



Modified Methods and Technical Techniques of Operations for “Difficult” Duodenal Ulcers

Botirov A.K.¹, Egamov S.Sh.²

¹ DSc, Professor, Andijan State Medical Institute, Uzbekistan

² Researcher, Andijan State Medical Institute, Uzbekistan

ARTICLE INFO

Published Online:
04 October 2022

Corresponding Author:

Botirov A.K.

ABSTRACT

In elective surgery of duodenal ulcers (DU), postoperative mortality reaches 4–6%, with perforation of the ulcer – 5–8%, with bleeding – 20–30%. At the same time, the leading cause of mortality is the failure of the duodenal stump, which occurs in 0.4–4.4% of patients, which significantly increases with gastric cancer due to “difficult” duodenal ulcers.

The authors have developed improved methods and techniques that ensure the safety of surgical intervention in case of “difficult” DU and facilitate its technical implementation. As a result, the authors reduced the incidence of postoperative complications associated with the technique of gastric surgery to 7.2% (in the control group – 19.3%), as well as mortality to 1.2% (in the control group 9.0%).

KEYWORDS: peptic ulcer of the duodenum, duodenal ulcer, duodenum, resection of the stomach, motor evacuation function of the stomach, “difficult” ulcers.

INTRODUCTION

Duodenal ulcer (DU) is one of the most common diseases of the gastrointestinal tract and remains an important socio-economic problem. In planned surgery for peptic ulcer (PU), postoperative mortality reaches 4–6%, with perforation of the ulcer – 5–8%, with bleeding – 20–30% [1–6]. At the same time, the leading cause of mortality is the failure of the duodenal stump, which occurs in 0.4–4.4% of patients, which significantly increases with gastric resection (GJ) for “difficult” duodenal ulcers (DU) [2, 3, 4].

A number of authors with “difficult” DU recommend performing RJ, however, they are overshadowed by a relatively high incidence of duodenal stump suture failure and mortality, which causes an urgent need for research in this direction [1, 5, 6, 7, 8].

Aim of the study. To improve the results of surgical treatment for PU with “difficult” DU by developing and implementing improved methods and techniques of operations.

MATERIAL AND METHODS

The subject of our study was 262 patients with DU with “difficult” DU, admitted to the 3rd surgical department of the ASMI clinic for the period from 2001 to 2020. Distribution of the studied category of patients into groups:

– control group – from 2001 to 2010 – 114 (43.5%) patients;

– the main group – from 2011 to 2020 – 148 (56.5%) patients.

A comprehensive study, both before and after surgery, included:

– fibroendoscopic examination;

– study of the motor evacuation function of the stomach (MEFS) using fluoroscopy, continuous electrogastrography and radiogastrography;

– study of the nature of gastric secretion by aspiration–titration method.

The results of special studies were processed by the method of variation statistics according to student using Microsoft Excel applications.

Results. When performing operations for “difficult” DU, there are difficulties with suturing the duodenal stump. This is where the threat of its failure lies. Quite numerous proposals for the prevention of failure of the duodenal stump in “difficult” DU, in our opinion, are incomparably more difficult than the imposition of a gastroduodenal anastomosis (GDA). At the same time, the application of GDA is possible only in the presence of 4–5 mm of the tissue of the posterior wall of the duodenum, even if this part of the wall is scar tissue.

The method and volume of gastric cancer were chosen

depending on the localization of the ulcer, the nature of the complications of PU, the topographic and anatomical conditions in the surgical area, the state of the motor evacuation and acid-producing functions of the stomach. In those cases when the duodenum is deformed by an ulcerative cicatricial and inflammatory process, has a sufficient diameter, after submucosal excision of the duodenum followed by extraduodenization, direct GDA was applied.

The formation of GDA in the Gaberer modification is the simplest in terms of technical execution and quite reliable and functionally advantageous among the modifications of the first Billroth method. If for some reason (cicatricial narrowing of the initial section – the bulb of the duodenum due to pyloroduodenal stenosis more than 3 cm long or a previously sutured perforated or bleeding ulcer, the risk of tension in the suture line of the GDA, etc.) it was not possible to impose a direct GDA, resorted to the formation termino-lateral transverse, less often longitudinal GDA. So resection of stomach (RS) in the modification of Gaberer-Finney and L.G. Khachiev in the above situations are indispensable, expanding the indications for anastomosis while maintaining the natural passage of food. The wider use of RS according to Billroth-I is associated not only with the desire to preserve the natural passage, but with the advantages of such an anastomosis, with difficulties in suturing the duodenal stump.

In our opinion, it is the implementation of RS with the use of several modifications of Billroth-I that can avoid the need for suturing the stump and thereby significantly reduce the occurrence of duodenal stump failure. However, in practical surgery, the use of the “traditional” variant of the formation of the stomach stump in 70 – 80% of cases does not allow anastomosis according to the first Billroth principle. Of these, the main disadvantage is that with the “traditional” gastric cancer, her stump significantly loses its reservoir capacity, which often leads to the forced formation of an anastomosis according to the Billroth-II principle. In this regard, the staff of our department has developed a number of methods and techniques of operations for gastric cancer, which also improved the results of surgical treatment for “difficult” DU.

The method of formation of the stump of the stomach “without pulps” during its resection.

The essence of the invention. We begin the mobilization of the stomach with a large curvature, leaving 2/3 for the future stump. Mobilization is carried out strictly parietal with the intersection of only the terminal lateral branches of the right gastroepiploic artery, thereby maintaining the integrity of the main trunk. From the side of the greater curvature, we apply a clamp only on the removed part of the stomach perpendicular to the axis of the stomach with a length of up to 5–6 cm, i.e. 2 times more than the lumen of the future anastomosis.

From the side of the lesser curvature of the stomach,

2–4 cm away from the cardia, we perform ligation and intersection of the descending branch of the left gastric artery. Then, only from the side of the omental bag, a clamp is applied, capturing it together with the vessels and vagus nerves, over which we gradually excise the lesser curvature of the stomach (90% of the parietal cells that produce hydrochloric acid are located on the lesser curvature) and apply interrupted sutures with vicryl to the tip of the instrument applied from the greater curvature of the stomach. Peritonization of the lesser curvature is performed with “P” – shaped nylon sutures.

Further, from the side of the greater curvature, we apply a clamp only on the part of the stomach to be removed perpendicular to its axis with a length of up to 5–6 cm and dissect the serous membrane with the imposition of muco-submucosal muscular “corrugated” single-row sutures with vicryl. As a result, the diameter of the opening of the gastric stump decreases from 6–7 cm to 3.0 cm, which will correspond to the diameter of the initial part of the duodenum. Then we respect the distal part of the stomach with a part of the lesser omentum.

Before closing the anterior lip of the anastomosis, be sure to leave a decompression probe. After that, we check the reliability of hemostasis of the “keel” of the stomach stump with a napkin.

In the future, we mobilize the distal part of the stomach to be removed with the intersection of the right gastric artery.

With this method: 1) the technique of the operation is simplified, squeezing of the tissues of the stomach stump is excluded; 2) the integrity of the trunks of the gastroepiploic arteries is preserved, which makes it possible to ensure a full blood supply to the stomach stump; 3) by excision of the lesser curvature of the stomach with a significant part of the lesser omentum, the zone of the main localization of the parietal cells producing hydrochloric acid is removed – up to 90%; 4) a significant part of the stomach is preserved from the side of the greater curvature, providing its reservoir function; 5) the imposition of “corrugated” muco-muscular submucosal sutures provides reliable hemostasis and promotes additional mechanical retention of food, which allows you to adapt the diameter of the stump opening to the diameter of the initial part of the intestine and expands the indications for anastomosis according to the Billroth-I principle.

In the future, the distal part of the stomach is mobilized, to be removed with the intersection of the right gastric artery.

Then, the first row of silk sutures is preliminarily applied to the back wall of the initial part of the duodenum. When suturing the posterior lip of the anastomosis, the needle should be inserted 0.8–1.0 cm from the edge of the stomach, and in the duodenum, the needle should be inserted and punctured up to 0.5–0.6 cm from the edge of the intestine. In

this case, the distance between the sutures in the stomach should be 0.6–0.8 cm, and in the duodenum 0.5–0.6 cm. 4–5. This forms the posterior lip of the anastomosis. Before closing the anterior lip of the anastomosis, be sure to leave a decompression probe. Then we form the anterior lip of the anastomosis.

Before suturing the anterior lip of the anastomosis on both sides, it is necessary to apply “P” – shaped sutures – “locks” with the base inside the anastomosis. Since they technically facilitate the comparison of the stitched edges and withstand the main load that comes to the anastomosis area in the early postoperative period, which is also one of the measures to prevent the failure of their sutures.

The anterior lip of the anastomosis is sutured with single-row, screw-in sutures with the capture of the serous-muscular-submucosal layer, starting from the side of the lesser curvature. The injection starts at a distance of 0.5–0.6 cm from the edge of the stump of the stomach and duodenum, and the injection starts at a distance of 0.2 cm. The distance between the sutures should be 0.8 cm, the number should be 4–5. The examined row of serous-muscular sutures is placed in the gap between the first row of sutures. When suturing the anterior lip of the anastomosis, the nodes should be located on the anterior wall of the stomach stump, because its wall is stronger than the duodenum. This further increases the strength of the anastomosis.

It should be noted that when separating the distal part of the stomach to be removed from the duodenum, a crushing clamp is applied 0.5–1.0 cm above the border of the intestine. On the duodenum from the lateral edges, sutures-holders are preliminarily applied. At the same time, it is advisable to start the separation of the stomach from the duodenum from the side of its posterior wall. To prevent contamination due to the expiration of the contents of the duodenum, before dissection of the anterior wall of the intestine through the hole formed in the posterior wall, it is necessary to introduce a gauze napkin.

Through the nasogastroduodenal polyvinyl chloride probe, after the formation of the anastomosis at the operating table, we begin gastric lavage to “clean” waters. In the postoperative period, a constant decompression of the stomach is performed.

As a result of this: there was no stretching of the stomach stump, vomiting, belching, regurgitation and hiccups; favorable conditions were created for the healing of anastomoses and duodenal stump; inflammation in the stomach stump and anastomosis was prevented, as decomposing organic substances (blood, mucus, sputum) were actively removed; paresis of the stump of the stomach and intestines was prevented, since substances did not enter the intestines, during the decomposition of which enzymes and toxins arise; reduced terms of bed rest.

We must remember the circumstances that do not allow the implementation of the RS in Billroth–I. This is the

presence of duodenostasis, postbulbar ulcers, duodenal stenosis for 3–5 cm in combination with giant and penetrating duodenal ulcers. In these cases, RS is performed according to Billroth–II.

In case of gastric cancer according to the second Billroth principle, we have developed and implemented a method for suturing the duodenal stump during gastric resection.

Suturing the duodenal stump and the surgeon’s desire to completely excise the “hard-to-remove” ulcer is often fraught with the development of postoperative pancreatitis with activation of gastric juice and the development of suture failure of the duodenal stump with high mortality.

THE ESSENCE OF THE INVENTION

With “difficult” DU, before suturing her stump, only submucosal excision of the edges of the ulcer to its bottom is performed, then the edges of the tissues were compared with muco-submucosal muscle single-row interrupted sutures, i.e. the bottom of the ulcer was removed from the digestive tract. The bottom of the ulcer, directly adjacent to adjacent organs, was not separated from them. Mucosectomy somewhat complicated the operation technique, but made it possible to prevent trauma to the pancreas and bile ducts, with the ensuing consequences. Extraduodenization made it possible to eliminate the ulcer as a source of pain impulses and subsequent complications.

The next step, to cover the stump of the duodenum, two semi-purse-string sutures are applied. At the same time, the injection of the needle should be 0.1–0.2 cm away from the edge of the duodenal wall, and the injection at a distance of 0.5–0.7 cm from the edge of the intestinal wall. This allows you to screw the wall of the duodenum inside along with its mucosa. The distance between the injection and injection of the needle when tightening the sutures should also correspond to 0.5–0.7 cm. This ensures the reliability of the sutures of the duodenal stump. Overlay serous-muscularly submucosal interrupted sutures. The operation is completed by bringing a decompression probe to the stump.

With this method: by excising the edges of the ulcer to its bottom and applying marginal sutures, extraduodenization of the ulcer was achieved, which excluded the presence of an ulcer in the duodenal stump as a source of subsequent complications – pain, bleeding; injury to the head of the pancreas and bile ducts is prevented, which is the prevention of insolvency of the sutures of the duodenal stump and bile fistulas; suturing the duodenal stump in this way, leaving a decompression probe in its lumen, is technically easier to perform, and is also a reliable prevention of suture failure and mortality.

CONCLUSION

The improved methods and techniques developed by us ensured the safety of surgical intervention in case of

“difficult” DU and facilitated its technical implementation. As a result, the frequency of postoperative complications associated with the technique of gastric surgery decreased to 7.2 % (in the control group – 19.3 %), as well as mortality to 1.2% (in the control group 9.0%).

REFERENCES

1. Ageev A.F., Ageev M.A., Davletshin A.Kh. Duodenal stump. Kazan, Ekaterinburg, 2004, – p. 84.
2. Vlasov A.P., Saraev V.V., Katkov S.V. Comprehensive approach to the treatment of “difficult” duodenal ulcers. Medical almanac. 2012. No. 2 (21). – p. 153–156.
3. Zaitsev O.V., Tarasenko S.V., Natalsky A.A., Morozov K.S. Technical aspects of performing gastric resection in conditions of difficult duodenal ulcer // Pacific Medical Journal, No. 3, 2011. – p. 75–79.
4. Kadirov D.M., Kodirov F.D., Kurbonov D.M., Kobilov Kh.Sh. Surgical treatment of postbulbar ulcers complicated by stenosis // Surgery. Journal them. N.I. Pirogov. No 5, 2010. – p. 42–46.
5. Sinichenko G.N. The method of covering the “difficult” stump of the duodenum during resection of the stomach // Surgery. No 11, 2005. – p. 37–41.
6. Nikitin V.N., Klipach S.G. “Difficult” stump with complicated giant penetrating pyloroduodenal ulcers // News of Surgery. Volume 25, Number 6, 2017. – p. 574–582.
7. Tsukanov Yu.T., Nikitin V.N., Nikolajchuk A.I. Method of forming stump duodenal ulcer in a giant circular complicated ulcer. RF patent. 2012.
8. Ducur A., Blidaru P., Kicscu S., Georgescu A., Manea G., Stanescu R., Spataru A. The complicated postbulbar ulcer (CPBU) // Chirurgia (Bucur). 1996. – p. 36–38.