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Simultaneous treatment for anal fissure and hemorrhoids

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When using surgical approach to treatment for combined anal fissure and hemorrhoids doctor always faces the question of whether to divide the procedure into two sequential stages or to perform a simultaneous surgical intervention, and in which cases one or the other should be done.

Purpose – to improve the results of treatment for patients with anal fissure in combination with chronic hemorrhoids by combining fissurectomy with transanal hemorrhoidal dearterialization (THD).

Materials and methods. 177 patients with combination of anal fissure and hemorrhoids were studied. The Group I (GI) – fissure excision and hemorrhoidectomy, 60 patients. The Group II (GII) – anal fissure excision without surgery for hemorrhoids, 60 patients. The Group III (GIII) – proposed method used, 57 patients. Laser Doppler flowmetry was performed to assess blood flow intensity in fissure area. The assessment of treatment outcomes in patients was based on the following criteria: pain intensity, urinary retention in early postoperative period, postoperative wound suppuration, disease recurrence, iatrogenic incontinence, duration of postoperative hospital stay. Qualitative parameters are presented as the absolute number of cases (n) and their percentage (%). Comparison of these parameters between groups was performed using the Pearson's χ^2 test and the Fisher's exact test. Statistical analysis was conducted by STATA 12.1 statistical package.

Results. Pain intensity: GI – 8±1, GII – 6±2, GIII – 4±1. Urinary retention: GI – 19 (31.6%), GII – 8 (13%), GIII – 6 (10.5%). Wound suppuration: GI – 5 (8.3%), GII – 1 (1.7%), GIII – 1 (1.7%). Hospital stay (days): GI – 6±1.2, GII – 4±1.3, GIII – 3±1.1. Fissure recurrences: GI – 5 (8.3%), GII – 2 (3.3%), GIII – 1 (1.7%). Hemorrhoid recurrence: GI – 6 (10%), GIII – 2 (3.5%). Iatrogenic incontinence: GI – 4 (6.7%), GII – 1 (1.7%), GIII – 0. Significant decrease in relative risk of complications (by 88%) in GIII compared with GI – OR=0.12 (0.04–0.29), p=0.0001, and a tendency to reduction of complication risk by 15% compared with GII – OR=0.85 (0.29–2.4), p=0.734 was observed. Blood flow intensity (flowmetry results) in GII and GIII was comparable.

Conclusions. Simultaneous anal fissure excision and THD can improve treatment outcomes. This method does not impair blood flow in the area of anal fissure. Proposed method is both radical and minimally invasive.

The research was carried out in accordance with the principles of the Helsinki Declaration. The study protocol was approved by the Local Ethics Committee of all participating institutions. The informed consent of the patient was obtained for conducting the studies.

No conflict of interests was declared by the authors.

Keywords: hemorrhoids, anal fissure, laser Doppler flowmetry, transanal hemorrhoidal dearterialization (THD), fissure excision.

Симультанне лікування анальної тріщини та геморою

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У разі застосування хірургічного підходу до лікування анальної тріщини комбінованої з гемороєм перед лікарем завжди постає питання, чи розділяти процедуру на два послідовних етапи, чи проводити одночасне оперативне втручання, і в яких випадках слід робити те чи інше.

Мета – поліпшити результати хірургічного лікування пацієнтів із поєднанням анальної тріщини та геморою шляхом симультанного висічення тріщини і трансанальної гемороїдальної деартеріалізації (ТГД).

Матеріали та методи. Обстежено 177 пацієнтів із поєднанням анальної тріщини та геморою. Усі пацієнти поділені на групи: I група – висічення тріщини та гемороїдектомія, 60 пацієнтів. II група – висічення анальної тріщини без операції з приводу геморою, 60 пацієнтів. III група – оригінальний метод, 57 пацієнтів. Для оцінювання інтенсивності кровотоку в ділянці тріщини виконано лазерну допплерну флоуметрію. Результати лікування пацієнтів оцінено за такими критеріями: інтенсивність больового синдрому, затримка сечі в ранньому післяопераційному періоді, частота виникнення нагноєння післяопераційної рани, рецидивів та інконтиненції, тривалість перебування пацієнта у стаціонарі після операції. Якісні параметри наведено у вигляді абсолютної кількості випадків (n) та їхньої частки у %. Порівняння цих параметрів між групами проведено з використанням критерію χ^2 Пірсона. Для кількісних ознак на попередньому етапі оцінено відповідність їх нормальному розподілу за критерієм Шапіро-Уілка. Статистичний аналіз проведено з використанням статистичного пакету «STATA 12.1».

Результати. Інтенсивність болю: I група – 8±1, II група – 6±2, III група – 4±1. Затримка сечі: I група – 19 (31,6%), II група – 8 (13%), III група – 6 (10,5%). Нагноєння рани: I група – 5 (8,3%), II група – 1 (1,7%), III група – 1 (1,7%). Перебування в стаціонарі (дні): I група – 6±1,2, II група – 4±1,3, III група – 3±1,1. Рецидив тріщини: I група – 5 (8,3%), II група – 2 (3,3%), III група – 1 (1,7%). Рецидив геморою: I група – 6 (10%), III група – 2 (3,5%). Інконтиненція: I група – 4 (6,7%), II група – 1 (1,7%), III група – 0. Узагальнена оцінка за частотою ускладнень свідчить про суттєве зниження відносного ризику ускладнень (на 88%) у III групі порівняно з I групою – OR=0,12 (0,04–0,29), p=0,0001, а також про тенденцію до зниження ризику ускладнень на 15% порівняно з II групою – OR=0,85 (0,29–2,4), p=0,734. Інтенсивність кровотоку (результати флоуметрії) в II та III групах була порівняною.

Висновки. Одночасне висічення анальної тріщини та ТГД може поліпшити результати лікування. Цей метод не порушує кровотоку в ділянці анальної тріщини. Запропонований метод одночасно є як радикальним, так і мініінвазивним.

Дослідження виконано відповідно до принципів Гельсінської декларації. Протокол дослідження ухвалено Локальним етичним комітетом усіх зазначених у роботі установ. На проведення досліджень отримано інформовану згоду пацієнтів.

Автори заявляють про відсутність конфлікту інтересів.

Ключові слова: геморой, анальна тріщина, лазерна допплерна флоуметрія, трансанальна гемороїдальна деартеріалізація (ТГД), видалення тріщини.

Introduction

According to various data, combined diseases of rectum are present in 20–30% of patients who come to a proctologist, with a stable trend towards an increase in their number [4,8,10]. Diagnosis and selection of treatment methods for combined diseases of the rectum represent a complex and still not fully understood problem [1,4,6].

Hemorrhoids and anal fissure occupy the first and the third places, respectively, in terms of frequency of occurrence among proctological diseases. According to various literary sources, the combination of chronic hemorrhoids with anal fissure is present in 55–70% of patients [1,7].

When using surgical treatment for combined diseases of the rectum, the doctor always faces the question of whether to divide the surgical intervention into two sequential stages or to perform a simultaneous surgical intervention for the combined pathology, and in which cases one or the other should be done [1,11].

Unfortunately, most minimally invasive interventions (ligation, infrared coagulation, etc.) are not radical and, as a result, patients often have to repeatedly seek medical help for complains associated with hemorrhoids. At the same time, severe pain and a very long rehabilitation period after removal of hemorrhoidal nodes are a serious obstacle for patients and often become the main reason for refusing surgery. Transanal hemorrhoidal dearterialization has become an alternative to both classical and minimally invasive interventions used to treat hemorrhoids, as it is both radical and minimally invasive at the same time. The essence of the method is to minimize trauma and reduce excessive blood supply to hemorrhoidal tissue [2,11,13].

Simultaneous surgical treatment of hemorrhoids and anal fissure increases the intensity of pain in the postoperative period, the patient's stay in the hospital, wound healing time, and increases the risk of postoperative wound infection, bleeding, incontinence, and stenosis [3,5,13].

Thus, the search for an optimal method of treating chronic hemorrhoids in combination with anal fissure remains relevant for both patients and proctologists.

Purpose of the study – to improve the results of treatment for patients with anal fissure in combination with chronic hemorrhoids by combining fissurectomy with transanal hemorrhoidal dearterialization.

Materials and methods of the study

A retrospective comparative analysis was conducted on the results of surgical treatment of 177 patients with chronic anal fissure located at the 6 o'clock position and chronic hemorrhoids stage II–IV. The study included 83 (45%) men and 94 (55%) women aged 19 to 75 years, with a mean age of 41±7.5 (M±σ) years. All patients underwent surgery in Kiev Regional Clinical Hospital at the department of proctology in 2010–2013.

Depending on the method of surgical treatment, patients were divided into three age- and gender-matched groups. The Group I consisted of 60 patients (28 men, 32 women, mean age 41.6±7.2 years) who underwent Milligan–Morgan hemorrhoidectomy, removal of the anal fissure, posterior dosed sphincterotomy in 2010. The Group II consisted of 60 patients (29 men, 31 women, mean age 39.4±6.8 years) who were operated for anal fissure without intervention for hemorrhoids in 2013. The Group III consisted of 57 patients (26 men, 31 women, mean age 41.3±7.1 years) who underwent surgery for anal fissure and hemorrhoids using an original technique in 2013.

The essence of the original technique (Ukrainian patent for invention No. 120318 dated 11.11.2019) is as follows. The anal fissure is excised within healthy tissues, the mucous membrane of the anal canal is mobilized, a dosed sphincterotomy is performed, and the defect of the mucous membrane is sutured; under the control of a Doppler sensor, the terminal branches of a. rectalis superior at 1, 3, 5, 7, 9, and 11 o'clock positions are ligated, and if necessary, additional pexia of hemorrhoidal nodes is performed. Thus, the defect of the mucous membrane of the anal canal and the sphincter spasm are simultaneously eliminated, blood flow in the area of the previous fissure is improved, and the blood supply to the cavernous tissue of the hemorrhoidal nodes is reduced. As a result, the hemorrhoidal nodes decrease in size, recede, and no longer bother the patient, remaining in their physiological location with minimal trauma done to the anal canal.

In order to assess the intensity of blood flow and microcirculation in the area of the tissues affected by anal fissure, laser Doppler flowmetry [9,12] was performed on all patients in the Group II and III before the surgery, at 3 weeks, 3 months, and 1 year after the surgery.

All measurements were taken without prior bowel preparation with the patient lying on their left side with their legs bent at a 90-degree angle at the hip and knee joints. The examination room was maintained at a constant temperature of 22°C. To avoid excessive pressure and occlusion of the underlying tissues, all measurements were taken by a single physician on the anoderma in the 6 o'clock position. During the measurement, the probe was held by the physician manually.

The assessment of treatment outcomes in patients was based on the following criteria: pain intensity, urinary retention in early postoperative period, postoperative wound suppuration, disease recurrence, iatrogenic incontinence, duration of postoperative hospital stay.

Postoperative pain intensity was assessed using a Visual Analog Scale every 6 hours in the first day after surgery, and the mean value of four assessments was recorded in the table.

Patients who had no urination in the first 6–8 hours after the surgery and had a painful and tense bladder on palpation were catheterized with a Foley urinary catheter, and the case was registered as urinary retention in the early postoperative period.

In the first 3–5 days after surgery, some patients experienced submucosal anal abscess, which was interpreted as postoperative wound suppuration.

Patients who had prolapse of hemorrhoidal nodes, bleeding and pain in the anal canal, presence of enlarged hemorrhoidal nodes and/or anal fissure during visual examination 6–12 months after the surgery were considered to be cases of disease recurrence.

Patients who complained of difficulties in gas and stool retention 6–12 months after the surgery, underwent sphincterometry using the Aminiev apparatus. Patients whose voluntary pressure was below 200 g and involuntary pressure was below 150 g were registered as cases of iatrogenic incontinence.

Statistics. Qualitative parameters are presented as the absolute number of cases (n) and their percentage (%). Comparison of these parameters between groups was performed using the Pearson's χ^2 test (for assessing the comparability of distributions in groups based on basic demographic and clinical characteristics) and the Fisher's exact test for small sample sizes (for treatment outcomes and complication rates).

For quantitative variables, the Shapiro–Wilk test was used to assess their normality on a preliminary stage. Descriptive statistics were presented as mean (M) and standard deviation (σ). Intergroup comparisons were made using the t-test and paired t-test to compare indicators over time if the data were normally distributed. If not, non-parametric statistics such as the Mann–Whitney test and the Wilcoxon test were used. The evaluation of results was carried out with a maximum error level of 5% ($p<0.05$).

Statistical analysis was conducted using the licensed version of the STATA 12.1 statistical package.

Results

Treatment outcomes for patients who took part in the study are presented in table 1.

Table 2 presents the results of Laser Doppler Flowmetry, which was conducted to assess the blood flow and microcirculation in the area of anal fissure tissues in the Group II and III.

As seen from Table 1, the best treatment results were achieved in the Group III, where simultaneous removal of anal fissure and transanal hemorrhoidal dearterializa-

Table 1
Treatment outcomes

Indicators	Group I	Group II	Group III	PIII-I	PIII-II
Pain intensity, (points, M±σ)	8±1	6±2	4±1	0.006* (1)	0.373 (1)
Postoperative hospital stay, (days, M±σ)	6±1.2	4±1.3	3±1.1	0.068 (1)	0.558 (1)
Urinary retention, n (%)	19 (31.7%)	8 (13.3%)	6 (10.5%)	0.004* (2)	0.644 (2)
Wound suppuration, n (%)	5 (8.3%)	1 (1.7%)	1 (1.8%)	0.104 (2)	0.999 (2)
Incontinence, n (%)	4 (6.7%)	1 (1.7%)	0	–	–
Fissure recurrence, n (%)	5 (8.3%)	2 (3.3%)	1 (1.8%)	0.104 (2)	0.593 (2)
Hemorrhoid recurrence, n (%)	6 (10%)	–	2 (3.5%)	0.161 (2)	–
All complications, n (%)	39 (65.0%)	12 (20.0)	10 (17.5%)	0.0001* (2)	0.734 (2)
OR (95% CI)	OR_{III-II}=0.85 (0.29–2.4)			–	0.734 (2)
	OR_{III-I}=0.12 (0.04–0.29)			0.0001* (2)	–

Notes: p_{III-I}; p_{III-II} – assessment of the statistical significance of the difference between the III and I, III and II groups * – p<0.05, the difference is statistically significant, (1) – Mann–Whitney test, (2) – Fisher's criterion; OR (95% CI) – odds ratio and 95% confidence interval.

Table 2
Blood flow intensity (M±σ)

Group	Prior to surgery (mV)	3 weeks after surgery (mV)	3 months after surgery (mV)	1 year after surgery (mV)
Group II	421±103	824±98*	706±112*	701±99*
Group III	415±102	830±101*	696±110*	700±100*

Note: * – the difference is statistically significant (p<0.05) compared to the period before the surgery (paired t-test).

tion were performed. By minimizing the surgical trauma of the anal canal, we were able to achieve a reduction in swelling of the operated anatomical structures. This, in turn, leads to improved trophism of the operated tissues, accelerates wound healing, patient rehabilitation, and their return to usual lifestyle.

Thus, in the early postoperative period, we were able to reduce the pain intensity from 8±1 points in the Group I to 4±1 points in the Group III (p=0.006), reduce the urinary retention from 31.7% in the Group I to 10.5% in the Group III (p=0.004). Wound suppuration (anal abscess), which occurred in 8.3% of patients in the Group I on days 3–5 after surgery, was reduced to 1.7% in the Group III (p=0.104). This is comparable to results obtained in surgical treatment for anal fissure alone (without hemorrhoids) in the Group II. Patients in the Group III stayed in the hospital for 3±1.1 days after the surgery, which is comparable to the result obtained in the Group II (4±1.3 days) and significantly less than in the Group I (6±1.2 days).

Distant results. In Group III, the frequency of recurrence of anal fissures was reduced to 1 (1.7%), and hemorrhoids to 2 (3.5%), compared to 5 (8.3%) and 6 (10%) in the Group I. The recurrence of anal fissures in one patient of the Group III was eliminated conservatively. In the Group I, four patients with recurrent anal fissures had to undergo repeat surgery, and in one case it was eliminated conservatively. In both patients of the Group III with recurrent hemorrhoids it was eliminated by vacuum ligation of one node. The Group I had two patients with recurrent hemorrhoids where it was possible to eliminate the complication by vacuum ligation of two nodes, and four patients underwent repeat hemorrhoidectomy. We did not observe any cases of iatrogenic incontinence in patients in the Group III, compared to 6.7% and 1.7% in the Groups I and II. Also, there were no postoperative strictures of the anal canal in the Groups III and II, unlike the Group I, where strictures occurred in 5 (8.3%) patients. Results of surgical treatment where statistically similar for both sexes. The overall assessment of complication frequency indicates a significant reduction in the relative risk of complications (by 88%) in the Group III compared to the Group I – OR=0.12 (0.04–0.29), p=0.0001, and a tendency to complication risk reduction by 15% compared to the Group II – OR=0.85 (0.29–2.4), p=0.734.

It is worth noting that patients in the Group II required repeat surgery for hemorrhoids, which signifi-

cantly increases trauma to the anal canal and increases the likelihood of postoperative complications.

Blood flow intensity measurements in patients of Groups II and III showed comparable results during the observation period. Thus, surgical treatment for anal fissures by the method described above helps improve blood flow, and simultaneous transanal hemorrhoidal dearterialization for chronic hemorrhoids does not worsen blood flow in the anal canal area. This is convincingly proven by performing flowmetry in patients in the pre- and postoperative periods. At the same time, it is possible to achieve hemorrhoidal node reduction and decrease of hemorrhoid-associated symptoms. While nodes remain in their physiological location.

Conclusions

Surgical treatment of patients with a combination of anal fissure and hemorrhoids by excision of the fissure in combination with transanal hemorrhoidal dearterialization gives improvement of treatment outcomes compared to fissure removal with or without hemorrhoidectomy.

The length of postoperative hospital stay was reduced to 3±1.1 days. The postoperative pain intensity decreased to 4±1 points. Urinary retention in the early postoperative period occurred only in 6 (10.5%) patients. Postoperative wound suppuration was registered only in 1 (1.8%) patient, recurrence of anal fissure in 1 (1.8%) patient, recurrence of hemorrhoids in 2 (3.5%) patients, and cases of iatrogenic incontinence were not registered.

Using laser Doppler flowmetry, it was shown that the proposed method helps to improve the intensity of blood flow in the area of anal fissure from 415±102 mV before surgery to 830±101 mV after 3 weeks, 696±110 mV after 3 months, and 700±100 mV after 1 year after surgery. This is comparable to the results obtained with intervention only for the fissure without simultaneous treatment for hemorrhoids.

Thus, the proposed method is both minimally invasive and radical and can be recommended for implementation in surgical practice.

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