associate with the competent selective management of our patients and the complexity of treatment in the MG. The lethal outcome occurred within 5 to 12 days after EI, on average - 7.34±1.12 days. all attempts (100%) to treat patients with EP who were admitted for periods of more than 24 hours ended in death, while as the time to hospitalization decreases, the proportion of deaths steadily decreases, reaching a minimum with a referral period of up to 3 hours - 2.27 % in CG and 0 in MG.

In the CG, the duration of the period between EP and the imposition of the primary suture averaged 14.62±3.84 hours, the minimum was 1 hour 45 minutes and the maximum was 55.9 hours. In the MG this time averaged 12.65±4.93 hours, the minimum was 1 hour 15 minutes and the maximum was 56.5 hours.

By multivariate correlation analysis using the Kolmagorov-Smirnov criterion, we stated the main causes of esophageal suture failure - late surgery, against the background of mediastinitis and pleural empyema, and the longer the period from EP to surgery, the higher the likelihood of suture failure, and the critical point in our The duration of the study was 20.53±5.46 hours ($p \leq 0.05$), the probability doubled at the critical point of 32.45±6.78 hours ($p \leq 0.001$), after which the probability of formation of suture failure reached 90% ($p \leq 0.05$).

The main factors in the formation of esophageal suture failure were: the etiological factor of EI ($p=0.031$), the duration of the period between EI and surgery ($p=0.047$), the severity of the general condition ($p=0.016$), and the presence of purulent-infectious complications during hospitalization ($0.002 \leq p \leq 0.026$).

It should be noted that the failure of the sutures of the esophagus was stated on average at 4.09 ± 0.87 days of the postoperative period, in the CG - 42 (20.9%) patients, in the MG - in 21 (17.65%) ($p \leq 0, 05$), which is most likely due to the use of laser therapy intraoperatively and in the postoperative period.

The causes of mortality in our study were complications of the postoperative period: purulent-septic (mediastinitis, pneumonia, pleural empyema, sepsis) - in 41 (93.18%) patients in CG and thromboembolism of the pulmonary arteries - in 3 (6.82%) patients, while in the MG these figures were 18 (81.82%) and 4 (18.18%), respectively.

According to VA scale, the pain significantly became less intense ($p \leq 0.05$), so the average level of pain in the CG at admission was 6.52±1.25 points, and in the MG - 6.44±1.18 points, at the time of discharge - 3.44±0.67 and 2.72±0.46 points, respectively.

Residual effects at the level of mild disorders were noted in 29.35% / 30.35% of CG patients (GSRS questionnaire / CGI-s scale) and 24.37% / 24.37% in MG, moderately severe disorders were found in 31.84 % / 30.85% in patients with CG and 26.89% / 26.05%, respectively, in MG, an identical trend was found for healthy patients and for borderline disorders ($p \leq 0.05$).

The average CGI-i score in the CG at the time of discharge was 2.37±0.12, while in the MG it was 1.92±0.14 points, the difference was statistically significant ($p \leq 0.001$).

Thus, we achieved a significant ($p \leq 0.05$) almost threefold prevalence in the MG of patients with a pronounced improvement in their condition and a general trend of shifting the results in this group towards complete recovery, which was traced in all subjective and objective studies, due to the correctly chosen surgical tactics. approach, the use of an integrated approach in postoperative treatment.

Conclusions

The duration of the period before hospitalization is of the greatest importance for patients with EP, especially with penetrating wounds of the esophagus, since this inevitably leads to the development of purulent pathologies of adjacent organs and cavities, depending on the localization of the EP, as the duration of the period from the moment of receiving PP to surgical intervention increases. lethality of patients.

Iatrogenic EP practically do not lead to lethal outcomes, with organic foreign bodies and spontaneous rupture of the esophagus - the maximum lethality. The localization of EP in the lower third of the esophagus is accompanied by a higher mortality in comparison with the thoracic and cervical regions.

The main factors in the formation of esophageal suture failure were: the etiological factor of EI ($p=0.031$), the duration of the period between EI and surgery ($p=0.047$), the severity of the general condition ($p=0.016$), and the presence of purulent-infectious complications during hospitalization ($0.002 \leq p \leq 0.026$).

The treatment in both groups of patients reduced the initial number of complications, however, it should be noted that the use of complex treatment in MG with intra- and postoperative use of laser therapy significantly increased the effectiveness of treatment. Thus, the indicators of mediastinitis and pleural empyema significantly differed - 21 (13.38%) and 13 (8.28%) patients, respectively, in the MG, 7 (7.22%) and 3 (3.09%), respectively, in the CG ($p \leq 0.05$). Esophagitis showed an identical trend - 33 (21.02%) and 14 (14.43%), respectively, in the MG and CG ($p \leq 0.05$).

Competent choice of tactics of surgical treatment, intra- and postoperative laser therapy with the Matrix device with irradiation of the EP zone and the postoperative wound with defocused laser radiation at a wavelength of 365-400 nm of the KL-VLOK-365-2 head at a frequency of 80 Hz for 1 minute daily, coupled with "The system for decompression and nutrition" will help reduce mortality and complications, a greater proportion of recovered patients with EP.

REFERENCES

1. García-Moreno V, Maiocchi K, Gómez-Quiles L, et al. Treatment of esophageal perforation: A review of our experience at a tertiary referral hospital spanning the past 19 years. Rev Gastroenterol Mex (Engl Ed). 2022;87(4):405-410. doi:10.1016/j.rgmxen.2021.11.014

2. Kuppusamy MK, Hubka M, Felisky CD, et al. Evolving management strategies in esophageal perforation: surgeons using nonoperative techniques to

improve outcomes. J Am Coll Surg. 2011;213(1):164-172. doi:10.1016/j.jamcollsurg.2011.01.059

3. Leers JM, Vivaldi C, Schäfer H, et al. Endoscopic therapy for esophageal perforation or anastomotic leak with a self-expandable metallic stent. Surg Endosc. 2009;23(10):2258-2262. doi:10.1007/s00464-008-0302-5

4. Kassem MM, Wallen JM. Esophageal Perforation And Tears. In: StatPearls. Treasure Island (FL): StatPearls Publishing; August 8, 2022.

5. El-Sourani N. Esophageal perforation: diagnosis, management and decision-making - a retrospective tertiary centre study. Turk J Surg. 2021;37(4):342-346. Published 2021 Dec 31. doi:10.47717/turkjsurg.2021.5289

6. von Renteln D, Denzer UW, Schachschal G, Anders M, Groth S, Rösch T. Endoscopic closure of GI fistulae by using an over-the-scope clip (with videos). Gastrointest Endosc. 2010;72(6):1289-1296. doi:10.1016/j.gie.2010.07.033

7. Rohatgi A, Papanikitas J, Sutcliffe R, Forshaw M, Mason R. The role of oesophageal diversion and exclusion in the management of oesophageal perforations. Int J Surg. 2009;7(2):142-144. doi:10.1016/j.ijsu.2008.12.042

8. Ryom P, Ravn JB, Penninga L, et al. Aetiology, treatment and mortality after oesophageal perforation in Denmark. Dan Med Bull. 2011;58(5):A4267.

9. Salminen P, Gullichsen R, Laine S. Use of self-expandable metal stents for the treatment of esophageal perforations and anastomotic leaks. Surg Endosc. 2019;23(7):1526-1530. doi:10.1007/s00464-009-0432-4

10. Deng Y, Hou L, Qin D, Huang T, Yuan T. Current treatment and outcome of esophageal perforation: A single-center experience and a pooled analysis. Medicine (Baltimore). 2021;100(16):e25600. doi:10.1097/MD.0000000000025600