Modern American Journal of Medical and Health Sciences
ISSN (E): 3067-803X
Volume 01, Issue 06, September, 2025
Website: usajournals.org

IMPROVEMENT OF LASER TREATMENT METHODS OF ANASTOMOSITOSES AFTER SURGICAL INTERVENTIONS IN THE GASTROINTESTINE AND DUODENUM

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Abstract

Despite the progress in the development of medical and endoscopic methods of treatment, PU surgery with its complicated course remains a subject of interest in terms of developing or improving various options for surgical approaches, the essence of which is aimed at reducing the incidence of various postoperative complications (Nazirov F.G., 2003; Vlasov A.P., 2020; Agaba E.A., 2016; Zhu C, 2021). In this regard, the frequency and spectrum of complications certainly depend both on the surgical technique and on other factors: the type of suture material, the initial condition of patients, and others (Olekseenko V.V., 2017; Hata T., 2014; Kumar P., 2014; Chiarello M.M., 2019; RosaF., 2019).

Gastric ulcer (GU) and duodenal ulcer (duodenal ulcer) is one of the most common pathologies in all regions of the world (Chaika A.V., 2018; Ruchkin D.V., 2019). At the same time, the prevalence of this pathology increases with increasing age (Chernousov A.F., 2016). In absolute terms, annually PU affects 4 million people worldwide, while complicated forms of the disease develop in 10-20% of patients (ThorsenK., 2013; Hasselager R.B., 2016).

The most common specific complication, regardless of the nature of the operation, is the development of clinically significant anastomositis with impaired evacuation function of the stomach stump (Andreou A., 2016; Diomidova V.N., 2018). According to the review on the fact of the incidence of post-gastroresection anastomosis, the frequency of this complication ranges from 5 to 61.5% (Illarionova I.N., 2019).

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In modern medicine, laser therapy with low-intensity laser radiation (LILI) is widely used. This name is due to the fact that low-intensity light fluxes (no more than 100 mW / cm2) are used for treatment. Two main areas of application of this type of laser radiation have been developed. The first is associated with various options for carrying out photodynamic therapy, which is actively used to treat the tumor process, in this case the laser has a damaging effect. The second direction is the treatment of inflammatory processes of a different spectrum, where radiation has a stimulating effect (Boulnois J.L. 2012; Zhu D., 2013; Grishaev V.A., 2019; Kalish Yu., 2011; Baibekov I.M., 2017).

Thus, the use of laser technologies in surgery is an urgent and popular topic with great development prospects. The combination of a high clinical effect and the virtual absence of contraindications makes this technique not just a physiotherapeutic procedure, but also an important component of a rehabilitation program, where LILI can be used both as an independent use and in combination with other physical and pharmacological methods (Kiefhaber P., 2005; Aleksandrov S.V., 2011).

Purpose of the study. Improving the results of treatment of anastomositis after various interventions on the stomach and duodenum.

Материал и методы

The clinical study was conducted in two categories of patients. The first is to evaluate the effectiveness of laser exposure to prevent the development of anastomoses. The second is the evaluation of the effectiveness of the treatment of late anastomoses. In all cases, the study included patients after surgery for complications of duodenal ulcer. A total of 175 patients were included, of which 131 (74.9%) patients were assigned to the category of preventive measures and 44 (25.1%) - to the category of treatment of late anastomoses. All patients are divided into two groups. The comparison group consisted of 98 patients (73 to assess the features of the course of early anastomosis and 25 with late anastomosis), in which the rehabilitation program was based on standard measures (Table 1).

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Table 1. Distribution of patients into study groups

Group	Comparison group (n=98)		Main group (n=77)		Total	
	abs	%	abs	%	abs.	%
Prevention of anastomositis	73	74,5%	58	75,3%	131	74,9%
Treatment of anastomosis	25	25,5%	19	24,7%	44	25,1%
Total	98	100%	77	100%	175	100%

Clinical groups to assess the effectiveness of preventing the development of postoperative anastomosis. In this part of the study, the analysis was carried out in 131 patients with duodenal ulcer. The main group consisted of 58 patients, the comparison group - 73 patients. Resection of the stomach according to the first Billroth method (RG B-I) was performed in 45 (34.4%) cases (26 - 35.6% in the comparison group and 19 - 32.8% in the main group). Resection of the stomach according to the second Billroth method (RG B-II) was performed in only 24 (18.3%) cases (13 - 17.8% and 11 - 19%, respectively). Excision of the ulcer with plasty was performed in 62 (47.3%) patients (34–46.6% and 28–48.3%) (Table 2).

RJ according to B-I in the modification of Gaberer-Finney and excision of the ulcer with duodenoplasty was carried out according to an improved method in our clinic, RJ according to B-II according to Hofmeister-Finstrer.

Table 2 Distribution of patients by type of surgical treatment of duodenal ulcer complications

Type of operation	Comparison group (n=98)		Main group (n=77)		Total (n=131)	
	абс	%	абс.	%	абс.	%
RJ according to B-I	26	35,6%	19	32,8%	45	34,4%
RJ according to B-II	13	17,8%	11	19,0%	24	18,3%
Ulcer excision	34	46,6%	28	48,3%	62	47,3%
Total	73	100,0%	58	100,0%	131	100,0%

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One of the first ways to treat anastomositis after gastric resection involved the parenteral administration of a nutrient solution and the evacuation of stagnant stomach contents. However, the treatment of anastomositis by this method requires at least two weeks, and in severe forms of anastomosis it is difficult for patients to tolerate and sometimes requires a second operation.

Thus, the task is to increase the effectiveness of the prevention and treatment of anastomosis by influencing several pathogenetic factors in the development of anastomosis at the same time.

The method for treating late anastomosis includes laser irradiation of the anastomosis zone with two types of low-energy lasers: endoscopic irradiation of the anastomosis mucosa using optical fiber optics with a diameter of 400-500 μm, radiation in the spectrum of 337 nm, a power of 3 mW, a duration of 1-2 min per 1 cm2 of the mucosa area. In total, 3 irradiation sessions are performed every other day (for example, 1 session on Monday, 2 session on Wednesday, 3 session on Friday), as well as combined exposure to radiation in the 890nm spectrum, frequency 80Hz, pulse power 5-7W for 3-4 minutes percutaneously in the projection of the anastomosis daily for 7 days.

Radiation in the spectrum of 337nm has a bactericidal and anti-inflammatory effect. The bactericidal effect is manifested starting from 45 seconds, increasing the dose with exposure to more than 2 minutes enhances the damaging effect on the mucosa of the gastrointestinal tract.

Radiation in the spectrum of 890nm in a pulsed mode (pulse power 5-7W, frequency 80 Hz) penetrates the tissues to a depth of 7 cm, has an analgesic effect, improves tissue microcirculation and promotes the resorption of scar tissue. This prevents the development of rigidity and stenosis, improves the functional results of surgery.

It was also noted that in the case of the development of anastomositis against the background of persistence of ligature inflammation, already during the second or third session of laser exposure, in almost all cases, it is possible to undercut and remove the ligature endoscopically. This becomes possible due to a pronounced local anti-inflammatory effect, which provides regression of hyperemia, edema and increased epithelialization of the erosive-ulcerative process.

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Results and Discussion

As a rule, postoperative anastomosis is considered as a physiological process and develops in all patients as a result of the intervention. However, it is considered physiological only in the next 5-7 days after the operation, while according to morphological criteria, the anastomosis should be catarrhal. With the development of clinical signs of anastomosis and its duration for more than 7 days, the rehabilitation process will be lengthened, since in these cases such a complication is no longer physiological and requires additional therapeutic measures.

A satisfactory course of the early postoperative period was characterized only by mild general clinical manifestations, which generally correspond to the severity of the operation. The intra- and postoperative measures proposed against the background of standard recommendations made it possible to increase the frequency of postoperative "physiological" anastomosis in the main group up to 6-7 days after surgery from 68.5% (in 50 patients in the comparison group) to 89.7% (in 52 of 58 patients; $\chi 2=9.202$; df=2; p=0.011).

Table 3 Distribution of patients according to the clinical severity of the course of postoperative "physiological" anastomosis

Severity	Comparison group (n=73)		Main group (n=58)	
	abs	%	abs.	%
Light	50	68,5%	52	89,7%
Medium	19	26,0%	6	10,3%
heavy	4	5,5%	0	0,0%
Total	73	100,0%	58	100,0%
χ^2	9,202; df=2; p=0,011			

Control endoscopy on days 7-8 due to the development of clinically significant anastomositis was performed in 37 patients in the comparison group and only in 8 patients in the main group (**Rice.**.1)

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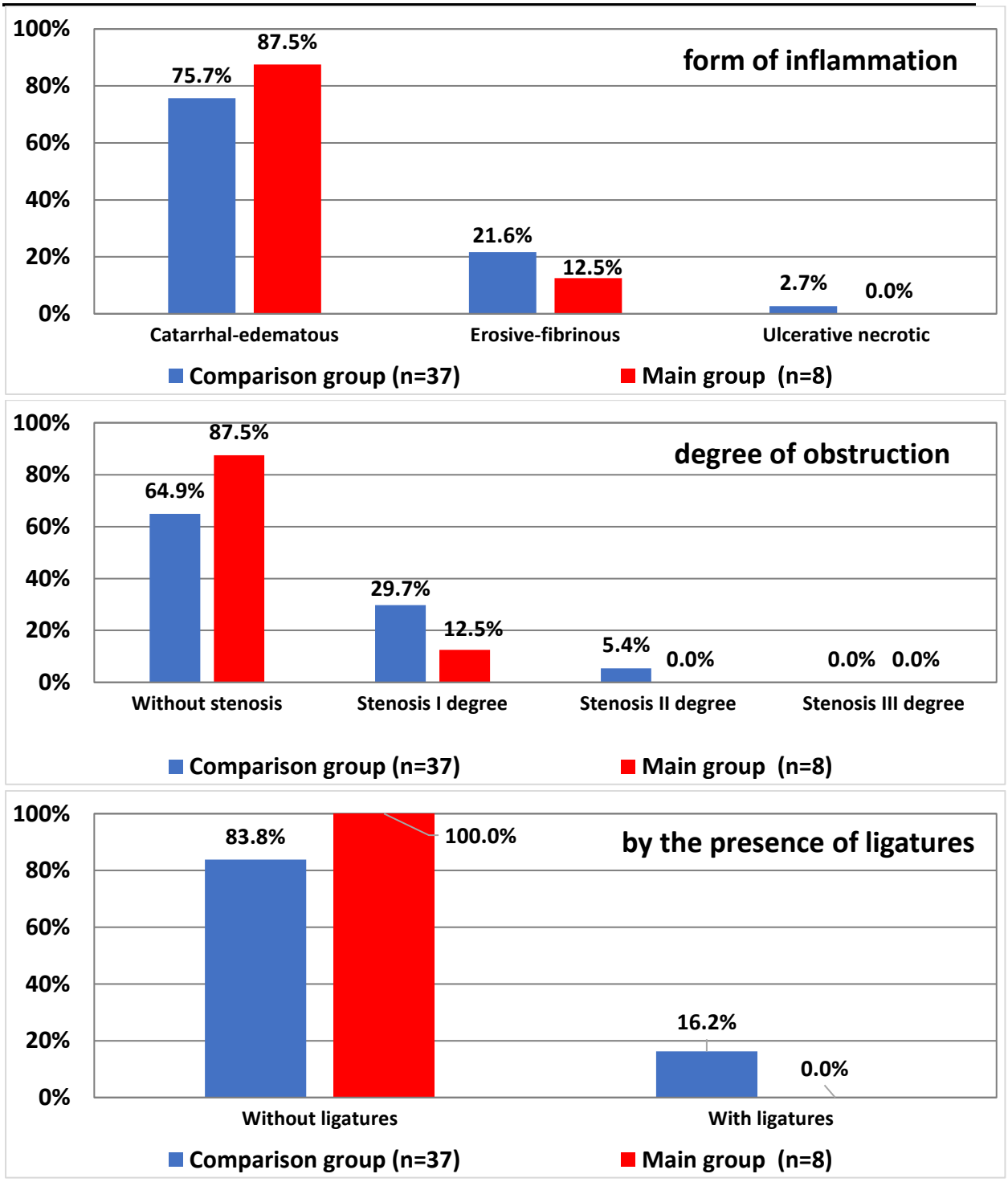

Rice. 1. Verified form of early prolonged postoperative anastomosis according to endoscopy

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Thus, the inclusion of the proposed method of laser exposure into a comprehensive program of early rehabilitation after surgical treatment of complicated duodenal ulcer made it possible to reduce the incidence of clinically significant anastomosis from 8.2% (in 6 patients in the comparison group) to 1.7% (in 1 patient in the main group). group) and in general specific complications that required additional measures from 13.7% (in 10 patients) to 3.4% (in 2 patients; $\chi2=4.081$; df=1; $p=0.044$), to increase the proportion of the physiological course of postoperative period already by 7 days from 49.3% (36 patients) to 86.2% (in 50 patients; $\chi2=19.547$; df=2; $p<0.001$), as well as to reduce the duration of the hospital period from 12.3±2, 5 to 10.5±2.0 days ($t=4.64$; $p<0.05$).

Conclusion

The complex use of low-energy laser exposure through endoscopic and percutaneous irradiation improved the effectiveness of the treatment of late anastomositis, which was manifested by an increase in the proportion of patients with the onset of regression of symptoms by day 3 from 28.0% to 68.4% ($\chi2=7.289$; df=2; p \u003d 0.027), an increase in the frequency of a mild form of the course already on the 5-6th day of treatment from 60.0% to 78.9%, with the absence of patency disorders in the anastomosis zone during these periods 68.4% (in the comparison group - 44.0%), as well as a reduction in the duration of the hospital period from 7.3±1.5 to 5.1±1.2 days ($t=5.52$; $p<0.05$).

References

1. Abdullaev A.E. Surgical treatment of perforated gastroduodenal ulcers using minimally invasive technologies: Dis. ... candidate med. Sciences. M. 2018.
2. Afanasiev D.V., Afanasiev V.N., Pleshkov V.G., Danilenkov N.V., Rodin A.V., Zabrosanev V.S., Moskalev A.P. Technique for the formation of gastroduodenoanastomosis in case of penetrating stenosing ulcers of the duodenum. Bulletin of Experimental and Clinical Surgery 2020; 13:3:248-255. DOI: 10.18499/2070-478X-2020-13-3-248-255.

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3. Baibekov I.M., Butaev A.Kh., Mardonov Zh.N., Davlatov S.S. Influence of LED radiation on the healing of experimental wounds//Problems of biology and medicine. - 2020. №1. Volume. 116. - S. 175-180.
4. Baibekov I.M., Karakozov P.E., Mardonov Zh.N. et al. "Influence of photo-influences on wounds, microcirculation and suture material". Ed. "LAP". Germany. 2020.
5. Gostishchev V.K., Evseev M.A., Golovin R.A. Radical surgical interventions in the treatment of patients with perforated gastroduodenal ulcers // Surgery. Journal them. N.I. Pirogov. - 2009. - No. 3. - P. 10–16.
6. Ibatullin A.A. Prevention and treatment of anastomositis in surgery of gastroduodenal ulcers: Ph.D. dis. … cand. honey. Sciences. - Ufa., 2002. - 24 p.
7. Illarionova I.N., Avtaeva D.A., Katanov E.S. Disease of the operated stomach. Anastomosis // Materials of the VI International Student Scientific Conference "Student Scientific Forum" URL: <a href="https://scienceforum.ru/2014/article/2014004298">https://scienceforum.ru/2014/article/2014004298.
8. Arman G.A., Himpens J., Bolckmans R. et al. Medium-Term Outcomes after Reversal of Roux-en-Y Gastric Bypass // Obes. Surg. – 2018. – Vol. 28 (3). – P. 781-790.
9. Best LM, Takwoingi Y, Siddique S, Selladurai A, Gandhi A, Low B, Yaghoobi M, Gurusamy KS. Non-invasive diagnostic tests for Helicobacter pylori infection. Cochrane Database Syst Rev. 2018 Mar 15;3(3):CD012080. doi: 10.1002/14651858.CD012080.pub2. PMID: 29543326; PMCID: PMC6513531.
10. Bohle W, Louris I, Schaudt A, Koeninger J, Zoller WG. Predictors for Treatment Failure of Self-Expandable Metal Stents for Anastomotic Leak after Gastro-Esophageal Resection. J Gastrointestin Liver Dis. 2020 Jun 3;29(2):145-149. doi: 10.15403/jgld-463. PMID: 32530980.
11. Zittel T.T., Jehle E.C., Becker H.D. Surgical management of peptic ulcer disease today - indication, technique and outcome. LangenbecksArchivesofSurgery 2000; 385(2):84-96.