

Method of Pylorus-Preserving Duodenoplasty in Surgery of Perforated Duodenal Ulcers

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Abstract:

According to the World Health Organization, duodenal ulcer disease (DU) affects 10-15% of the world's population. Perforated duodenal ulcer (PDU) to this day continues to occupy a leading place in the structure of frequency (10-20%) and mortality (2.0-20%). At the same time, the results of surgical treatment are not completely satisfactory. Despite two centuries of experience in the treatment of DU, including its complications of perforation, it has made it possible to test and use all surgical interventions known in gastric surgery. At the same time, in many clinics the main emergency operation remains suturing, performed in 45-80% of patients. However, this surgical intervention is palliative and in 34-85% of cases requires reoperation.

Introduction

In world practice, the most relevant research currently remains the study of modifiable and non-modifiable factor characteristics, including potential pathogenetic mechanisms that contribute to the formation of pyloroduodenal ulcers and associated complications. The mortality rate of patients with perforated duodenal ulcers remains high and, according to various authors, ranges from 1.3 to 20% or more. It is worth noting that, although perforation is less common than bleeding, mortality is higher with perforated ulcers, which account for about a third of deaths in complicated ulcers.

The high relevance of the development of new highly effective methods of pyloroplasty in patients with perforated duodenal ulcers is indicated by the appearance in recent years of a number of publications that propose new options for the technical performance of operations. For example, V.R. Nikitin et al.

A very promising direction of research seems to be related to the development of pyloroplasty methods while maintaining the integrity of the pyloric sphincter. The introduction of such operations seems anatomically and functionally justified, taking into account the enormous role of the pyloric sphincter for the physiology of digestion in the gastroduodenal zone.

Aim of the Study

Improving the results of surgical treatment of perforated duodenal ulcers by improving the diagnostic and treatment algorithm.

Materials and Methods

Over the past 20 years (2001-2020), 782 patients with duodenal ulcer (DU) complicated by perforation were subject to surgical treatment at the Department of Surgical Diseases and Urology. Of these, 229 (29.3%) patients underwent suturing of the perforated PDU, and 74 (9.4%) underwent gastric resection (RG). Including, 98 (12.5%) patients were operated on by excision of the PDU with gastric drainage operations (GDO) such as pyloroduodenoplasty (PD) according to Judd-Tanaka, Heinecke-Mikulich and Finney, and excision of the PDU with duodenoplasty (DP) while maintaining the integrity of the sphincter pylorus (SP) -381 (48.7%) patients.

As can be seen from Figure 1, the largest contingent of patients with PJA were persons aged 19-44 years - 336 (70.1%) and those aged 45-59 years - 63 (13.2%). These data indicate that the main contingent consists of people of active and working age, which undoubtedly has a certain economic significance for this problem. It is noteworthy that under the age of 19, PJD was diagnosed in 62 (12.9%) and in 18 (3.7%) in old age, which determines not only the medical, but also the social significance of this problem. The distribution of patients with PJD by age is presented in Figure 1.

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In this case, the main contingent of patients were males. Thus, among the studied patients, men accounted for 452 (94.4%), and female patients only 27 (5.6%), which is presented in Figure 2.

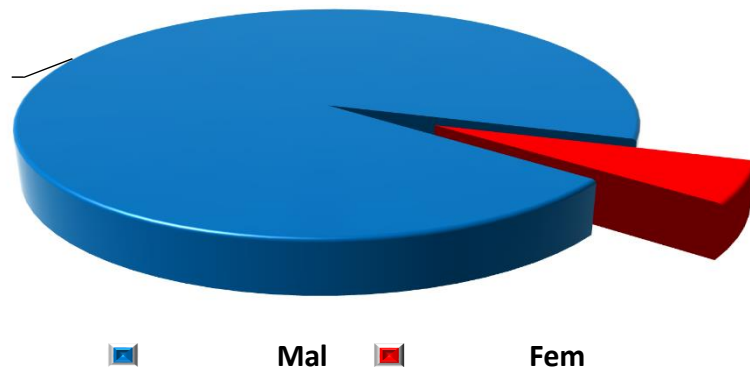


Fig.2. Distribution of study patients by gender

In our patients, the main clinical symptoms of the disease with PJA are presented in Table 1.

Table 1. Clinical symptoms of the disease with perforated DU

Clinical manifestations	abs	%
Prodromal pain	176	36,7
"Dagger" pain	442	92,3
Muscle tension	359	92,9
Shchetkin-Blumberg symptom	445	97,1
Ulcerative history	408	85,2
"Silent" ulcers	71	14,8

In patients with PJD, the timing from the moment of perforation to admission to the hospital plays an important role in the choice of surgical method and treatment outcomes.

The distribution of patients depending on the timing of perforation before admission to the hospital is presented in Table 2.

Table 2 Distribution of patients depending on the timing of perforation at the time of admission to the hospital

Deadlines (in hours)	Quantity	
	abs	%
until 6	274	57,2
r	<0.05	
From 6 to 12	102	21,3
From 12 to 24	61	12,7
r	<0.05	
More than 24	42	8,8
Total	479	100

The data presented indicate that the main contingent of patients with PJD were admitted to the surgery department in the first 12 hours from the moment of perforation, that is, there were quite favorable conditions for performing these surgical interventions.

Localization of the PDJ on the anterior wall of the duodenum was established in 286 (59.7%) patients, along the anterolateral wall of the duodenum along its greater curvature in 68 (14.2%), along the anteromedial wall of the duodenum along its lesser curvature in 54 (11.3%). In 43 (9.0%) patients, perforation of the DU of postbulbar localization was established. In addition, in 28 (5.8%) patients, the DU partially covered the pyloric sphincter (SP). It should be noted that perforation of the ulcer of the posterior wall of the duodenum was not detected in our observations, although there were also “mirror” ulcers.

The distribution of study patients depending on the diameter of the perforation is presented in Table 3.

Table 3 The diameter of the perforation in the studied patients

Perforation diameter holes (in cm)	Number of cases	%
up to 0.5	193	40,3
0,5-0,9	268	55,9
more than 1.0	18	3,8
Total:	479	100

Results and Discussion

All patients underwent excision of the DU, but pyloroplasty and duodenoplasty after excision of the DU were performed in various modifications. As is known, JO not only

improves EFF, but also helps reduce contact of food with the mucous membrane of the antrum, which leads to a decrease in the gastrin mechanism. In the initial period of our work, when excising duodenal ulcers, we used pyloroduodenoplasty according to Finney, Heineke-Mikulich and Judd-Tanaka.

The nature of the surgical interventions we performed for perforated DUs is presented in Table 4.

Table 4. The nature of surgical interventions performed for perforated DU

Operation name – excision of PDJ with:	Number of patients		Statistics differences in t
	abs	%	
- RAP according to Judd-Tanaka	64	13,4	P<0,05
- RAP according to Heineke-Mikulich	14	2,9	P>0,05
- RAP according to Finney	20	4,2	P>0,05
- duodenoplasty (DP)	387	79,5	P<0,001
Total	479	100	

As can be seen from the table below, during pyloroduodenoplasty according to Heineke-Mikulich - 14 (2.9%) used a longitudinal incision along the axis of the stomach and duodenum, i.e. A wide pyloroduodenotomy was performed. The wound was sutured with a double-row suture after excision of the perforated ulcer. In this type of gastric drainage operation, the integrity of the pyloric sphincter is completely disrupted, which is often the cause of GHD, dumping syndrome and other disorders of the MEF.

In recent years, during operations for PD, we have widely used an improved method for excision of PD with DP (Patent No. 2262 PV RUz)

Functional dysfunctions of the MEF are the most common complication of AOM in the early postoperative period.

We conditionally divided MEF disorders in the form of anastomositis and gastroplegia into mild, moderate and severe disorders (Table 5).

Table 5. Early functional disorders of the MEF

Type of plastic surgery according to:	Severity of violation			Total	Difference statistics by t test (P)
	Light	Average	Heavy		
JO n=98	-	6 (6,1%)	5 (5,1%)	11(11,2%)	P _{2,3} <0,01 P ₃ <0,001
DP n=381	12 (3,1%)	6 (1,6%)	-	18(4,7%)	P ₁ <0,001 P ₂ >0,01
Total n=388	12 (2,5%)	12 (2,5%)	5 (1,1%)	29(6,1%)	

Functional MEF disorders occurred in 29 (6.1%) patients (11 (11.2%) in the control group, 18 (4.7%) in the study group).

The main method for diagnosing GHD was FGDS. GHD was diagnosed in the control group in 16 (16.3%) cases, and in the main group - only in 11 (2.9%). Moreover, its manifestations in the control group were more pronounced, which was evident in the clinical picture, and was predetermined by a violation of the integrity of the pyloric

sphincter. Whereas in the study group, patients did not show any special complaints, and the presence of GHD was diagnosed during a control endoscopic examination.

Thus, GHD and dumping syndrome, being pathognomic manifestations of pylorus-destroying operations, are quite common and common complications, where the trigger is a violation of the integrity of the pyloric sphincter. As a result, GHD and dumping syndrome not only have a detrimental effect on the course of the disease, but also largely determine the quality of surgical treatment.

Excellent and good results in the control group were established in 53 (64.4%) cases, in the main group - in 272 (87.7%) cases. This indicates the greater effectiveness of duodenoplasty compared with JO, which destroys the integrity of the pyloric sphincter.

Conclusion

As we accumulate clinical experience, we have clarified the contraindications to this technique of pylorus-preserving DP, which has improved the results of surgical treatment.

Optimization of surgical tactics, along with methods and techniques for excision of the PD with pylorus-preserving DP, made it possible to improve excellent and good results by 23.1% (in the control group - 64.4%, in the main group - 87.7%), reduce the frequency of satisfactory results by 16.0% (in the control group - 24.4%, in the main group - 8.4%) and unsatisfactory - by 7.1% (in the control group - 11.0%, in the main group - 3.9%)

Thus, our studies have established that the results of excision of the PDU with a pylorus-preserving DP are significantly better than excision of the PDU with a PDP, accompanied by a violation of the integrity of the pyloric sphincter.

References

1. Abdullajanov B.R., Botirov Zh.A., Kurbonova S.L. Surgical treatment of perforated duodenal ulcers //Archivarius. 2017. No. 1(16). pp. 21-25.
2. Akimov, V.P. Diagnosis and therapeutic tactics for perforated ulcers of the stomach and duodenum / V.P. Akimov et al. //In: Diagnostic and therapeutic tactics for acute surgical diseases of the abdomen and chest. – 2018. – P. 160-187.
3. Ataliev A.E. Surgical treatment of perforated gastroduodenal ulcers // - M.: UzSSR, Tashkent. 1972. -114 p.
4. Afendulov S.A. Treatment of perforated ulcers / S.A. Afendulov, G.Yu. Zhuravlev, H.A. Krasnolutsky. M.: FSUE IPC FINOPOL, 2005. - 166 p.
5. Beburishvili, A.G. Perforated cholecystitis. Classification and Atypical clinical forms / A.G. Beburishvili, S.I. Panin, E.N. Zyubina //Surgery. – 2018. – No. 1. – P. 10-13.
6. Gostishchev, V.K. Radical surgical interventions in the treatment of patients with perforated gastroduodenal ulcers / V.K. Gostishchev, M.A. Evseev, R.A. Golovin // Surgery. - 2009. - No. 3. - P. 10–16.

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7. Ivashkin, V.T. Diagnosis and treatment of peptic ulcer in adults (Clinical recommendations of the Russian Gastroenterological Association, Russian Society of Colorectal Surgeons and Russian Endoscopic Society) / V.T. Ivashkin, I.V. Maev, P.V. Tsarkov et al. // Russian Journal of Gastroenterology, Hepatology, Coloproctology. 2020. – T. 30(1). – pp. 49–70.
 8. Nazyrov F.G., Nishanov M.F. Rationale for gastroduodenoanastomosis with economical gastrectomy in surgery for duodenal ulcer //Emergency Medicine. 2014. No. 1 (56). – P. 37-40.
 9. Nishanov F.N., Nishanov M.F., Khozhimetov D.Sh., Robbidinov B.S. The choice of tactics for the treatment of gastric and duodenal ulcers complicated by perforation // “Sport and Medicine” - No. 3-4 2019. P.-92-95.
 10. Khadzhibaev A.M. A new method of gastric resection with modeling the function of the pyloric sphincter // Bulletin of emergency medicine. 2020. No. 1-2. – P. 101-106.
 11. Ansari D, Torén W, Lindberg S, Pyrhönen HS, Andersson R. Diagnosis and management of duodenal perforations: a narrative review. Scand J Gastroenterol. 2019;54(8):939-944.
 12. Bertleff M.J. et al. Randomized clinical trial of laparoscopic versus open repair of the perforated peptic ulcer: the LAMA Trial. World J Surg 2009; 33: 7: 1368—1373.
 13. Konishi T, Fujiogi M, Michihata N, Kumazawa R, Matsui H, Fushimi K, Tanabe M, Seto Y, Yasunaga H. Outcomes of Nonoperative Treatment for Gastroduodenal Ulcer Perforation: a Nationwide Study of 14,918 Inpatients in Japan. J Gastrointest Surg. 2021 Apr 6.
 14. Nazirov F.G., Nishanov M.F., Nishonov F.N., Bozorov N.I., Khojimetov D.Sh. Modern aspects of surgical treatment of pyloroduodenal ulcers