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Transhiatal Esophagogastroplasty with Gastrostomy on the Neck

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ABSTRACT

Introduction: The formation of esophageal anastomosis with esophagogastroplasty is still associated with a high incidence of complications. The main cause of mortality after esophagogastroplasty is the failure of esophageal anastomosis.

Aim: The aim of the research was to improve results of esophagogastroplasty by prevention of postoperative complications.

Materials and methods: The research is based on the analysis of gastrostomy on the neck with esophagogastroplasty in patients who were treated during 2010-2017 years. The method of surgery which includes the extirpation of the esophagus with transhiatal esophagogastroplasty simultaneously with the formation of a single esophagogastronomy and contact gastrostomy on the left side of the neck.

Results: Intraoperatively nasogastral tube in patients who had got a partial failure of formed on the neck esophagogastronomy as postoperative complications was not removed and it was used for enteral feeding and limited a zone of the anastomotic failure till its closure. Mortality rate is 5% (acute cardiovascular insufficiency caused the death of 1 patient).

Conclusions: Developed and implemented in Clinic of the Institute method of a one-step transhiatal esophagogastroplasty with a single esophagogastronomy and contact gastrostomy on the left side of the neck in patients with extended postburn esophageal stricture in a condition of compensation and subcompensation can be considered as the treatment of choice.

Keywords: Esophagogastroplasty, Esophageal anastomosis.

INTRODUCTION

The esophagogastroplasty, the main stage of which is the formation of the esophageal anastomosis, is still associated with a high incidence of complications, despite the fact that the range of surgical, therapeutic and anesthetic provision has improved considerably in the recent time. The main cause of postoperative lethality after esophagogastroplasty is the failure of the esophageal anastomosis [1-5].

The emergence of the esophageal anastomosis stricture indicates unsuccessful surgical treatment, due to the fact that the patient with stenosis of the esophagus expects restoration of the adequate passage of food and, accordingly, adequate nutrition after the operation. And as a result of the anastomosis stricture, the patient loses these opportunities. Some authors point to the possible development of scar strictures in the period from 2 to 13 months after the surgery [1,6-8]. The rate of stricture development of the esophageal anastomosis is 9-30% [1,6-8].

According to a number of studies, in 50% of patients there was a dumping syndrome with a varying degree of severity [1-3], in 50% - complaints of reflux, in 46% - dysphagia were detected [1-3]. Even in the early postoperative period, the phenomenon of esophageal-respiratory reflux can disturb a patient due to the presence of the nasogastric tube. On the one hand, the need to retain the tube is necessary for unloading the line of anastomosis stitches, stomach decompression, providing the framework while forming anastomosis, and on the other hand, reflux of the gastric contents into the esophagus stump and from it into the airways can occur. This, in its turn, predetermines a number of postoperative problems: subjective discomfort of the patient due to the constant sense of irritation by the tube of the mucous membrane in the zone of its presence; dysphagia due to permanent incomplete functioning of the upper esophageal sphincter; inflammation of the upper respiratory tract, tracheobronchitis, pneumonia, pleurisy, etc. as a result of esophageal-respiratory reflux in post-operative patients.

Therefore, the issue of prevention of postoperative complications in patients with esophagogastroplasty remains open.

The aim of the study was to improve the results of treating the patients requiring esophagogastroplasty by preventing the development of postoperative complications.

MATERIALS AND METHODS

The analysis of the results of surgical treatment of extended post-burn scar strictures of the esophagus in patients who were treated in the 2010 - 2017 years in the department of the esophagus and the gastrointestinal tract diseases of the DU "IGUS V.T. Zaytsev NAMSU ". A surgical intervention technique was introduced into the surgical practice, which included extirpation of the esophagus with transhital one-stage esophagogastroplasty with the formation of a single gastroesophagostomy on the neck area and the withdrawal of contact gastrostomy on the neck to the left (Patent of Ukraine No. 106908 "A method for the prevention of esophagoplasty postoperative complications") [9].

Patients with severe and extremely severe general state and presence of cachexia were not taken into account in this study due to the need to compensate for the trophological status and the impossibility of reconstructive surgical intervention at this stage.

All the patients were examined according to the standard scheme which included: clinical and anamnestic research, basic clinical laboratory and biochemical parameters of blood, coagulogram, immunological parameters and special methods of research: electrocardiography, radiography of the chest cavity and X-ray examination of the upper gastrointestinal tract using contrast media, ultrasound diagnosis of the chest and abdominal organs, computed tomography of the chest and abdominal cavities using contrast media, video endoscopy with biopsy sampling and histomorphological studies. All patients at each of the stages of treatment were subject to an assessment of the effectiveness of treatment for examining the quality of life and further forecast and recommendations for the type of treatment according to the methodology developed by the clinic of the Institute (Patent of Ukraine No. 103176 " A method for evaluating the effectiveness of treatment for patients with gastroenterological diseases") [10-15].

When performing the work that has a prospective nature, statistical techniques of processing the results have been used.

RESEARCH RESULTS

We have analyzed the experience of treating 20 patients with extended post-burn scar strictures of the esophagus, who went through the above-mentioned reconstructive surgical intervention in the period from 2010 to 2017 inclusive at the age from 32 to 62 years old. The average age of patients was 37.6 years old. Distribution of the sufferers by the age was conducted according to the classification of the World Health Organization (1980): 18 - 35 years old- young people - 5 (25%) patients; 36 - 59 years old

– middle- aged 14 (70%); 60 - 75 years old – the elderly 1 (5%), 76 - 89 years old - aged (0%). There were 14 (70%) men, 6 (30%) women.

The main complaints of the patients, who got to the hospital, were dysphagia (100%), weight loss (96%), hypersalivation (36%), retrosternal pain (25%), regurgitation (4%). In predominantly all the patients there was a subcompensated degree of the esophagus obstruction with preserved dysphagia. There were no aged patients being examined for the research.

While analyzing the obtained data, a modified classification of chemical burns of the esophagus and their consequences was used, developed in the clinic of the Institute [16].

According to the data obtained, in the preoperative period of the main clinical and laboratory indicators and the above-mentioned methods of instrumental study, all the patients were sub-compensated and compensated, which allowed patients to undergo radical surgical intervention.

Taking into account the acting working age of patients, the length of the cicatrization process, which occupied two or more anatomical units of the esophagus, and the absence of concomitant severe chronic pathology in them, they underwent through a simultaneous reconstructive intervention, which included the formation of a free end of the esophageal tube, its withdrawal as a stoma onto the neck as well as the implementation of esophagoplasty (by imposing anastomosis between the esophagus and the interponate in the mould of “end-to-back” type) simultaneously with the formation of a stoma on the neck: a proximal part of the interponate above the level of anastomosis is selected as a free end of the esophageal tube, in addition a tube is placed into the interponate lumen outside the latter and fixed to the skin of the neck.

The execution of the stoma simultaneously with the main operation does not only relieve the traumatization of the patient, but also reduces the time of the intervention and inpatient stay in the clinic.

Applying anastomosis between the esophagus and the interponate in the mould of “end-to-back” type (the end of the esophagus to the side of the interponate) allows using the proximal part of the interponate above the level of anastomosis as a free end of the esophageal tube for the stoma exteriorization with the aim of the probe entering.

According to this technique, esophagus extirpation is carried out by transhiatal approach. The formation of an interponate begins with the mobilization of the stomach in such a way that the previous clipping of the left gastric artery, with the preservation of the gastro-articular artery, is performed, that provides a complete blood supply. Then, from the stomach paries an isoperistaltic tube

equidistantly to its greater curvature is formed, with the diameter proportional to the diameter of the esophagus (interponate), and the simultaneous formation of the reservoir according to the lesser curvature of the stomach, which in the future will directly carry out the role of both a transit and digestion of the food bolus. Next, the gastral interponate is transhiatally moved into the esophagus position with the withdrawal of its "free" end in the neck area access. The formation of a single esophagogastric anastomosis in the mould of "end-to-side" type with an anti-reflux mechanism is carried out. Transnasally outside the anastomosis zone a tube for decompression is entered into the stomach. After this, a contact gastrostomy with a tube insertion into the duodenum for enteral feeding is formed on left side of the neck (Figure 1).



Figure 1: Postoperative photo - contact gastrostomy on the neck (top-down: tube drainage, gastric tube, rubber tube drainage).

The insertion of the tube into the interponate lumen outside of the latter allows starting feeding the patient in the early postoperative period, to ensure the relief of the anastomosis stitches and even the evacuation of the contents of the digestive tract if necessary. All this reduces the probability of development of the anastomotic dehiscence. Also, the insertion of the tube through the contact stoma, rather than transnasally, can reduce the patient's discomfort and prevent the contents of the esophagus from entering the respiratory tract and the development of complications of the respiratory system as a result.

The execution of the contact stoma allows, upon completion of the need to retain the tube in the lumen of the digestive tract, to remove it without additional surgical intervention, meanwhile the closure of the stomach opening occurs independently. The final form of the surgical intervention is presented schematically in Figure 2.

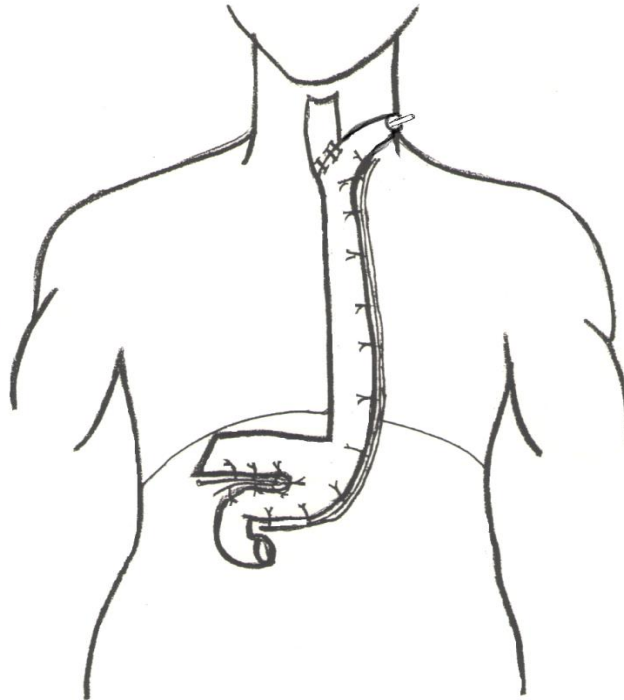


Figure 2: The final appearance of the surgical intervention – esophagogastroplasty with the neck gastrostomy

On the second - third day after the operation with the instance of peristalsis, the transnasal tube is removed, and through the tube, which has been introduced through the gastrostomy on the neck to the duodenum, enteral nutrition is carried out enabling the early revitalization of the patient and outweighing the "balance" of the parenteral nutrition into the enteral that can reduce financial costs.

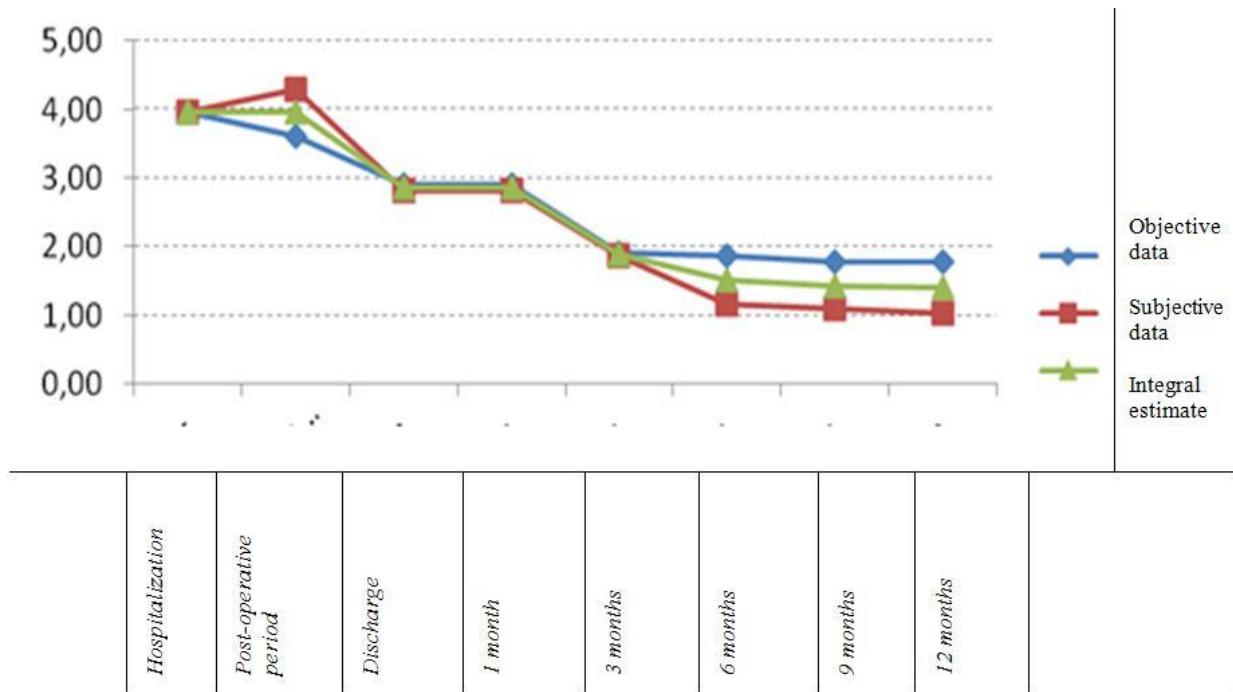
On the sixth - seventh day after the surgical intervention, a control X-ray examination of the upper gastrointestinal tract is performed using the water-soluble contrast agent per os to detect the possible failure of the formed anastomosis. In the absence of

the failure signs, patients are allowed to introduce into the food ration an intake of liquid in small portions in a natural way with a simultaneous support of the tube nutrition. And in the future there is a complete transition to eating naturally by removing the "gastrostomy" tube.

In 2 (20%) of the patients who, in the postoperative period, had complications in the form of a partial failure of the formed on the neck esophagogastronomy, the intraoperatively entered "gastrostomy" tube was not removed and further, in addition to the aforementioned function of enteral nutrition, also performed the function of separating the area of anastomotic failure until its closure. The given patient was regularly put a bandage on and sanitation measures of the failure zone with antiseptic solutions were taken. In this case, the closure of the zone of anastomotic failure occurred on the 10-14th day after its occurrence. These patients did not require additional surgical intervention.

The mortality rate is 5% (1 patient), who died due to the development of the acute cardiovascular insufficiency in the early postoperative period.

At all stages of treatment and post-operative rehabilitation, patients were subjected to an additional study to assess the quality of life and the effectiveness of treatment. The obtained results are presented in the graphic image (Figure 3).



□

Figure 3: Dynamics of the indicators of the quality of patients' life

It should be noted that in the early postoperative period there is an improvement in the objective data, while the weakened state of the patient and the inability of participation in public life significantly impair the outcome of the subjective data, therefore, in general, the integral estimate of quality of life is almost consistent with the indicator at the time of hospitalization. In the future, these graphs reflect the positive dynamics of quality of life in patients from the first month after the surgery.

DISCUSSION

Thus, one can distinguish the main advantages of this method of one-stage esophagogastroplasty:

1. Anatomical justification (the use of the stomach as an interponate allows to preserve the anatomical sequence of the gastrointestinal tract);
2. Lengthening of the interponate due to the formation of an isopyrastal tube along a large curvature of the stomach allows replicating the esophagus shape and placing it in the anatomical position of the esophagus, without tension, which prevents the interponate ischemia;
3. Preservation of sufficient blood flow of the gastric interponate by the aid of the gastroepiploic artery;
4. Restoration of the passage of food in a natural way;
5. Preservation of the stomach function, even when used as an interponate;
6. Imposing a single anastomoses on the neck, even with the development of its failure, does not foresee the development of such grave consequences as pleurisy, mediastinitis, pleural empyema, pneumonia, peritonitis, and others due to the absence of anastomoses in the abdominal and pleural cavities;
7. Absence of reflux of gastric contents into the cavity of the esophagus due to the formation of anti-reflux anastomosis;
8. The possibility of early enteral nutrition without affecting the anastomosis zone;
9. Closing the stoma opening does not require additional surgical intervention, it occurs on its own;
10. Reduction of the inpatient time of stay in the clinic;

11. No need for repeated hospitalizations;
12. Reduction of postoperative rehabilitation time;
13. Improving the quality of life of operated patients;
14. Reduction of financial expenses for patient's treatment.

CONCLUSION

Thus, the method of one-stage esophagogastroplasty with the use of transhital access and applying of a single anastomosis and the formation of gastrostomy on the neck in patients with post-burn extended scar strictures of the esophagus in the state of compensation and subcompensation, developed and put into practice in the clinic, can be considered as a treatment of choice.

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