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APPLICATION OF LASER TECHNOLOGY IN THE PREVENTION AND TREATMENT OF ANAL STRUCTURES AFTER HEMORROIDECTOMY

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Abstract

Hemorrhoids are one of the most common diseases of the anal canal and rectum, affecting 10-15% of the adult population, according to epidemiological studies. The aim of the study is to improve the methods of prevention and treatment of cicatricial narrowing of the anal canal after radical hemorrhoidectomy. The clinical part of the study included 297 patients with stage II-IV chronic combined hemorrhoids who underwent radical hemorrhoidectomy operations from 2010 to 2025 at the Khorezm Regional Multidisciplinary Medical Center, as well as 35 patients with cicatricial narrowing of the anal canal after hemorrhoidectomies performed in other institutions. In the main group, the average intraoperative blood loss was 27.6±17.2 ml, which was significantly lower ($t=6.65$; $P<0.001$) than in the comparison group (82.3±15.8 ml and 96.2±15.8 ml). The improved Milligan Morgan hemorrhoectomy technique with preservation of the mucocutaneous bridge and without suturing wounds in the transition zone helps to reduce pain reception, reduce hospital stay from 7.4±1.2 to 2.3±0.4 ($P<0.05$), reduce rehabilitation time from 28.4±2.9 to 17.5±2.6 days, and reduce the frequency of scarring anal canal stenosis from 7-12 to 0.9% ($P<0.05$).

Keywords

laser technology; hemorrhoidectomy; Milligan-Morgan operation; anal canal stricture.

Introduction. Hemorrhoids are the most common non-oncological anorectal condition in the world, and their incidence increases with age. [1]. Hemorrhoids do not have a tendency to spontaneous involution, and the main clinical manifestation and complication is hemorrhagic syndrome, which eventually leads to a number of complications in the form of bleeding. Moreover, the stage of the disease and the comorbid background of patients determine not only the nature, intensity, and regularity of bleeding, but also the tendency to recur and the risk of developing inflammatory processes with the addition of secondary infection [2, 3].

The results of fundamental research conducted in the last decade on the pathological physiology of hemorrhoids have led to changes in conservative and surgical treatment approaches [4]. Early forms of the disease can be successfully treated with phlebotonics, dietary fiber, and local therapy. If these methods are ineffective, the preferred treatment options include sclerotherapy, internal hemorrhoidal ligation with latex rings, and infrared photocoagulation [5-8]. The main disadvantage of minimally invasive treatment methods is the need for repeated procedures and a high frequency of recurrence of hemorrhoidal symptoms. In addition, minimally invasive methods are ineffective in the third and fourth stages of hemorrhoids, where excisional hemorrhoidectomy (Milligan and Morgan, Ferguson, Whitehead) is currently the primary treatment option. The goal of surgical treatment is to completely remove the internal and external components of the hemorrhoids. In addition, the procedure should have minimal postoperative pain and complications, as well as a lower rate of recurrence. Unfortunately, none of the currently available surgeries meet all of these criteria.

The purpose of the study is to improve the methods of prevention and treatment of scarring of the anal canal after radical hemorrhoidectomy.

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Materials And Methods. The clinical part of the study included 297 patients with stage II-IV chronic combined hemorrhoids (CCH) who underwent radical hemorrhoidectomy surgeries from 2010 to 2025 at the Khorezm Regional Multidisciplinary Medical Center, as well as 35 patients with scarred anal canal narrowing after hemorrhoidectomies performed in other institutions. All patients were divided into three groups based on the research objectives. The groups were comparable in terms of gender, age, type and severity of pathology, and type of surgery. The comparison group consisted of 152 patients who underwent traditional surgical interventions for complicated hemorrhoids (Milligan-Morgan, Whitehead), and the results were analyzed retrospectively for a comparative study. The main group included 145 patients who underwent radical hemorrhoidectomy without suturing the mucocutaneous bridge of the anal canal. There were 46 patients with grade 2-3 anal canal stricture after hemorrhoidectomy, of which 12 were observed after our surgeries. These patients were also divided into 2 groups. The comparison group consisted of 22 patients who were treated using the traditional method (anal sphincter devulsion and dosed anal sphincter dissection). The main group consisted of 24 patients who were treated using the original method involving combined laser exposure.

The patients' ages ranged from 19 to 76 years. The distribution of patients by gender and age is presented in Table 1. The average age in the main group-1 was 43.4±15.2 years, in the comparison group-1 – 41.2±17.1 years, and in the main group 2- 37.8+12.3 years and in the comparison group-2 – 46.7±11.9 years.

Table 1

Distribution of patients by gender and age in the study groups

Age	Sex	The main group - 1		Comparison group - 1		The main group - 2		Comparison group – 2	
		Abs	%	Abs	%	Abs	%	Abs	**%**
19-44 years	M	29	19,9%	31	20,4%	6	25,0%	5	22,7%
	F	14	9,6%	15	9,8%	3	12,5%	2	9,1%
45-59 years	M	48	33,1%	51	33,5%	7	29,1%	7	31,8%
	F	26	17,9%	33	21,7%	5	20,8%	5	22,7%
60-74 years	M	17	11,7%	15	9,8%	2	8,3%	2	9,1%
	F	11	7,5%	7	4,8%	1	4,2%	1	4,6%
Total	M	94	64,8%	97	63,8%	15	62,5%	14	63,6%
	F	51	35,2%	55	36,2%	9	37,5%	8	36,4%
	All	145	100%	152	100%	24	100%	22	100%

From the medical history, it was determined that in more than half (67.6%) of the cases, the duration of the disease was 5-10 years (Table 2).

Table 2

Distribution of patients with CCH by duration of the disease

Deadlines	The main group – 1		Comparison group – 1		The main group – 2		Comparison group – 2	
	Abs	%	Abs	%	Abs	%	Abs	%
Up to 3 years old	11	7,5%	13	8,5%	6	25,0%	8	36,3%
3-5 years old	27	18,7%	31	20,4%	11	45,9%	9	40,9%
5-10 years old	81	55,9%	83	54,6%	5	20,8%	4	18,2%

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10-20 years old	26	17,9%	25	16,5%	2	8,3%	1	4,6%
Total	145	100%	152	100%	24	100%	22	100%

The distribution of patients by stage of hemorrhoidal disease showed that most (68.7%) had stage III of the disease, and 24.2% had stage IV. Patients with hemorrhoidal disease had a complicated course and were treated in stages 3-4 of the disease (Table 3).

Table 3

Distribution of patients according to complications of chronic hemorrhoids

Complications of hemorrhoids	The main group		Comparison Group	
	Abs.	%	Abs.	%
Node loss	145	100%	152	100%
Recurrent bleeding	87	60,0%	91	59,8%
History of node thrombosis	12	8,2%	14	9,2%

Results. We have analyzed the results of radical treatment of stage 3-4 hemorrhoidal disease, depending on the following surgical methods:

- 63 patients who underwent Whitehead surgery from 2012 to 2018;
- 91 patients underwent Milligan-Morgan surgery from 2018 to 2024;
- 145 patients who underwent Milligan-Morgan surgery without suturing the defect in the skin-mucous membrane junction in the anal area using laser therapy and the local hemostatic drug Hemoben for hemostasis from 2020 to 2025.

In the main group, the average intraoperative blood loss was 27.6±17.2 ml, which was significantly lower (t=6.65; P<0.001) than in the comparison group (82.3±15.8 ml and 96.2±15.8 ml) (Fig. 1).

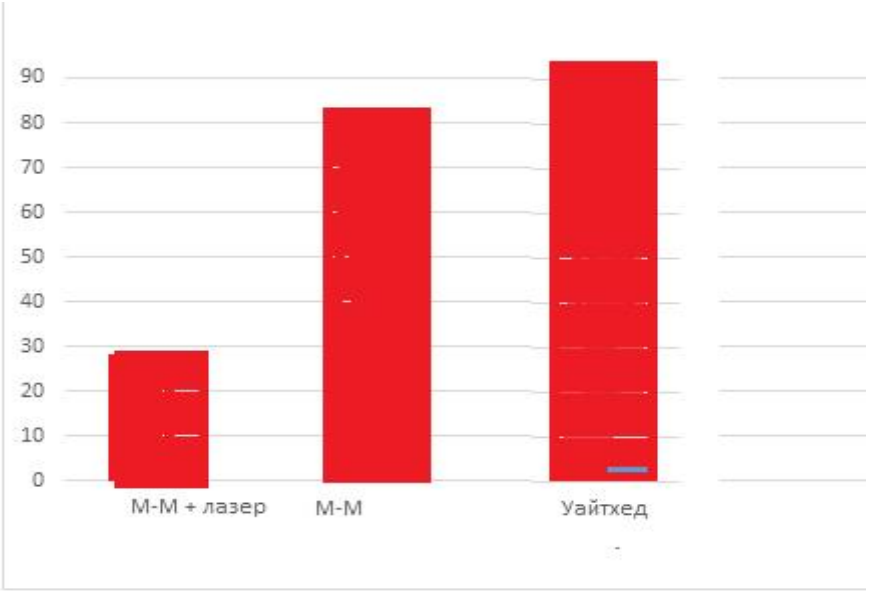

Fig. 1. Intraoperative blood loss (ml) during radical hemorrhoidectomy

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The duration of surgery in the comparison groups was 53.8±16.8 minutes and 67.3+11.7 minutes, with a statistically significant difference (t=5.21; P<0.05) longer than in the main group – 41.2±7.2 minutes (Fig. 2).

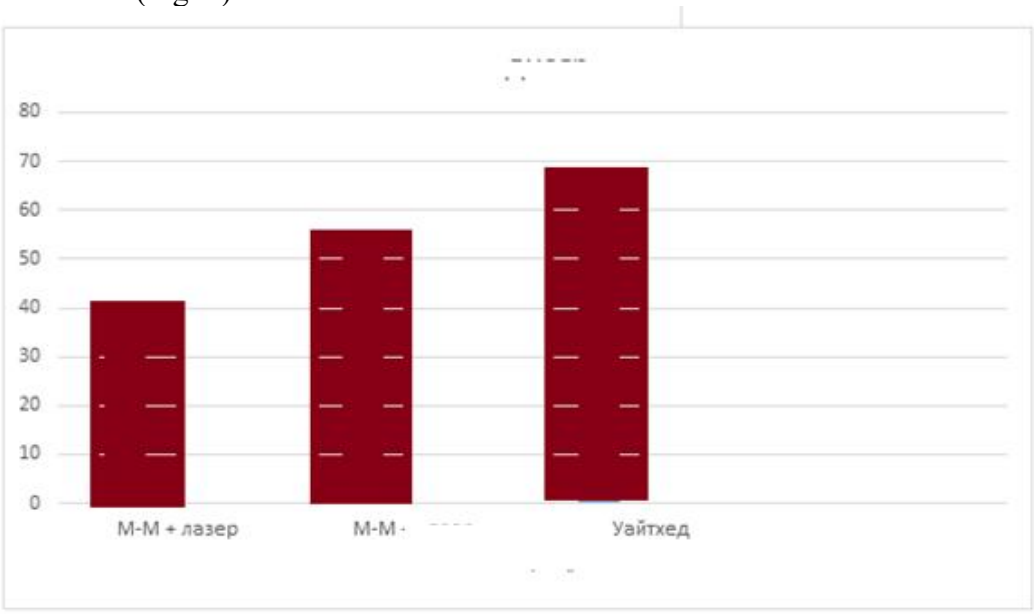

Fig. 2. Average duration of radical hemorrhoidectomy (min)

Compared to other types of surgical interventions, hemorrhoidectomy with the preservation of a mucosal-cutaneous bridge reduced pain perception (Table 4).

Table 4

The intensity of pain syndrome 24 hours after hemorrhoidectomy

Pain intensity	Whitehead 69		Milligan-Morgan 104		Milligan-Morgan without a skin-mucous membrane seam 108	
	Abs	%	Abs	%	Abs	%
No (0)	0	0,0%	0	0,0%	0	0
Minor (1-3 points)	0	0,0%	0	0,0%	19	17,6%
Moderate (4-6 points)	35	50,7%	79	76,0%	81	75,0%
Severe (7-9 points)	31	49,3%	25	34,0%	8	7,4%

The intensity of pain was significantly lower in the main group of patients 24 hours after surgery, which was manifested in 17.6% of cases by the absence of the need for administration of analgesics. Pain was relieved after performing hygienic baths.

Pearson's chi-square test was used to assess the differences in the distribution of pain intensity between the three patient groups (Whitehead, Milligan-Morgan, and Milligan-Morgan + Laser).

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The analysis results showed statistically significant differences: χ^2=61.45; df=4; p<0.0001.

The highest proportion of severe pain (7–9 points) was observed in the Whitehead group (49.3%), while in the Milligan-Morgan group without a suture, this figure was only 7.4%. In addition, only in the Milligan-Morgan group without a suture, cases of minor pain (1–3 points) were recorded - 17.6% of patients.

Thus, the Milligan-Morgan method without a suture is associated with a significant reduction in postoperative pain.

Complications in the postoperative period manifested themselves in the form of bleeding, wound infection, and urinary problems. Incontinence of gases in the early postoperative period was quite common, but it was completely resolved within 1-3 weeks after the operation and was largely dependent on the degree of anal dilation.

Thus, in the main group, after the use of the combined laser method, there was a significant increase in the diameter of the anal canal and a decrease in pain syndrome. The average resting sphincter pressure was higher, indicating the preservation of muscle function. The frequency of relapses decreased by more than 5 times.

When analyzing the degrees of stenosis, it was found that the highest effectiveness was observed in patients with grade I-II stenosis, where the diameter and subjective pain assessment were close to normal, while patients with grade III stenosis showed a tendency towards improvement but required repeated dilatations.

Conclusion. 1. Radical hemorrhoidectomy with damage to the mucosal-cutaneous junction by more than 2/3 of the circumference of the anal canal and suturing in the longitudinal and especially in the transverse direction leads to the development of scarring of the anal canal in 7–12% of cases. Operations involving transverse tissue division (Whitehead method) are associated with a higher frequency of scarring of the anal canal compared to longitudinal techniques (Milligan–Morgan in Ferguson modification).

2. The improved Milligan Morgan hemorrhoectomy technique with preservation of the mucocutaneous bridge and without suturing wounds in the transition zone helps to reduce pain reception, reduce hospital stay from 7.4±1.2 to 2.3±0.4 (P<0.05), and reduce rehabilitation time from 28.4±2.9 to 17.5±2.6 days (P<0.001), as well as a decrease in the frequency of cicatricial narrowing of the anal canal from 7-12 to 0.9% (P<0.05).

References:

1. Tournu G, Abramowitz L, Couffignal C, Juguet F, Sénéjoux A, et al.; GREP study group; MG-PREVAPROCT study group. Correction to: Prevalence of anal symptoms in general practice: a prospective study. BMC Fam Pract. 2019;20(1):14.

2. Sun Z, Migaly J. Review of Hemorrhoid Disease: Presentation and Management. Clin Colon Rectal Surg. 2016;29(1):22-9.

3. Yakubov F.R., Erniyazov E.A., Sapaev D.S. (2023). Modern Treatment of Mallory-Weiss Syndrome. International journal of health systems and medical sciences, 2(4), 27–33. Retrieved from https://inter-publishing.com/index.php/IJHSMS/article/view/1415

4. Pata F, Sgró A, Ferrara F, Vigorita V, Gallo G, Pellino G. Anatomy, Physiology and Pathophysiology of Haemorrhoids. Rev Recent Clin Trials. 2021;16(1):75-80.

AMERICAN ACADEMIC PUBLISHER

INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

ISSN NUMBER: 2692 - 5206 Volume 6. No 01. January ,2026

5. Zagriadskiĭ E.A, Bogomazov A.M, Golovko EB. Conservative Treatment of Hemorrhoids: Results of an Observational Multicenter Study. Adv Ther. 2018;35(11):1979-92.

6. Ismailov Saidmurad Ibragimovich et al. (2024). Novel Endoscopic Technique in Treating Colon Neoplasms with Improved Clinical Outcomes, Journal of Angiotherapy, 8(6), 1-6, 9748. https://doi.org/10.25163/angiotherapy.869748

7. Ataullaevich, A. K., Khasanovich, B. A., Abrarovich, S. R., Eshmurodovich, R. A., Bazarbaevich, O. G., Sultanbaevich, B. A., Radjabovich, Y. F., & Shukhratovich, S. D. (2023). A new method of surgical treatment of rectal prolapse. Migration Letters, 20(S8), 1512–1519. https://doi.org/10.59670/ml.v20iS8.6111

8. Акилов Хабибулла Атауллаевич, Рустамов Абдусамад Эшмуродович, & Сапаев Дусчан Шухратович (2023). Оценка эффективности нового способа хирургического лечения выпадения прямой кишки. Вестник хирургии имени И. И. Грекова, 182 (3), 47-53. doi: 10.24884/0042-4625-2023-182-3-47-53