

Features of Surgical Treatment of Anaerobic Paraproctitis

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Abstract: A study was conducted based on the analysis of the results of diagnosis and treatment of 124 patients with anaerobic paraproctitis. The main anaerobic pathogen was clostridial infection (41.1%). In 22.6% of patients, a polymicrobial etiology of the pathological process was noted. *Escherichia coli* was detected in 46.8% of cases. In 17.7%, involvement of the perineal muscle structures in the pathological process was noted. This category of patients was characterized by a particularly severe and aggressive course of the disease. The median area of the lesion was 160 cm², which required extensive operations to remove necrotic tissues. In the structure of postoperative complications, clinically significant (III - V degrees Clavien-Dindo), requiring repeated surgery or threatening the patient's life, occurred in 16.9% of patients. Mortality is 8.8%.

Keywords: Anaerobic Paraproctitis, Surgical Treatment.

Introduction

The level of development of the problem of anaerobic paraproctitis in world literature is quite high, however, it remains heterogeneous and largely debatable. Itzhak Brook's works made significant contributions to the study of the pathogenesis, microbiological features, and clinical course of anaerobic infections of soft tissues, which detailed the role of obligate anaerobes, their associations with aerobic flora, and the importance of timely antianaerobic therapy. Research by Dennis L. Stevens emphasizes the rapid progression of necrotizing forms of infection, the need for early aggressive surgical tactics, and comprehensive intensive treatment, which has direct relevance to severe forms of anaerobic paraproctitis.

According to research by various authors, in recent years in the literature of the CIS and Central Asian countries, the problem of anaerobic paraproctitis has been covered in a smaller volume and mainly in the form of clinical observations and generalized reviews. The works of G. I. Vorobyev and his school are devoted to the issues of surgical treatment of paraproctitis, classification of disease forms, and postoperative management of patients, however, the modern aspects of targeted antianaerobic therapy, staged rehabilitation, and intensive care are presented in fragments. In Uzbekistan, systematized studies devoted to anaerobic paraproctitis, taking into account local epidemiological, clinical-organizational, and resource characteristics, are rare, necessitating further in-depth study and the development of adapted modern treatment approaches.

Purpose of the study: To improve the treatment outcomes of patients with anaerobic paraproctitis.

Materials and Methods

From 2011 to 2025, a study was conducted in the coloproctology department of the multidisciplinary clinic of the Samarkand State Medical University, based on the analysis of the results of diagnostics and treatment of 124 patients with anaerobic paraproctitis (Table. 1).

Table 1. Characteristics of patients with AP.

Indicator	Result
Men/women n (%)	88 (70.9) /36 (29.1)
Median age, years (min-max)	52.9 (22-75)
Body mass index, Me (min-max), kg/m ²	25.1 (15.8 - 40).

Of the analyzed patients, 16 patients were admitted within 4 to 6 days of the onset of the clinical picture of AP, of whom more than half of the patients - 9 (56.2%) - had a severe or extremely severe condition. After 7 days and later from the onset of the disease, 8 patients were hospitalized, and in this group, the general condition was severe in 7 (78%) patients. In the structure of AP patients, men predominated - 88 (70.6%) versus 36 (29.1%) women. Due to clear gender differences, the gender factor was analyzed separately as a risk factor for mortality in this category of patients.

Out of 124 patients operated on in our department, 22 (17.7%) had perineal muscle structures involved in the pathological process. This category of patients was characterized by a particularly severe and aggressive course of the disease. The median area of the lesion was 160 cm², which required extensive operations to remove necrotic tissues.

The combined characteristics of the clinical manifestations of the disease are presented in Table 2.

Table 2. Characteristics of the depth and area of lesion in patients with AP.

Character	Indicator	n (%)
Depth of damage	Cellulose	102 (82.2%)
	Myositis	22 (17.7%)
Area of damage	Min - max	16-3000 cm ²

Most patients - 45 (36.3%) were hospitalized within 2-3 days of the onset of the disease. The longer the acute purulent process persists in the pararectal tissue, the wider it encompasses and destroys the surrounding tissues.

When analyzing the causes of late hospitalization, it was revealed that the vast majority of patients seek help only after independent attempts at conservative treatment - 118 (95.1%), less often - 6 (4.9%) - due to errors in the diagnosis of outpatient surgeons.

The connection of the abscess with the rectum was clearly established in 45 patients (36.2%). In 67 patients (54.1%), the wound or injuries communicated with the anal canal, more precisely, with its posterior wall. In 65 (52.4%) cases, this was a subcutaneous access - the probe was directed towards the anus and entered the intestinal lumen almost freely, under the skin, i.e., the fistula was intrasphincteric.

In 57 (45.9%) cases, the fistula course was directed almost parallel to the anus wall, and a thick layer of the sphincter tissue was found between it and the anus - a complex extravascular fistula was formed. Finger rectal examination was performed in all patients during the postoperative wound healing period. In 45 (36.2%) cases of wound contact with the anal canal, either an already formed internal opening of the purulent tract in the form of a slightly painful depression on the posterior wall of the anal canal was detected, or it was a painful, compacted area. The detection of an internal fistula opening or suspicion of it in most patients indicated that AP is a complicated form of conventional acute paraproctitis, not some separate specific nosology.

Nevertheless, in 38 (30.6%) cases, with the anterior localization of the abscess, it was impossible to immediately determine or subsequently suspect the connection of the wound to the rectum, and it is possible that in these cases, indeed, we are talking about Fourier's disease (gangrene).

Table 3. Composition of microflora in patients with acute anaerobic paraproctitis.

Microorganism	Detection frequency, n (%)
Clostridium	51 (41.1%)
Staphylococcus	6 (4.8%)
Streptococcus	7 (5.6%)
Proteus	11 (8.8%)
Escherichia	58 (46.8%)
Pseudomonas	2 (1.6%)
Actinomycetes	16 (12.9%)

Gram-negative flora was most frequently distinguished, among which *E. coli* predominated. *Escherichia coli* was detected in 46.8% of cases. The main anaerobic pathogen was clostridial infection (41.1%). At the same time, it is important to note that 28 (22.6%) patients had a polymicrobial etiology of the pathological process, Table. 3.

The formation of fistulas after surgery was observed between 6 and 12 months and was noted in 57 (45.9%) patients. Of these, 28 (49.1%) patients were successfully operated repeatedly at the clinic, and another 13 (22.8%) patients were operated on at their place of residence. Various degrees of anal sphincter insufficiency were observed in 19 (23.1%) patients in the long term after surgical treatment. They were prescribed conservative therapy (gymnastics of the anal sphincter and pelvic floor muscles), and in a number of cases, muscular electrostimulation was performed in parallel with therapeutic exercises in outpatient settings with a positive result.

The local signs of AP are quite similar to acute banal (vulgar) paraproctitis. A significant difference is the rate at which the disease spreads. In the area 2-4 cm from the anus, sometimes directly next to the transitional fold, a sharply painful inflammatory focus appears. Radial skin folds smooth out, the shape of the anus becomes asymmetrical. Later, skin hyperemia appears and fluctuation can be detected when pus spreads from the cellular spaces under the skin (Figure 1).

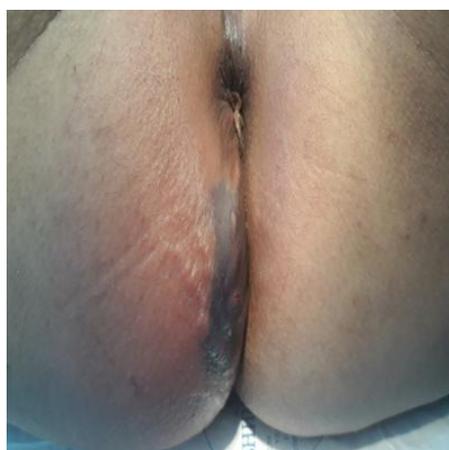


Figure 1. Local signs of anaerobic paraproctitis in patient P., 47 years old.

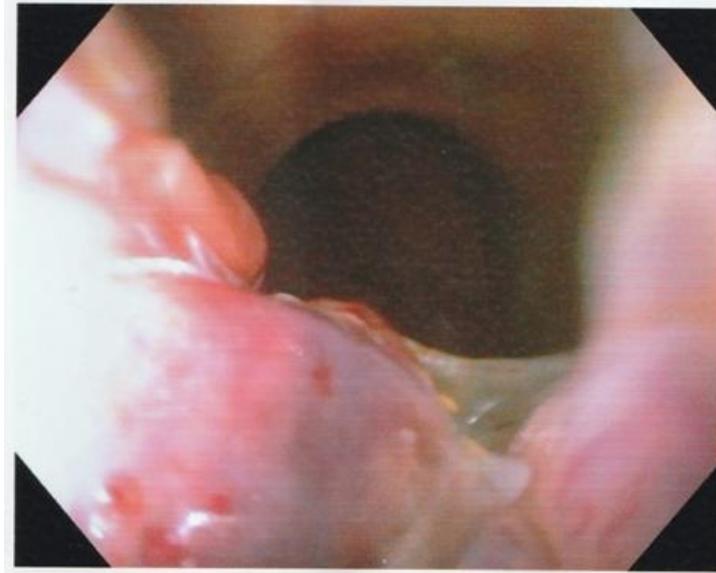


Figure 2. Patient P. 47 years old. RRS revealed infiltrative edema on the rectal posterior wall in anaerobic proctitis.

During rectomanoscopy, the mucous membrane in the area adjacent to the infiltrate was hyperemic, and the vascular pattern had a reticular structure. When the intestinal lumen was compressed by an infiltrate, the mucous membrane above it became smooth, the folds were absent, and the mucous membrane was pale. (Figure 2)

Ultrasound examination reveals tissue thickening with hyperechogenic foci with reverberation artifacts, causing "dirty" darkening due to gas accumulations (Figure 3).

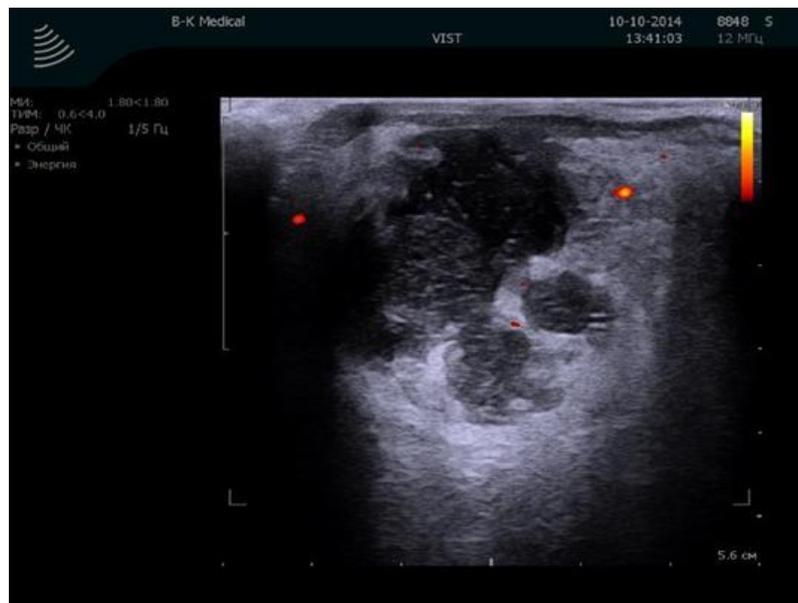


Figure 3. Ultrasonogram of patient S., 42 years old. Thickening of the tissue with hyperechogenic foci is visualized.



Figure 4. MR tomogram. Patient J., 63 years old. On the sagittal section, an asymmetrical thickening of the fascial sheath with fluid inclusions is visualized.

During computed tomography in patients with AP, pathognomonic signs of the anaerobic process can be visualized: asymmetrical thickening of the fascial sheath, fluid inclusions, thickening of adipose tissue, and subcutaneous emphysema (Fig. 4).

Results and Discussion

Surgical dissection of the anaerobic abscess of the perineum was performed only under intubation anesthesia or spinal anesthesia. This not only eliminated pain syndrome during traumatic intervention in severely ill patients, but also allowed for maintaining the ventilation regimen for the necessary postoperative period, which was necessary for the vast majority of patients. The duration of mechanical ventilation was determined not so much by the gas composition of the blood, but also by the restoration of water-electrolyte balance, normalization of metabolic indicators, and the clinical picture of decreased intoxication manifestations, which were necessarily controlled by the sum of points according to the SAPS system.

The intervention was carried out through a wide incision across the entire area of the identified inflammatory changes. This made it possible to conduct a thorough intraoperative revision with an assessment of the extent of soft tissue damage, assess the demarcation between visible damaged and healthy tissues, and identify possible pockets and drains that were drained at the end of the operation.

The essence of the operation itself consisted in the thorough total removal of all non-viable tissues, without limiting such actions, neither by the size nor the configuration of the resulting wound, since the main task at this moment was to save the patient's life. The criterion for the viability of the formed wound surface was the distinct capillary bleeding of tissues (Figure 5).

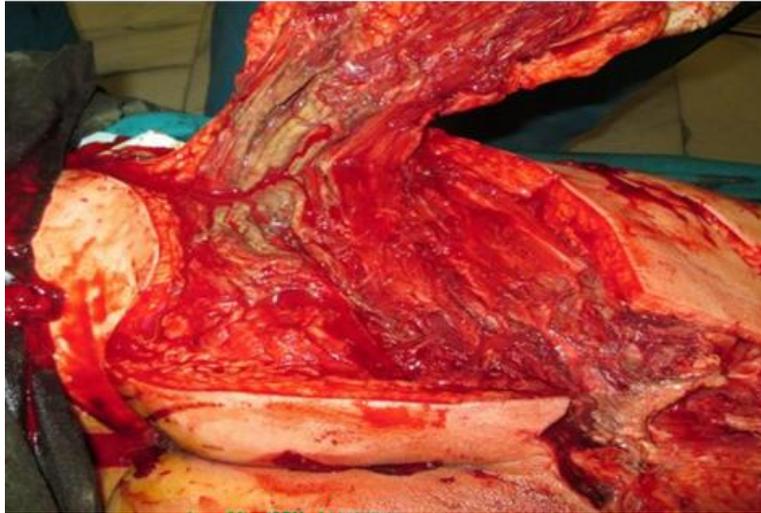


Figure 5. Patient D. 39 years old. Intraoperative photo of anaerobic paraproctitis involving necrectomy stage with right hip involvement.



Figure 6. Patient M., 61 years old. Intraoperative photo of the wound suturing stage with edge visualization.

As the final stage in questionable cases, the following technique was used in 22 (17.7%) patients: the edges of the wound were turned out, gauze balls were placed on them, and fixed to the intact skin, which allowed for good visual control (Figure 6).

Removal of small areas of lysed tissues during repeated bandaging occurred in 97 (78.2%) of 124 patients, and the elimination of newly formed purulent deposits of various localizations occurred in 48 (38.7%) patients. The general characteristics of the surgical treatment methods for anaerobic paraproctitis are presented in Table 4:

Table 4. Nature of surgical treatment of patients with anaerobic paraproctitis.

Nature of the operation	Number of primary operations	Number of repetitions in the intervention
Total necrectomy	124 (100,0%)	98 (79,0%)
Additional opening of purulent fistulas:	48 (38,7%)	4 (4,1%)
• In the perineum	21	-
• On the hip	13	1
• On the anterior abdominal wall	10	1
• Retroperitoneal space	6	2
• In the soft tissues of the genitals	3	2
• Abdominal cavity	1	1
• Colostomy.	1	-

The main task of radical intervention for any form of AP appears to be the single one - opening the perineal phlegmon and total removal of all non-viable tissues.

But with this, the surgical part of treatment did not end in most patients. In 98 (79.0%) patients, newly emerged necrotic foci were found during dressings in the first few days of the postoperative period, which were also removed by acute removal under general anesthesia and in "purulent" operating conditions.

In 48 (38.7%) patients, additional purulent fistulas were opened. At the same time, it is important to note that 7 patients were exposed to fistulas of several locations.

Complications of Clavien-Dindo I-II degree developed in 44 patients. However, considering the severity of the primary disease, the need to prescribe antipyretics, analgesics, and antibacterial therapy in all patients, these patients were excluded from the analysis of postoperative complications. In the first days of the postoperative period, the need to re-remove the formed small areas of lysed tissues during repeated bandaging arose in 97 (78.2%) of 124 patients. However, considering the nature of the disease, this aspect was not considered a deviation from the "normal" course of the postoperative period. Nevertheless, 9 (7.2%) had to perform repeated necrectomy, open additional fistulas, and remove lysed tissues in the operating room under general anesthesia.

Thus, in the structure of postoperative complications, clinically significant (III - V degrees Clavien-Dindo) postoperative complications requiring repeated surgery or threatening the patient's life occurred within 30 days in 21 (16.9%) patients. Structure of postoperative complications.

In 4 (3.2%) patients, the postoperative period was complicated by bleeding from the necrectomy zone, in the listed cases, the bleeding was stopped by suturing in the operating room.

Liver failure syndrome was noted in 8 patients (6.4%) and manifested as hyperbilirubinemia exceeding 20 $\mu\text{m/l}$ and the appearance of jaundice.

In 15 patients (12.1%), signs of decompensation of the pulmonary system were noted, which, against the background of the ongoing therapy, manifested as the development of tachypnea with the participation of accessory muscles. These patients required artificial lung ventilation in intensive care units.

Symptoms of renal failure in the postoperative period were noted in 6 (4.8%) patients with AP.

We considered an increase in creatinine levels above 130 $\mu\text{mol/L}$ as one of the first symptoms of renal dysfunction. In two cases, this category of patients required dialysis.

Of the 124 patients in the analyzed group, 11 (8.8%) patients died at the clinic. As mentioned above, these were extremely severe patients admitted with septic shock symptoms, and all measures taken in the intensive care unit proved ineffective. 8 patients in this group died from intoxication against the background of the progression of anaerobic paraproctitis with damage to the large cellular spaces of the pelvis, perineum, and scrotum.

In 1 case, the patient developed a myocardial infarction on the 6th day after surgery. In 2 patients, the lethal outcome occurred against the background of pulmonary artery thromboembolism.

The average duration of inpatient treatment of deceased patients was 33.8 days \pm 24 days (1-42 days).

Out of 124 patients, 81 (65.2%) were observed within 1 year after the first surgery. Pararectal fistulas occurred in 38 patients, as mentioned above, they were detected during the opening of the abscess or, most often, formed within the first month after surgery. In 20 patients, these were simple intra- and trans-sphincter fistulas, and in 18 - complex extra-sphincter fistulas.

Of the 20 patients with subcutaneous or transsceptor fistulas after the autopsy of acute anaerobic paraproctitis, 11 patients underwent surgery within 1 to 3 months of the first operation. The remaining 9 patients with transsphincteric fistulas were operated on 3 to 6 months after surgery. Before the operation, a bacteriological examination of the tissues from the remaining wound or the external opening of the fistula was performed, and the operation was performed only if the smear analysis for anaerobes was negative. There were no specific complications after these operations, wound healing after resection or incision of fistulas into the rectal cavity proceeded typically for ordinary, "banal" fistulas. It is important to note that, despite the absence of specific complications after these operations, the average bed-day in the group of patients operated on from 1 to 3 months was significantly higher than in the group with delayed operations (13 \pm 4.1 versus 9 \pm 3.6, respectively, $p = 0.046$).

In the remaining 18 patients, complex extravascular fistulas were formed in the coarse, dense, and scarred tissues at the site of the former large wounds of the perineum.

All patients in this group underwent surgery within 3-6 months after primary surgical treatment.

Recurrence of acute paraproctitis after dissection of anaerobic paraproctal pustules was observed in 4 (3.2%) patients.

After treatment of acute anaerobic paraproctitis, reconstructive-plastic surgeries to replace the skin flap were performed in 19 (15.3%) patients.

The duration of the plastic intervention ranged from 20 to 64 days from the initial surgery and averaged 43 \pm 17 days.

Conclusion

1. The main anaerobic pathogen was clostridial infection (41.1%). At the same time, it is important to note that 28 (22.6%) patients had a polymicrobial etiology of the pathological process. *Escherichia coli* was detected in 46.8% of cases.
2. In 22 (17.7%), involvement of the perineal muscle structures in the pathological process was noted. This category of patients was characterized by a particularly severe and aggressive course of the disease. The median area of the lesion was 160 cm^2 , which required extensive operations to remove necrotic tissues.
3. The connection of the abscess with the rectum was clearly established in 45 patients (36.2%). In 67 patients (54.1%), the wound or injuries communicated with the anal canal, more precisely, with its posterior wall. In 65 (52.4%) cases, it was a subcutaneous access - the probe was directed towards the anus and entered the intestinal lumen almost freely, under the skin, i.e., the fistula was

intrasphincteric.

4. Clinically significant (III - V degrees Clavien-Dindo) postoperative complications requiring repeated surgery or threatening the patient's life occurred within 30 days in 21 (16.9%) patients.
5. 11 (8.8%) patients died, these were extremely severe patients admitted with septic shock. 8 patients died from intoxication against a background of the progression of anaerobic paraproctitis with damage to the large cellular spaces of the pelvis, perineum, and scrotum.

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