

# Results of surgical treatment of chronic hemorrhoids in patients with drug-induced hypocoagulation

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**Abstract** - The purpose of the research is to study the results of surgical treatment of chronic stage III-IV hemorrhoids in patients with drug hypocoagulation. **Material and Methods.** The basis of the study were 230 patients with chronic combined hemorrhoids stage III-IV, concomitant cardiovascular pathology and against the background of antiplatelet or anticoagulant therapy, treated at the Urgench branch clinic of Tashkent Medical Academy during 2010-2021. The comparison group consisted of 118 individuals who underwent Milligan-Morgan hemorrhoidectomy and the results were examined retrospectively. Hemorrhoidectomy by Milligan-Morgan was combined with the proposed approach and a domestic hemostatic agent "Heprocel" in the form of a gel in the main group - 112 patients, prospective analysis. The age of the patients ranged from 19 to 74 years old. The patients were 48,1±14,6 years old on average. There was an association of CHD with stable angina pectoris in 42.0 percent (47 of 112) cases in the main group and 45.8 percent (54 of 118) cases in the comparison group. Mitral valve insufficiency, aortic valve stenosis, and hypertension were found in the remaining patients. **Results.** A comparative analysis of the results of hemorrhoidectomy in patients with anticoagulation showed that application of hemostatic agent to the area of dissected tissue in the anal sphincter area due to high adhesive and barrier function allowed to decrease the intensity of pain syndrome (4,3±1,3 points in comparison group vs 3,5±1,0 points in the main group on the 3rd day after surgery;  $t=5,42$ ;  $p<0,001$ ), decrease of postoperative period complications rate by hemorrhagic syndrome from 18,6% to 6,3% ( $\chi^2=7,165$ ;  $Df=1$ ;  $p=0,005$ ), and in 2,5% of cases (3 patients in the control group) additional stitching of the removed node stump was required. Patients in the main group recovered faster, reducing their hospital stay from 6.51.4 to 5.21.3 days ( $t=7.65$ ;  $p0.001$ ) and their overall postoperative rehabilitation time from 15.42.9 to 11.52.6 days ( $t=10.49$ ;  $p0.001$ ). Overall, in the main group, the proportion of good and satisfactory surgical outcomes increased from 93.2 percent to 98.2 percent ( $2=11.958$ ;  $Df=2$ ;  $p=0.003$ ). **Conclusion.** The proposed method of hemorrhoidectomy in patients with drug-induced hypocoagulation due to cardiogenic pathology includes hemorrhoidectomy according to Milligan-Morgan with complete repair of anal mucosa using atraumatic resorbable sutures as well as dissection of anal sphincter with application of 4% gel Gelprocel to the wound, which ensures improvement of quality and stability of local hemostasis.

**Index Terms** - Chronic stage III-IV hemorrhoids, drug-assisted hypocoagulation, surgical treatment, hemorrhoidectomy, local hemostasis, Heprocel.

## INTRODUCTION

Hemorrhoids, being the most prevalent non-oncological anorectal pathology in the world, tend to increase in frequency of occurrence with population age [1, 2]. The main clinical manifestation and complication of hemorrhoids is bleeding, and the stage of the disease and comorbid background of patients determine not only the character, intensity and regularity of bleeding, but also the tendency to recurrence and the risk of inflammatory processes with secondary infection [3, 4]. The results of fundamental research in the aspect of pathological physiology of hemorrhoidal disease in the last decade have allowed changing approaches to conservative and surgical treatment [5, 6]. Thus, early forms of the disease are successfully treated with phlebotonics, dietary fiber and local therapy, and if ineffective, the methods of choice are sclerotherapy, ligation of internal hemorrhoids with latex rings, infrared photocoagulation [7, 8, 9]. The main incommmodity of minimally invasive treatment techniques is the need to repeat manipulations and the high frequency of recurrence of hemorrhoid symptoms. Moreover, minimally invasive techniques are ineffective in stages III and IV of hemorrhoids, in which excisional hemorrhoidectomy (according to Milligan and Morgan or Ferguson) is the main operation of nowadays. Some specific clinical conditions, including concomitant cardiovascular pathology and coagulopathy, on the background of regular rectal bleeding complicate the treatment of hemorrhoidal disease, cause its progression and worsen the outcomes [10, 11, 12]. Therefore, treatment of hemorrhoidal disease for this category of patients should be as radical as possible, the least invasive, and without cancellation of antiplatelet or anticoagulant therapy. The aim of the study was to elaborate the results of surgical treatment of chronic stage III-IV hemorrhoids in patients with drug-induced hypocoagulation by improving the method of hemorrhoidectomy with the use of applicative hemostatic agent.

## MATERIAL AND METHODS

The study was based on 230 patients with chronic combined hemorrhoids, concomitant cardiovascular illness, and antiplatelet or anticoagulant medication who were treated at Tashkent Medical Academy's Urgench branch clinic from 2010 to 2021. All patients were divided into two groups according to the study directions. The groups were comparable by sex, age, type and severity of pathology, and type of surgical intervention. The comparison group consisted of 118 patients in whom the analysis of results for the comparative study was performed retrospectively, all patients regularly received antiaggregants or anticoagulants for various cardiovascular diseases to create drug-induced hypocoagulation, all patients underwent hemorrhoidectomy by Milligan-Morgan. Hemorrhoidectomy by Milligan-Morgan was combined with the use of the proposed method to enhance the local hemostatic effect by applying the domestic hemostatic agent "Heprocel" in the form of gel in the main group - 112 patients with chronic combined hemorrhoids (CCH) and drug hypocoagulation due to concomitant cardiovascular pathology. The patients ranged in age from 19 to 74. The main group had a mean age of 48.114.6 years, while the comparison group had a mean age of 46.5133.3 years. The duration of the condition was found to be 5-10 years in more than half of the cases (56.1 percent; 183 of 326) based on the history. The distribution of patients according to the stage of CCH showed that the majority (65.3%; 213 of 326) had stage III disease, while the remaining 34.7% (113 of 326) were diagnosed with stage IV CCH. Moreover, 12.9% (42 of 326) cases of stage III CCH and 8.0% (26 of 326) of stage IV CCH were combined with anal fissure. Patients on anticoagulant therapy were 54.5% (61 of 112) in the main group and 53.4% (63 of 118) in the comparison group. In the remaining cases, the patients received antiplatelet therapy. There was an association of ischemic heart disease (IHD) with stable angina pectoris in 42.0 percent (47 of 112) cases in the main group and 45.8 percent (54 of 118) cases in the comparison group. Mitral valve insufficiency, aortic stenosis (19.6 percent and 17.8 percent in the main group and 23.7 percent in the comparison group), hypertension (8.0 percent and 8.5 percent in the comparison group), and arrhythmic form of CHD were the next most common (25.9% in the main group and 23.7 percent in the comparison group) (4.5 percent and 4.2 percent).

Patients had undergone surgical procedures for concurrent cardiovascular diseases (CVD) in the past. Aortocoronary bypass and/or coronary stenting were performed on individuals with IHD. Patients with acquired valve pathology had their mitral or aortic valves replaced.

CCH in all patients included in the study had a complicated clinical course. Therefore, in 100% of cases, there was a prolapse of hemorrhoids. In addition, in most cases (90.2% in the main group and 90.7% in the comparison group) there was recurrent bleeding. Pain syndrome and itching occurred with almost equal frequency - 50.3% (164 out of 326) and 42.0% (137 out of 326), respectively. Single bleeding was noted only by 9.3% (11 of 118) patients in the comparison group and 9.8% - (11 of 112) in the main group.

In the main group, the Milligan-Morgan method of hemorrhoidectomy was applied using a rectal mirror, excision and stitching of external and internal hemorrhoids, dissection of the anal sphincter at 6 hours according to Aminev and complete restoration of the mucous membrane of the anal canal. At the same time, bleeding from dissected tissues in the anal sphincter area is stopped by double application of the hemostatic agent "Heprocel" prepared at the rate of 4 g of powder "Heprocel" diluted with 100 ml of saline for 5 minutes until the formation of a gel with a viscous consistency. The use of the domestic remedy "Heprocel" provides high hemostatic activity at the area of application with effective stopping of bleeding from dissected tissues, thereby minimizing the volume of intra- and postoperative blood loss.

The method is carried out as follows: In patients with chronic hemorrhoids III-IV stages against the background of drug hypocoagulation for concomitant cardiovascular pathology, surgery is performed under general anesthesia to prevent the formation of hematomas and the risk of infection, which can occur with local infiltration anesthesia with novocaine. The first stage is the expansion of the anal sphincter using a rectal speculum. In the wound, the internal and external hemorrhoids are gradually removed and excised with stitching of the vascular pedicle according to the Milligan-Morgan method with suturing of the mucous membrane with continuous absorbable atraumatic sutures. An anal fissure is visualized. The latter is dissected in a metered manner in 6 hours using a scalpel or coagulator in cutting mode. Bleeding from the edges of the wound, as well as in places where hemorrhoids are removed, is stopped by tamponing with a napkin soaked in 4% Heprocel gel. Control of hemostasis within 5 minutes. In places of active bleeding of a mixed nature, the bleeding vessel is coagulated with an electro coagulator and subsequently tamponed again with a napkin soaked in Heprocel gel. After the operation, a napkin soaked in 4% Heprocel gel is also applied to the area of the anal canal wound to prevent bleeding from the granulating wound.

## RESULTS

The volume of intraoperative blood loss was studied as one of the main criteria. Thus, the average volume of intraoperative blood loss was  $66.8 \pm 19.0$  ml in the main group, which was significantly lower ( $t = 6.65$ ;  $P < 0.001$ ) than in the comparison group ( $86.6 \pm 25.8$  ml). The average duration of surgery in the comparison group was  $50.2 \pm 7.9$  minutes, with a statistically significant difference ( $t = 5.31$ ;  $P < 0.001$ ) longer than in the main group -  $44.6 \pm 8.0$  minutes. In parallel with the implementation of the developed method with the use of the drug "Heprocel" in the main group of patients, there was a significant decrease in the intensity of pain sensations and, in a comparative aspect, according to the rating scale for assessing pain, the following results were obtained (Table 1).

**Table 1. Pain intensity syndrome according to the pain rating score (scores; M±δ)**

Indicators	Main group	Comparison group	t	P
One day	5,8±1,2	6,4±1,3	4,04	<0,001
Three days	3,5±1,0	4,3±1,3	5,42	<0,001
Five days	2,3±0,9	2,9±1,1	4,33	<0,001
Duration of analgesia (days)	3,4±1,0	4,3±1,2	6,14	<0,001

So, on the 1st day after surgery, the average pain intensity score in the main group was  $5.8 \pm 1.2$  points, while in the comparison group the result was  $6.4 \pm 1.3$  points ( $p < 0.001$ ). Further, this trend was also noted with the best results in the main group with a statistically significant difference. The duration of analgesia was  $3.4 \pm 1.0$  days in the main and  $4.3 \pm 1.2$  days in the comparison group ( $t = 6.14$ ;  $p < 0.001$ ).

**Table 2. Intensity of pain syndrome day after hemorrhoidectomy**

Pain intensity	Main group		Comparison group	
	quantity	%	quantity	%
No(0)	0	0,0%	0	0,0%
Insignificant (1-3 scores)	0	0,0%	0	0,0%
Mild (4-6 scores)	88	78,6%	77	65,3%
Denominated (7-9 scores)	24	21,4%	41	34,7%
$\chi^2$	5,026; Df=1; p=0,025			

The pain intensity index assessed one day after surgery (Table 2) corresponded to 4-6 points (moderate pain) in 78.6% (88 patients) of cases in the main group and 65.3% (77) of cases in the comparison group. At the same time, severe pain (7-9 points) was noted with a statistically significant ( $\chi^2 = 5.026$ ; Df = 1;  $p = 0.025$ ) less frequency in the main group (21.4%; 24 patients) than in the comparison group (34.7 %; 41 patients). Insignificant pain score (1-3 points) and no pain were observed in both study groups.

Further, the assessment of pain intensity on the 5th day after hemorrhoidectomy showed that severe pain syndrome was not observed in any case in both study groups (Table 3). In a significant part of the patients, both in the comparison group (72.0%) and in the main group (84.8%), results of 1-3 points were obtained, corresponding to the category of insignificant pain in the operation area.

**Table 3. Intensity of pain syndrome 5 days after hemorrhoidectomy**

Pain intensity	Main group		Comparison group	
	quantity	%	quantity	%
No (0)	5	4,5%	2	1,7%
Insignificant (1-3 points)	95	84,8%	85	72,0%
Mild (4-6 points)	12	10,7%	31	26,3%
Denominated (7-9 points)	0	0,0%	0	0,0%
$\chi^2$	10,087; Df=2; p=0,007			

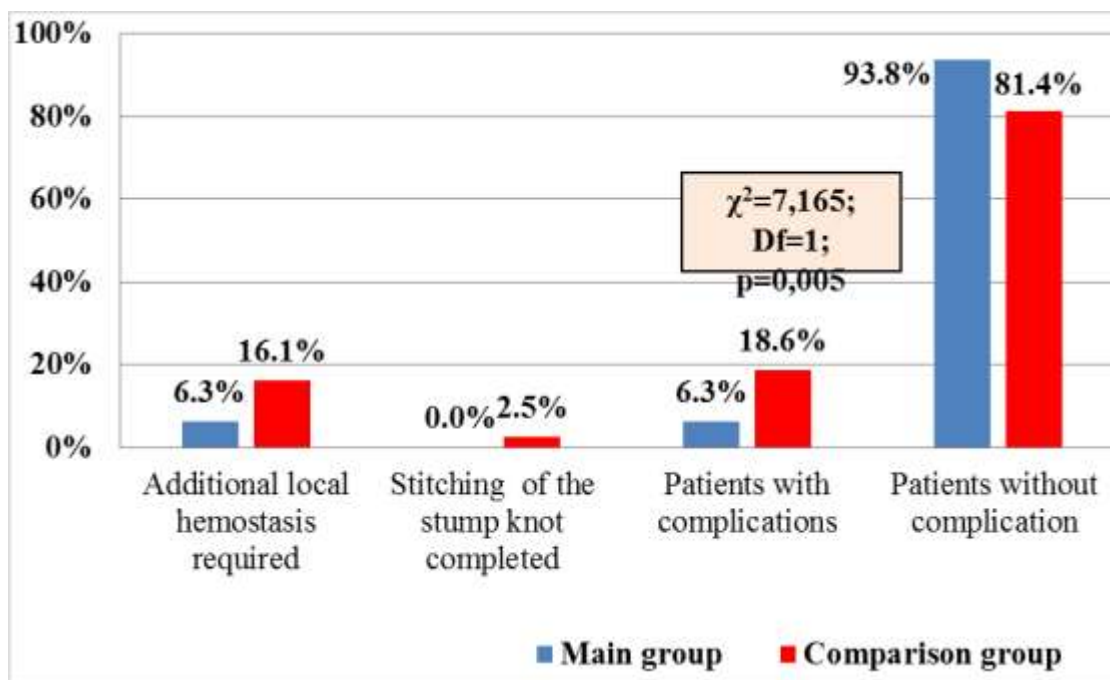
The study of the postoperative period course features (Table 4) showed that insignificant hemorrhage occurred with a statistically significant ( $\chi^2 = 14.788$ ; Df = 1;  $p < 0.001$ ) lower frequency in the main group - 14.3% (16 patients) of cases than in the comparison group - 36.4% (43 patients).

**Table 4. Features of the postoperative period course**

Complications	Main group		Comparison group		$\chi^2$ ; Df=1	
	Quantity	%	Quantity	%	Significance	p
Insignificant hemorrhage	16	14,3%	43	36,4%	14,788	<0,001
Bleeding from the stump of the knot	0	0,0%	4	3,4%	3,864	0,050
Reflective urinary retention	11	9,8%	12	10,2%	0,008	0,930

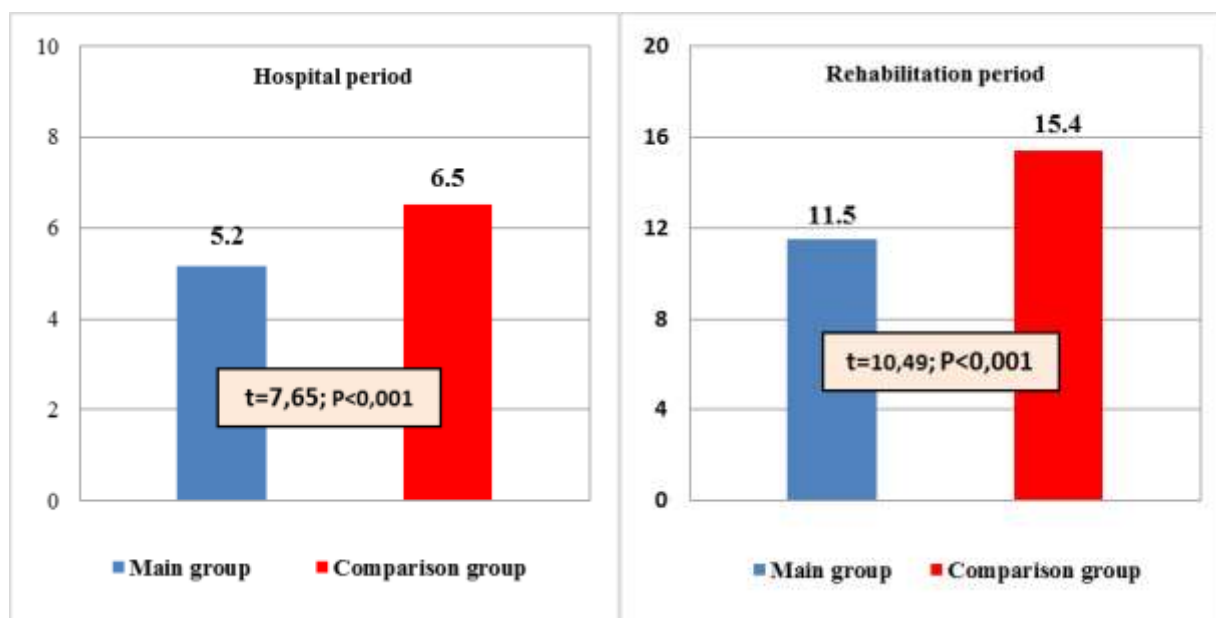
In the main group, bleeding from the hemorrhoid stump was not observed, and in the comparison group, this indicator was 3.4% (4 patients). In addition, there were no intergroup differences in the incidence of postoperative reflex urinary retention (Table 4).

The incidence of cases with postoperative complications (Fig. 1) requiring additional interventions was 6.3% (7 cases) in the main group and 18.6% (22 cases) in the comparison group ( $\chi^2 = 7.165$ ; Df = 1;  $p = 0.005$ ). In this structure, in all cases of complicated course in the main group, additional local hemostasis was effective, while in the comparison group, in addition to local hemostasis (16.1%), stitching of the node stump was performed (2.5%).



**Fig. 1. The frequency of the complicated course of the postoperative period for hemorrhagic syndrome**

The second picture showed that, the average duration of the hospital stage of treatment in main group included  $5,2 \pm 1,3$  days that was statistically ( $t=7,65$ ;  $P<0,001$ ) lower than in group of comparison where the indicator composed  $6,5 \pm 1,4$  days.



**Fig. 2. Average duration of hospital and general rehabilitation period (days)**

Duration of rehabilitation period after hemorrhoidectomy with application of the suggested technique of local hemostasis in patients with concomitant anticoagulation was only  $11,5 \pm 2,6$  days (the main group), while classical hemorrhoidectomy in this cohort of patients was accompanied by a longer rehabilitation period ( $t=10,49$ ;  $P<0,001$ ) -  $15,4 \pm 2,9$  days (comparison group).

**Table 5.** Frequency of hemorrhagic complications after discharge up to 3 months of observation

Criterion	Main group		Comparison group	
	quantity	%	quantity	%
Occasional scanty hemorrhagic discharge	6	5,4%	13	11,0%
Hemorrhage requiring applicative hemostasis	2	1,8%	5	4,2%
Hemorrhage that required stitching	0	0,0%	2	1,7%
Patients with complications	8	7,1%	20	16,9%
Patients without complications	104	92,9%	98	83,1%
$\chi^2$	5,168; Df=1; p=0,024			

The postoperative period was followed up to 3 months during which a complicated course was registered in 7.1% (8 out of 112) cases in the main group of patients and in 16.9% (20 out of 118) cases in the comparison group ( $\chi^2=5.168$ ; Df=1; p=0.024). As can be seen from Table 5, periodic scanty hemorrhagic discharge made up the majority in the structure of the complicated course and was registered in 5.4% of cases in the total cohort of the study group patients (6 of 112). At the same time, in the comparison group this complication was observed at a rate of 11.0% (13 of 118), which was statistically significantly higher. Hemorrhage requiring applicative hemostasis was observed with a frequency of 1.8% (2 of 112) in the main group and 4.2% (5 of 118) in the comparison group. Hemorrhage requiring stitching was not observed in the main group, yet was observed in 2 (1,7%) patients in the comparison group that also testifies to high clinical effectiveness of the suggested techniques of chronic hemorrhoids treatment in patients with accompanying cardiovascular pathology requiring medication-assisted hypocoagulation.

We defined the following definitions of good, satisfactory and unsatisfactory results of chronic combined hemorrhoids treatment:

- good - absence of clinical manifestations (hemorrhage, pain syndrome);
- satisfactory - insignificant hemorrhagic discharge (corresponding to BARC type I) in the first month after operation; periodic pain syndrome;
- unsatisfactory - development of recurrent hemorrhagic syndrome that required hospitalization for hemostasis.

According to hemorrhoidectomy summary statistics, 89.3 percent (100 out of 112) of patients had a positive outcome. In the main group of patients, there was a statistically significant difference in contrast to the comparison group, where 79.7 percent (94 out of 118) patients had a favorable outcome. The frequency of unsatisfactory results was 1.8% (2 of 112) in the main group and 6.8% (8 of 118) in the comparison group ( $\chi^2=11.958$ ; Df=2; p=0.003).

### CONCLUSIONS

The proposed method of hemorrhoidectomy with concomitant anal fissure in patients with medication-assisted hypocoagulation due to cardiogenic pathology includes hemorrhoidectomy by Milligan-Morgan with complete restoration of anal mucosa using atraumatic resorbable sutures as well as anal sphincter dissection with application of 4% Gelprocel gel to the wound, which provides improvement of quality and stability of local hemostasis.

A comparative analysis of the results of hemorrhoidectomy in patients with medication-assisted hypocoagulation showed that application of hemostatic agent to the area of dissected tissue in the anal sphincter area due to high adhesive and barrier function allowed to decrease the intensity of pain syndrome ( $4,3\pm 1,3$  points in comparison group vs  $3,5\pm 1,0$  points in the main group on the 3<sup>rd</sup> day after surgery;  $t=5,42$ ;  $p<0,001$ ), reduce the rate of complicated course of postoperative hemorrhagic syndrome from 18,6% to 6,3% ( $\chi^2=7,165$ ; Df=1;  $p=0,005$ ), at the same time in 2,5% of cases (3 patients in the control group) additional stitching of the removed node stump was required.

- Patients in the main group recovered faster, reducing their hospital stay from  $6,5\pm 1,4$  to  $5,2\pm 1,3$  days ( $t=7,65$ ;  $p<0,001$ ), and the total postoperative rehabilitation period from  $15,4\pm 2,9$  to  $11,5\pm 2,6$  days ( $t=10,49$ ;  $p<0,001$ ). Overall, the proportion of good and satisfactory surgical outcomes in the main group improved from 93,2% to 98,2% ( $\chi^2=11,958$ ; Df=2;  $p=0,003$ ).

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