# Rectal Fistulas: Current State of the Problem, Directions of Surgical Treatment

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## Abstract

Based on the literature data, an analysis of the current state of the problem of rectal fistulas is carried out in a comparative aspect: the causes of their occurrence, classification, and effectiveness of existing surgical treatment methods. The text database of medical and biological publications PubMed (based on the section "biotechnology" of the National Library of Medicine of the USA) was used through NCBI-Entrez access. The analysis of more than 450 sources of special medical literature was carried out. Despite the presence of a huge number of techniques, both invasive, characterized by a high incidence of incontinence, and minimally invasive, the use of which is associated with a high risk of recurrence, ambiguous (diverse) indicators of their effectiveness indicate that still the problem of rectal fistula and requires further search for more effective treatment methods.

*Keywords: Rectal Fistulas; Anal Fistula; Chronic Paraproctitis; Infectious-Inflammatory Process*

## Introduction

Rectal fistula (anal fistula, chronic paraproctitis) is a chronic phase of an infectious-inflammatory process that has developed in the anal crypt, intersphincteric space and pararectal, characterized by the formation of a fistulous tract connecting the lumen of the rectum with the external environment or ending blindly in the wall of the rectum or pararectal tissues [1]. The incidence of this pathology averages 2 people per 10,000 population per year [1]. The prevalence of rectal fistula is 10 per 100,000 people [2]. The latter predominantly develop in people of the most working age from 30 to 50 years, which determines their high social significance. The frequency of occurrence in men and women averages 2:1 [3].

Currently, there is no uniform approach to the treatment of rectal fistulas, and there are no clear indications for the use of any method of surgical treatment. And, if Gabriel's operation allows to achieve a high level of treatment effectiveness in a significant percentage of patients with fistulas involving less than 30% of the internal part of the sphincter, then high transsphincteric and extrasphincteric fistulas still pose a problem today, due to the low level of effectiveness of the minimally invasive techniques used, such as the introduction of fistula obturators (fibrin glue, collagen fistula plug), stromal fat cells and plasma with platelets, the use of a rectal mucosal flap, the use of laser technologies, and a significant risk of incontinence when using more invasive treatments such as fistulectomy and seton placement.

## Purpose of the Study

On the basis of literature data, to analyze the current state of the issue regarding rectal fistulas, the reasons for their development, with an assessment of the effectiveness of existing methods of their surgical treatment.

## Materials and Methods

According to world literature, the current state of the problem of chronic paraproctitis is assessed in a comparative aspect, the main results of the use and effectiveness of modern therapeutic technologies for the treatment of rectal fistulas in medical institutions at various levels are analyzed. The text database of medical and biological publications PubMed (based on the "biotechnology" section of the US National Library of Medicine) through NCBI-Entrez access was used. An analysis of more than 450 sources of specialized medical literature was carried out.

## Results and Discussion

In a normal anal canal there are usually 6 (range 3 - 10) anal glands, which are distributed fairly evenly and circumferentially at the level of the dentate line. The glands communicate with the anal canal through crypts or ducts, although up to half of all crypts do not have glands within them [4]. Eighty percent of the anal glands are located in the submucosal region and the remaining 20% can penetrate the internal sphincter, and rarely penetrate the external sphincter. The anal glands with their corresponding branching crypts are lined with stratified columnar epithelium, permeated with goblet cells that secrete mucus. Anal glands and ducts are usually surrounded by small to moderate numbers of lymphocytes [5]. In 1880 G.D. Herrmann and L. Desfosses proposed a cryptoglandular theory of the development of rectal fistulas. Its essence was that some cases of rectal fistula can be caused by the penetration of inflammation of the anal glands through the rectal mucosa into the perianal region [6].

A. Parks., et al. (1961) examined 30 samples of fistulas and found that 8 fistulas were associated with cystic dilatation of the anal glands, 13 of which were lined with transition zone epithelium, similar to the epithelium of the dentate line in the anal canal, while in 7 samples anal glands were present glands, which, however, were not part of the fistula tract. Based on this evidence, he concluded that infected anal glands were the cause of perirectal fistulas in more than 90% of cases. The cryptoglandular theory is now widely accepted, although it has been challenged in several studies [4].

T. Toyonaga., et al. (2007) (n = 514) cultured pus from anorectal abscesses in 80 patients and found that the main causative agents of anorectal abscesses are microorganisms of intestinal origin, such as Escherichia coli and intestinal-specific bacteroids (88.7%) [7].

According to morphological studies, most of the anal glands are localized in the intersphincteric space, where the formation of a primary inflammatory focus occurs, followed by the spread of inflammation to one or another cellular space and the development of acute paraproctitis [8].

Mucosal cells and the intestinal immune system provide protection against microbial flora and pathogens through various mechanisms. There are physical barriers including tight junctions and mucin, in addition to biological barriers including antimicrobial peptides, IgA antibodies, and mucosal associated lymphoid tissue. When the immune system recognizes a pathogen, a proinflammatory response is initiated by the host and mediated by cytokines and chemokines. Although bacteria themselves are largely absent in chronic anal fistulas, bacterial components may still play a role in the maintenance of persistent fistula disease. In one small pilot study, peptidoglycan, a component of the bacterial cell wall, was found in 9 of 10 anal fistulas studied [9].

There are several studies showing that chronic anal fistulas express high levels of certain proinflammatory cytokines, but whether or how they influence healing is unknown. K. Kiehne., et al. in their study compared the levels of cytokines and antimicrobial peptides

in fistula tissue not affected by Crohn's disease, perianal skin and normal rectal mucosa and found that fistulas expressed high levels of antimicrobial defensins. In addition, they found that the distal fistula strongly expresses IL-1b and proximal IL-8, both proinflammatory cytokines [10].

R.S. van Onkelen., *et al*. used immunohistochemistry to quantify the expression of 8 cytokines in the distal fistula tract in 27 patients undergoing sphincter-sparing surgery. They found that their representatives expressed 4 pro-inflammatory cytokines: IL-1b (93%), IL-8 (70%), IL-12p40 (33%) and TNF-a (30%). However, they were unable to correlate differences in cytokine expression with clinical outcomes [11].

The exact mechanism of breakdown of physical and immunological barriers in the development of rectal fistula is unknown, but there is evidence that it may be caused by the process of epithelial to mesenchymal transition (EMT), allowing intestinal epithelial cells to penetrate into the deep layers of the mucosa and intestinal wall, causing damage. This process is triggered by lipopolysaccharide (LPS), which, being an endotoxin, causes a decrease in the expression of E-cadgenin, a protein responsible for the lateral adhesion of epithelial cells, and an increase in mesenchymal migration markers (vimentin) [12].

In 1995, P.J. Lunniss., *et al*. analyzed the mucosa of the fistulous tract of the intersphincteric component in 18 fistulectomy specimens and found stratified squamous epithelium in 5 specimens, transition zone epithelium in 7, mixed squamous and columnar epithelium in 1, and absence of epithelium in 5. Although the authors did not indicate the extent of the influence of epithelialization on clinical outcomes, they hypothesized that high levels of epithelialization may lead to a higher rate of treatment failure [13].

In a study by L.E. Mitalas., *et al*. analyzed 44 samples of fistulas that were treated using a rectal mucosal flap. The authors reported epithelialization in 11 (25%) and found that the presence of an epithelial lining did not influence healing outcomes [14].

F. Seow-Choen., *et al*. cultured granulation tissue from fistula curettage specimens obtained from 18 patients with anal fistulas, excluding patients with inflammatory bowel disease and acute suppuration. They found small numbers of bacteria, with the most common types being enteric organisms: *E. coli* (22%), *B. fragilis* (20%) and *Enterococcus* (16%). Based on these results, they concluded that chronic inflammation in anal fistulas appears to be maintained neither by excessive numbers of organisms nor by rare microorganisms [15].

D. Wang., *et al*. analyzed 1342 patients with rectal fistula and identified several both modifiable and non-modifiable risk factors for the development of the disease, including: body mass index greater than 25 kg/m$^2$, high daily salt intake, diabetes mellitus, hyperlipidemia, dermatosis, previous rectal surgery, smoking and alcohol consumption, sedentary lifestyle, excessive consumption of spicy/fatty foods, infrequent exercise and prolonged sitting on the toilet to defecate [16].

About 95% of patients with rectal fistulas associate the onset of the disease with acute paraproctitis or the appearance of painful swelling in the anus [17].

Most often, rectal fistulas develop as a result of a previous abscess. Moreover, in approximately a third of patients with anorectal abscess, a concomitant fistula is detected at the time of examination. Patients with recurrent anorectal abscesses are even more likely to have a concomitant fistula [18-21].

Anal fistulas were first classified in 1976 by A.G. Parks., *et al*. According to this classification, intrasphincteric, transsphincteric, supralevator and extrasphincteric fistulas were distinguished [22].

J. Morris., *et al*. (2000) first described the classification of SJUH based on MRI (magnetic resonance imaging) results. Fistulas of the 1$^{st}$ degree are "simple linear intersphincteric fistulas", which coincides with the "intersphincteric" classification of A.G. Parks. A fistula

of the 1st degree with the presence of an accompanying abscess or an additional fistula tract is a fistula of the 2nd degree. Passage of the external sphincter indicates the presence of a grade 3 fistula, which is also known as a transsphincteric fistula. A transsphincteric fistula with an abscess or accessory tract in the ischiorectal fossa is classified as grade IV. In contrast, a supralevator or transsphincteric fistula is designated as grade V. This classification, based on pelvic MRI findings, provides an objective preoperative assessment for the surgeon. The diagnostic use of MRI image classification is more predictive of surgical outcome than the results of intraoperative diagnostics [23].

There is also a classification proposed by the American Gastroenterological Association (SPTF). In this classification, fistulas were divided into 2 large groups. Group 1 included simple fistulas (in which fistulotomy is possible without the risk of incontinence), in which the fistula affects less than one third of the sphincter. Group 2 included complex fistulas (in which fistulotomy is associated with a high risk of incontinence). These include high fistula, supralevator fistula, fistula with multiple tracts, horseshoe tracts, anterior fistula in women and fistula with associated abscess, Crohn's disease, malignancies and existing urinary disorders. However, this classification was not based on patient data and was therefore not very accurate. Subsequent validation of this classification in patient data showed that a third of fistulas classified as complex were in fact simple and could be safely treated with fistulotomy [4]. This classification reflects an overly simplistic view of a disease that is so diverse and variable [24].

P. Garg (2017) presented a new classification, where fistulas are grade 1 - 2 (low linear intrasphincteric, low linear transsphincteric; intrasphincteric and transsphincteric fistulas, involving less than 1/3 of the sphincter with an abscess, multiple tracts, horseshoe-shaped; complete intrasphincteric supralevator fistula, low transsphincteric fistula with intrasphincteric supralevator extension) are simple fistulas and can be safely repaired by fistulotomy without any risk of incontinence, while grades 3-5 (high linear transsphincteric fistula, fistula with concomitant Crohn's disease, sphincter damage, after radiation or anterior fistula in a woman, high transsphincteric fistula with an abscess, multiple tracts or horseshoe tracts, high transsphincteric fistula with supralevator leakage, suprasphincteric or extrasphincteric fistula) are complex fistulas, and for such fistulas one should not even attempt to perform a fistulotomy. This classification provides much more relevant information to the operating surgeon [25].

The incidence of rectal fistulas varies according to the literature. Yu. A. Shelygin (2012) provides the following data: intrasphincteric fistulas - 30%, transsphincteric fistulas - 45%, extrasphincteric fistulas - 20% [1].

At the same time, P. Sileri provides the following data: intrasphincteric fistulas - 26.2%, transsphincteric fistulas - 68.8%, extrasphincteric fistulas - 1.8% [19].

A classification is also used depending on the complexity of the fistula: Grade I means that the internal fistula opening is narrow, there are no scars around it, no abscesses or infiltrates in the tissue, and the course is fairly straight. Grade II includes fistulas in the area of the internal opening of which there are scars, but there are no inflammatory changes in the tissue. Grade III includes fistulas with a narrow internal opening and in the absence of scarring around, with the presence of a purulent-inflammatory process in the tissue. With IV degree of complexity, there is a wide internal fistula opening, which is surrounded by scars, and the presence of purulent inflammation is also observed [26].

S. García-Botello., *et al*. (2021) conducted a study including 49 patients (37 men and 12 women, mean age 49 years) with rectal fistula. All patients underwent fistulotomy followed by assessment of anal continence. If less than 50% of the external anal sphincter was damaged during surgery, the authors experienced dysfunction of holding the anal sphincter in only 8 of 33 patients (24.2%), but if more than 50% of the external anal sphincter was damaged in 5 of 8 patients (62.8%) there was a deterioration in holding function [27].

J. Maqbool., *et al*. (2022) conducted a study in which 124 patients took part (male to female ratio 8.5:1, mean age 38.2 years). Fistulectomy was performed in 90 (72.5%) patients. Anal sphincter continence function was assessed using the Cleveland Clinic Incontinence Scale

(CCIS). Impaired holding function at 18 months (both mild and moderate) was observed in 10 of 124 (8.1%) patients. 16 of 124 (12.9%) patients experienced relapse. Among the 8 patients who developed incontinence after surgery, 7 had mild and 1 patient had moderate anal incontinence at 12 months of follow-up [28].

P. Awad., *et al*. (2023) conducted a study in which 80 patients with high transsphincteric fistulas of the rectum (55 men and 25 women) took part. The patients were randomly distributed into 2 groups of 40 people each (average age was 46.65 ± 6.6 and 45.85 ± 6.07 in groups 1 and 2, respectively). In group 1, LIFT surgery was performed. In group 2, fistulectomy and primary sphincteroplasty were performed. The average wound healing time was faster in group 1, 4.67 ± 0.916 weeks, and the average in group 2 was 6.05 ± 0.95 weeks. In group I, there were no cases of impaired holding function. There were 6 (15%) cases of gas incontinence, assessed by Wexner scale 3/20. Relapse during one year of observation occurred in 13 (32.5%) patients of group 1. While in group 2, relapse occurred in 1 (2.5%) patient [29].

R. D. Ritchie., *et al*. (2008) conducted a meta-analysis, the purpose of which was to evaluate the incidence of anal incontinence after treatment of rectal fistula with seton. The following materials were used in various studies: surgical suture material, rubber bands, rubber gloves, drains. Various methods for tightening the seton have been reported, including knots and rubber bands. The length of time between pull-ups varied greatly from article to article. According to global data, incontinence develops in 12% of patients (180 out of 1460), but the author points out that in some studies this figure reached 32% [30].

A. Ali., *et al*. (2022) conducted a study with 72 patients (50 men (70%) and 22 women (30%)) diagnosed with high transsphincteric anal fistula. A size 2 silk thread was used as the seton. All patients underwent a seton tightening session every 2 weeks until complete removal of the seton was achieved. Forty-eight patients (66.7%) required two seton lift treatments within 30 days, while 24 patients (33.3%) required three sessions over 45 days. Fecal incontinence was observed in 1 patient. Fistula recurrence was observed in two (2.8%) patients after 6 months of follow-up. Primary recovery was achieved in 62 (90.3%) patients within 60 days. The remaining seven (9.7%) patients required more than 60 days to heal [31].

I.S. Anosov (2017), S.H. Emile., *et al*. (2019), in their work devoted to the treatment of rectal fistulas using the method of ligation in the intersphincteric space (LIFT), analyzed the results of treatment of 50 patients (34 men and 16 women, average age 42.7 years) with transsphincteric fistulas involving the superficial and /or a deep portion of the external sphincter, as well as with extrasphincteric fistulas of the rectum. In 25 (50%) cases, no leaks or branches of the fistula tract were noted. Recovery was noted in 37 patients (74%), relapse of the disease - in 13 (26%) [32,33].

P. Meinero., *et al*. (2011), S. Emile., *et al*. (2018) conducted a study that included 136 patients (71 men and 27 women, average age 42 years) with rectal fistulas. The authors used the video-assisted fistula treatment (VAAFT). All patients were discharged on the day of surgery. Primary healing was achieved in 72 patients (73.5%) within 2 - 3 months after surgery. In 26 patients (26.5%) wound healing was not observed. Nineteen of 26 underwent reoperation using VAAFT. Nine of the 19 patients reoperated with VAAFT were cured, while 6 relapsed. All patients denied deterioration in the function of holding intestinal contents [34,35].

P. Garg (2017) conducted a study in which 61 patients (36 men and 24 women, average age was 42.3 ± 9.5 years) with complex rectal fistulas took part. The author used the TROPIS operation. The fistula healed completely in 84.6% (44/52) of patients and did not heal in 15.4% (9/52) of patients. All patients were discharged from the hospital within 24 hours of admission. There were no significant changes in objective measures of holding function. Indicators of impaired holding function before surgery were 0.19 ± 0.4, and after 3 months they were 0.32 ± 0.6. There were no serious complications of the procedure [36].

B. Huang and co-authors (2021) conducted a study in which 48 patients took part (41 men and 7 women, mean age 40 ± 11.7 years). The inclusion criteria for the study were: complex rectal fistula, horseshoe fistula, supralevator fistula. Patients underwent TROPIS

surgery. Of the 48 patients, the fistula healed completely in 87.5% (42), in 4 (8.3%) it did not heal, and in 2 (4.2%) there was a relapse. The average time for complete healing was 7.24 ± 1 weeks. The Wexner fecal incontinence score, resting anal pressure, and maximum anal pressure during sphincter contraction before and after surgery showed no significant difference (p > 0.05) compared with 6 months after surgery [37].

The first study that described the use of fibrin glue was performed by A. Hjortrup., *et al*. in 1991. The observation group consisted of 23 patients (14 men and 9 women; average age was 55 years). It is believed that the mechanism of action is to stimulate the growth of fibroblasts and pluripotent endothelial cells in the fistula tract to seal it. These cells then produce collagen and extracellular matrix during the wound healing process. In 12 patients (52%), the fistula closed completely after one attempt; follow-up period ranged from 12 to 26 months. The fistula recurred in 11 (42%) patients. Five patients managed to achieve recovery after two or three repeated attempts to use fibrin glue. Six fistulas did not heal after three attempts to apply glue [38].

As I. Lindsey and co-authors (2002) showed in a randomized study, patients who were injected with fibrin glue did not suffer from any form of incontinence, while in the group treated with conventional surgical methods, incontinence of varying degrees of severity was observed. Poor results with fibrin glue may be explained by the inability of the resulting adhesive clot to properly seal the fistula tract due to its thin consistency [39].

In his review, M.T. Swinscoe., *et al*. (2005) observed that shorter fistulas (< 4 cm) tended to recur more frequently than longer fistulas (> 4 cm), with a rate of 54% versus 11%, respectively. At the same time, the authors noted that assessment of long-term results is very important when using fibrin glue. A possible explanation is that shorter fistulas do not retain adhesive as well as longer ones [40].

In 2012 M.D. Herreros., *et al*. conducted a study that included 200 patients with cryptoglandular rectal fistulas. Treatment was carried out using autologous adipose tissue-derived stem cells (ASC) in group 1, ASC in combination with fibrin glue in group 2, and fibrin glue alone in group 3. Treatment success was reported in 57.1% in group 1 (ASC), 52.4% in group 2 (ASC + fibrin glue) and 7.3% in group 3 (fibrin glue) (p = 0.13) [41,42].

The use of ASCs has been compared not only with fibrin glue, but also with other surgical techniques, such as closure of the internal fistula with rectal flaps. Y. Zhang., *et al*. (2020) conducted a study that compared the use of ASCs and rectal flap in 24 patients (20 men and 4 women, mean age 35.73 ± 7.54) with transsphincteric and extrasphincteric rectal fistulas. The authors reported similar effectiveness rates of the techniques (54.55 vs. 53.85%). However, no deterioration in holding function was observed in patients [43].

Z. Balciscueta., *et al*. (2017) conducted a meta-analysis of literature data on the use of a rectal flap for the treatment of complex cryptoglandular anal fistulas. A total of 1655 patients were included. Of the total number of patients (1655), 663 patients received a mucosal flap, 768 patients received a partial-thickness flap, and 224 patients received a full-thickness flap. Twelve studies performed fistulectomy, 7 curettage, 3 studies used both methods, and 4 studies did not know the procedure. The operation in all studies was supplemented by closing the internal opening with a rectal flap. The overall relapse rate was 21% and ranged from 0 to 47.2%. The overall recurrence rate for mucosal flaps was 26.7%, for partial thickness flaps it was 22.9%, and for full thickness flaps it was 7.4%. The overall incidence of fecal incontinence was 13.3% and ranged from 0 to 51% [44].

P. Giamundo., *et al*. (2014) conducted a study in which 35 patients took part (20 men and 15 women, average age 48 years). The authors used FiLAC surgery to treat patients. A diode laser was used (wavelength 1470 nm, power 10 W). The internal fistula opening was not sutured. The overall success rate at a median follow-up of 20 (3 - 36) months was 71.4% (25/35) of patients. Two recurrences were

reported at 3 and 6 months postoperatively, both of which were successfully treated with fistulectomy. In 8 patients whose procedure was considered unsuccessful, discomfort and discharge from the external opening did not disappear after surgery [45].

H. Elfeki and co-authors (2020) conducted a meta-analysis of data on the results of treating patients with rectal fistulas using laser. 7 studies were selected, with a total of 454 patients (67.4% were men, mean age 43 years). The patients underwent FiLaC surgery. Three studies reported hospital stays of 1 day, while other studies reported that patients were hospitalized for 2 days. A total of 296 (65.2%) patients achieved recovery after FiLaC with a median follow-up of 23.7 months. While 158 (34.8%) patients experienced non-healing/relapse. The authors did not report any serious complications after surgery. The weighted average incidence of holding dysfunction was 1.0% [46].

S. Dango., *et al*. (2017) and co-authors conducted a study that involved 22 patients (19 men and 3 women, average age 53 years) with transsphincteric and intrasphincteric rectal fistulas. The authors used nitinol clips to close the internal fistula opening. Follow-up time was 36.9 months (range, 19 - 48 months). Follow-up revealed a relapse rate of 41% (9 patients). The remaining 13 patients (59%) experienced complete healing after clip placement. Time to relapse averaged 6.9 months (range, 3 - 11 months). The mean hospitalization time was 4.9 days (range, 2 - 9 days). The authors did not observe any incontinence after clip placement. There was also no spontaneous detachment of the clip, and no patient reported any significant discomfort. The clip was removed an average of 5.8 months after insertion (3 - 12 months) [47].

Y. Wang and co-authors (2020) conducted a study that assessed the results of treatment of 51 patients with transsphincteric and extrasphincteric rectal fistulas. The patients were divided into 2 groups. In group 1, a clipper with nitinol clips with shape memory was used to close the internal fistula opening. The authors clipped the area of the internal opening and then removed the external opening for drainage. In group 2, patients underwent closure of the internal fistula opening with a rectal flap. The frequency of fistula healing in groups 1 and 2 at week 6 was 48.0% (12/25) and 46.2% (12/26), respectively, with no significant differences between them (p = 1.0). At the 6th month there was a significant difference (p = 0.021) between the groups: in group 1 (92.0%, 23/25) and in group 2 (65.4%, 17/26). There was no significant difference in VAS pain scores and Wexner groin function scores between the two groups [48].

K. Göttgens., *et al*. (2016) conducted a study in which 25 patients took part (17 men and 8 women, average age 49 years). The authors used closure of the internal opening with a displaced mucosal flap in combination with injection of platelet-rich plasma (PRP) into the external fistula tract. All fistulas closed within 3 months after surgery. A total of 4 relapses were noted. The mean time from surgery to recurrence was 115.5 days (range 66-216). Two (8%) of these patients achieved recovery after a second identical procedure. One patient (4%) repeatedly developed an abscess in the fistula tract. One (4%) patient refused further treatment. No other complications were noted. The level of incontinence on the Marx scale averaged 3 points, which indicated that there was no deterioration in continence function in patients after surgery. (range 0 - 18) [49].

A. Abdollahi., *et al*. (2023) conducted a study that evaluated the effect of autologous platelet-rich plasma (PRP) and platelet-rich fibrin glue (PRP-FG) in the treatment of complex rectal fistulas. 10 patients (mean age 39.83 ± 8.17 years) with complex high rectal fistulas were included. After the last course of PRP-FG, patients were followed up for 10 to 84 months. There were no complications during or after the operation. Disappearance of symptoms was observed in 6 patients. In 4 patients the discharge did not stop. None of the patients had fecal incontinence [50].

Denisenko E.V., Denisenko V.L., Gain Yu. M., *et al*. (2023) conducted a single-center retrospective study; the inclusion criterion for patients was the presence of transsphincteric fistulas of the anus. Number of patients - 150 (first group - 50 patients, second group - 50

patients, third group - 50 patients). Patients underwent 3 types of surgical intervention. In the 1st (main) group, the fistula was treated using laser technology, in the 2nd group - excision of the fistula followed by a ligature, in the 3rd group - excision of the fistula followed by suturing of the sphincter. An analysis of the components of quality of life indicators (according to the SF-36 school), as well as differences in the frequency of relapses on the 180th day after surgery was carried out. It was found that the frequency of relapses when using laser technology does not significantly increase compared to control groups (p = 0.5). In the main group, 6 months after surgery, higher indicators of the physical health component (PH) (F = 11260.72 p = 0.001), as well as mental health (MH) (F = 10459.6 p = 0.001) were revealed. Treatment of anal fistula using laser technologies does not increase the frequency of relapses and improves the quality of life of patients compared to traditional methods [51].

## Conclusion

Modern analysis of the available literature allows us to establish the main causes of the development of the disease, determine existing and updated approaches to grading the severity of pathology and classifying the disease.

A significant number of methods for treating rectal fistulas and ambiguous (varied) indicators of their effectiveness most likely indicate that this problem is far from being resolved and needs to be developed, improved and a differentiated choice of surgical technologies for effective correction of the pathology.

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