

Radical surgery for non-neoplastic colonic diseases

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A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation; D – writing the article; E – critical revision of the article; F – final approval of the article

Aim. To improve the results of surgical treatment for patients with non-neoplastic colonic diseases by optimizing the choice of radical surgery extent.

Materials and methods. The study material was the analysis of radical surgical interventions performed in 87 patients with non-neoplastic colonic diseases: ulcerative colitis, Crohn's disease, familial adenomatous polyposis, chronic colonic and coloproctogenic stasis, diverticular colon disease. The age of the operated patients was 20–72 years. There were 49 (56.3 %) men and 38 (43.7 %) women. The criteria for choosing the radical surgery extent for these diseases were defined and substantiated.

Results. There were 3 postoperative mortalities (3.4 %) among patients operated on absolute indications for acute complications of ulcerative colitis and Crohn's disease. Recurrences of ulcerative colitis, Crohn's disease and familial adenomatous polyposis occurred in 16 (18.4 %) operated patients in the area of the retained rectal stump and terminal ileum. Malignant transformation of the rectal stump occurred in 5 (5.7 %) patients with these recurrences. The extent of radical surgery in non-neoplastic colonic diseases depended on the diagnosis of the underlying disease, the presence of complications, the depth of wall lesions and the extent of the pathological process, the risk of recurrence in the anatomical parts of the small and large intestine.

Conclusions. Deciding on the extent of the radical stage of surgical intervention depended on the diagnosis, features of the clinical course of non-neoplastic colorectal diseases, recurrences, the general condition of a patient, the pathological process extent and severity. Performing the optimal extent of radical surgery for non-neoplastic colonic diseases helped reduce the number of recurrences in the terminal part of the small intestine to 4 (4.6 %), in the area of the rectal stump to 7 (8.1 %), improved functional outcomes and quality of life in 76 (87.3 %) operated patients.

Key words:

colon, ulcerative colitis, Crohn's disease, familial adenomatous polyposis, surgical treatment.

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Радикальні операції при непухлинних захворюваннях товстої кишки

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Мета роботи – покращити результати хірургічного лікування хворих на непухлинні захворювання товстої кишки шляхом оптимізації вибору обсягу радикального оперативного втручання.

Матеріали та методи. Проаналізували результати радикальних оперативних втручань, що виконані в 87 хворих (49 (56,3 %) чоловіків, 38 (43,7 %) жінок) із непухлинними захворюваннями товстої кишки: неспецифічним виразковим колітом, хворобою Крона, родинним аденоматозним поліпозом, хронічним кологенним і колопроктогенним стазом, дивертикулярною хворобою товстої кишки. Вік прооперованих пацієнтів – від 20 до 72 років. Визначили й обґрунтували критерії вибору обсягу радикальних операцій при названих захворюваннях.

Результати. Серед пацієнтів, оперованих за абсолютними показаннями з приводу гострих ускладнень виразкового коліту та хвороби Крона, післяопераційна летальність становила 3,4 % (3 випадки). У 16 (18,4 %) оперованих у ділянці куки прямої кишки та в термінальній ділянці клубової кишки виникли рецидиви виразкового коліту, хвороби Крона, родинного аденоматозного поліпозу. У 5 (5,7 %) пацієнтів на фоні цих рецидивів виникла малігнізація в куці прямої кишки. Обсяг радикального оперативного втручання при непухлинних захворюваннях товстої кишки залежав від діагнозу основного захворювання, наявності ускладнень, глибини ураження стінки та поширеності патологічного процесу, ризику виникнення рецидивів в анатомічних відділах тонкої та товстої кишки.

Висновки. Вибір обсягу радикального етапу хірургічного втручання залежить від діагнозу, особливостей клінічного перебігу непухлинних захворювань товстої кишки, виникнення рецидивів, загального стану пацієнта, поширеності та ступеня вираженості патологічного процесу. Виконання радикального хірургічного втручання з приводу непухлинних захворювань товстої кишки в оптимальному обсязі сприяло зменшенню кількості рецидивів у термінальній ділянці тонкої кишки до 4 (4,6 %) випадків, у ділянці куки прямої кишки – до 7 (8,1 %), покращенню функціональних результатів та якості життя у 76 (87,3 %) оперованих хворих.

Ключові слова:

товста кишка, виразковий коліт, хвороба Крона, родинний аденоматозний поліпоз, хірургічне лікування.

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The radical stage of surgical interventions for non-neoplastic colonic diseases, which include ulcerative colitis, Crohn's disease, familial adenomatous polyposis, chronic colonic or coloproctogenic stasis, diverticular colon disease, plays an extremely important role. A specified radical stage is important due to the fact that its insufficient extent poses a risk of the disease recurrence, thus, significantly negatively affects the functional outcomes of surgical treatment, social and occupational rehabilitation [1–3].

An unreasonable increase in the extent of radical surgical interventions leads to significant technical difficulties or makes it impossible to perform restorative or reconstructive-restorative stages of surgical interventions, causes the occurrence of pathological syndromes that significantly disrupt the functions of intestinal digestion, absorption, and anal continence [1,4,5]. Unlike colon cancer, with clearly defined oncological standards of radical surgical operations depending on the localization and stage of tumor development, in

case of non-neoplastic diseases, the issues of radicalism arise, especially in certain pathological conditions such as Crohn's disease of the colon, remain poorly specified and, therefore, debatable in some way [6,7].

Taking into account the technical difficulties of performing radical operations, mainly in case of acute complications of non-neoplastic diseases of the large intestine, particularly, peritonitis, toxic dilatation of the large intestine, or bleeding into the intestinal canal lumen, these operations require compliance with certain tactical provisions aimed at a lower extent at ensuring radicalism and, mostly, to reduce the frequency of postoperative complications, provide conditions and opportunities for the subsequent reconstructive and restorative stage of surgical interventions [1,4,7].

For these reasons, choosing a radical stage of surgical intervention for non-neoplastic diseases of the large intestine is a rather relevant issue of modern coloproctology, which requires specification and justification.

Aim

To improve the results of surgical treatment of patients with non-neoplastic colonic diseases by optimizing the choice of radical surgery extent.

Materials and methods

During the period from 2013 to 2022, 87 patients, 49 (56.3 %) men, 38 (43.7 %) women, were operated on non-neoplastic colonic diseases in the Coloproctology Center of Ukraine. The age of the operated patients was 20–72 years. Surgery for ulcerative colitis was performed in 21 (24.1 %) patients, Crohn's disease – 18 (20.6 %), familial adenomatous polyposis – 9 (10.3 %), decompensated chronic colonic stasis – 16 (18.4 %), coloproctogenic stasis – 8 (9.2 %), diverticular colon disease – 15 (17.2 %). Lesions through the entire colon were found in 29 (33.4 %) patients with ulcerative colitis, familial adenomatous polyposis, Crohn's disease. In case of diverticular colon disease, total lesions occurred only in 2 (2.3 %) patients, subtotal distal lesions – in 6 (6.9 %), descending and sigmoid colon lesions – in 7 (8.1 %). Right-sided lesions in Crohn's disease, in particular, of the ileum with a length of 15–70 cm, the cecum and ascending colon, were observed in 8 (9.2 %) patients.

Complications of the underlying disease were diagnosed in 34 (39.1 %) patients, of which acute complications – in 13 (14.1 %), chronic complications – in 21 (24.1 %). Among the common acute complications was peritonitis as a result of the colonic wall perforation, which was found in 6 (6.9 %) patients, in 4 of them – diverticular disease of the descending and sigmoid colon, in 2 – ulcerative colitis. Toxic dilatation of the colon occurred in 3 (3.4 %) patients with ulcerative colitis, bleeding into the colonic lumen – in 2 (2.3 %) patients with Crohn's disease. Also, 2 (2.3 %) patients with Crohn's disease developed multiple abscess cavities of external rectal fistulas that opened into the perineum. Acute complications with right-sided localization of Crohn's disease of the colon and terminal area of the ileum were not observed. Among chronic complications, 8 (9.2 %) patients were diagnosed with strictures of the cecum, cecum and a portion of the ascending colon, the terminal part of the

ileum, and 3 (3.4 %) – of the descending and sigmoid colon. Internal fistulas occurred in 8 (9.2 %) patients, of which interintestinal fistulas – in 6, intestinal-bladder fistulas – in 2. Two complications, in particular, strictures and internal fistulas, were observed in 3 patients. Paracolic inflammatory infiltrates of the left colon occurred in 5 (5.7 %) patients with diverticular colon disease. In recurrences of the underlying disease at the late postoperative period, 5 (5.7 %) patients were diagnosed with malignancy in the rectal stump area after the radical stage of surgical intervention.

Associated diseases were diagnosed in 24 (27.4 %) patients, namely, hypertensive disease – in 7, coronary heart disease – in 5, obesity – in 4, diabetes – in 3, duodenal peptic ulcer – in 3, superficial varicose veins of the lower extremities – in 2.

According to absolute indications, 34 (39.1 %) patients were operated on. Among them, acute complications of the underlying disease – 13 (14.1 %), chronic complications – 21 (24.1 %). 53 (60.9 %) patients were operated on according to relative indications, mainly due to a long-term aggressive course of the disease, hormone-dependent and hormone-resistant forms of ulcerative colitis and Crohn's disease, severe degree (D III) of colonic mucosa dysplasia.

The radical stage of surgical intervention consisted in performing a colectomy of the ultralow anterior rectum resection, mucosectomy – in 14 (16.1 %) patients, colectomy of the ultralow anterior rectum resection, mucosectomy, resection of the terminal part of the ileum – in 12 (13.8 %), colectomy – in 8 (9.2 %), colectomy with rectal resection – in 7 (8.1 %), residual colectomy – in 3 (3.4 %), residual colectomy and rectal resection – in 2 (2.3 %), colectomy and rectal extirpation also in 2 (2.3 %), subtotal distal colon resection in – 17 (19.5 %), subtotal distal colon resection and rectal resection – in 4 (4.6 %), left-sided hemicolectomy – in 10 (11.5 %), resection of the ileocecal junction – in 8 (9.2 %). Among the indicated radical surgical interventions, 13 (14.1 %) patients with acute complications underwent an obstructive type of radical operations. Among them, colectomy with resection of the rectum, formation of a rectal stump and ileostomy – for patients with acute complications of ulcerative colitis, Crohn's disease, familial adenomatous polyposis with significant metabolic disorders that could not be corrected by infusion therapy. In case of peritonitis caused by perforation of left-sided colonic diverticula, a left-sided hemicolectomy was performed. Colectomy and rectal extirpation were performed for patients with Crohn's disease involving the entire colon with rectal fistulas and multiple abscesses in the lumen of these fistulas.

Later, in 12–18 months, the radical stage of surgery was completed by performing extirpation of the rectal stump, mainly from the perineal access, in 2 (2.3 %) patients due to the underlying disease progression in the rectal stump after colectomy or colectomy with the closure type of rectal resection in the rectal sphincter destruction. 7 (8.1 %) patients with ulcerative colitis, Crohn's disease and familial adenomatous polyposis did not have signs of inflammation or mucosal polyps in the area of the rectal stump, and there was a satisfactory function of the rectal sphincters. In these patients, the rectal stump was not removed, but an ileorectal anastomosis was formed with an appropriate small intestinal reservoir structure.

The rationale for preserving the rectal stump during this secondary reconstructive and restorative surgery was based on the relevant provisions of the III Congress of Coloproctologists of Ukraine, set out in the resolution of this Congress. The main requirement for the rectal stump preservation was the absence of pathological process signs there. The radical stage of surgical intervention was completed with ultra-low rectal stump resection, mucosectomy of the surgical anal canal with subsequent formation of ileo-endoanal anastomosis and pelvic small intestinal reservoir in 4 (4.6 %) patients with a slightly pronounced inflammatory process of the rectal stump mucous membrane of the I-II degree of activity in ulcerative colitis, I-II degree of inflammatory process severity in Crohn's disease, existing rectal stump polyps and no signs of malignancy of these polyps in familial adenomatous polyposis.

Performing mucosectomy as a component of the radical stage of surgical treatment for colectomy and ultralow anterior resection of the rectum required a differentiated approach depending on the pathological process features of the lower ampullary part of the rectal mucous membrane. Preference was given to mucosectomy – the removal of only the surgical anal canal mucous membrane, limited proximally to the upper edge of the deep portion of the external rectal sphincter, distally – to the level of the dentate line. Indications for mucosectomy were the first-degree activity of the inflammatory process in ulcerative colitis and the first-degree severity of pathological changes in Crohn's disease, as well as familial adenomatous polyposis, i. e. conditions in which only the mucous membrane of the surgical anal canal was affected. In case of more pronounced pathological changes in the lower ampullary part of the rectum, in particular, damage not only to the mucous membrane, but also to the submucosa, which corresponded to the II-III degree of the inflammatory process activity in ulcerative colitis and the II-III severity degree of the pathological process in Crohn's disease, in order to ensure sufficient radicalism, a more traumatic mucosubmucosectomy was constrainedly performed – removal of the mucous membrane and submucosa. The traumatic nature of mucosubmucosectomy is due to a significant risk of damage to the internal anal sphincter, which subsequently leads to scarring of this sphincter and anal incontinence.

Segmental resections of the intestinal canal were performed in case of complicated course of Crohn's disease. Among these complications, stricture of the terminal part of the ileum, cecum and partially ascending colon, internal interintestinal, entero-bladder fistulas were the most frequent. 8 (9.2 %) patients were operated on for the listed complications. They underwent resection of the ileocecal transition and wedge-shaped removal of the intestinal canal walls with fistula openings: the duodenum in 3 patients and the sigmoid colon in 3 patients, and the bladder wall was resected in another 2 patients. With stricture of the descending colon and sigmoid colon, 3 (3.4 %) patients underwent left-sided hemicolectomy.

Indications for surgical treatment of colonic or coloproctogenic stasis were the stage of subcompensation of the disease after prolonged, more than 6 months, ineffective conservative treatment, as well as the stage of decompensation. Such complications of this disease as perforation of the intestinal wall, coprostasis, chronic decompensated colon obstruction, were not observed.

The choice of the radical stage extent of the surgical intervention in colonic and coloproctogenic stasis depended on the functional state features of the large intestine anatomical sections. Considering the prevalence of these lesions, the following radical operations were performed: subtotal distal colon resection, subtotal distal colon resection and rectal resection, colectomy, colectomy with rectal resection. A significant range of these radical operations was caused by a justified attempt to save the anatomical sections of the colon with preserved peristaltic and propulsive capacity to improve the function of intestinal digestion and absorption and, thus, reduce the severity of the post-colectomy syndrome.

It should be noted that 3 (3.4 %) patients with colonic stasis and 2 (2.3 %) patients with coloproctogenic stasis were referred from other medical institutions right after insufficiently radical surgical treatment. Three of them underwent left-sided hemicolectomy at their place of residence, and 2 – resection of the sigmoid colon. In the late postoperative period, these patients had signs of colonic and coloproctogenic stasis as an impossibility of defecating, a significantly delayed transit time of the barium sulfate mixture through the anatomical sections of the colon after the radical stage of surgical interventions. After further examination and diagnostic clarification of the disease, residual surgical interventions were performed: colectomy – in 3 cases, colectomy with resection of the rectum – in 2 cases. The extent of the indicated operations corresponded to the pathological process prevalence in the colon, which significantly improved the function of defecation.

Urgent surgical interventions for diverticular disease were performed for 4 (4.6 %) patients with widespread peritonitis due to perforation of diverticula of the descending and sigmoid colon. Obstructive left-sided hemicolectomy was performed for these patients, and a monotransvesostomy was formed. Planned surgical interventions for diverticular disease of the colon were performed for 11 (12.6 %) patients. Of them, 5 (5.7 %) had inflammatory paracolic infiltrates refractory to conservative therapy, and 6 (6.9 %) had significant risk for recurrence of bleeding into the colonic lumen, as mentioned patients experienced two or three cases of conservatively stopped bleeding in the past. In 3 (3.4 %) patients with lesions of the descending and sigmoid colon, left-sided hemicolectomy was performed, in 6 (6.9 %) – with lesions of the sigmoid, descending and transverse colon – subtotal distal resection of the colon. Colectomy was performed in 2 (2.3 %) patients with lesions of the cecum and all anatomical sections of the colon.

In case of acute complications and significant metabolic disorders absence, radical surgical interventions were completed performing primary reconstructive operations by forming appropriate interintestinal anastomoses.

Results

Early postoperative complications caused by the radical stage of surgical interventions, in particular, intra-abdominal bleeding, iatrogenic damage to the abdominal cavity and retroperitoneal space organs did not occur. Postoperative mortality was 3 (3.4 %), exclusively among patients operated on absolute indications for acute complications of ulcerative colitis and Crohn's disease.

These patients were hospitalized and operated on for emergency reasons. Two of them were hospitalized for widespread purulent fecal peritonitis associated with aggressive ulcerative colitis and Crohn's disease due to intestinal perforation. These patients underwent obstructive colectomy and ileostomy formation. With regard to progressive peritonitis, according to the existing indications, one of them underwent a series of planned sanitation relaparotomies, and the vacuum assisted closure technique (VAC-therapy) was used for others. These surgical interventions, antibiotic therapy, and multicomponent infusion therapy, in accordance with generally accepted standards, did not lead to the recovery of these patients. Despite a significant reduction in the peritoneal inflammation, deaths occurred due to progressive multiorgan failure. The death of a patient operated on for toxic colonic dilatation in severe ulcerative colitis was due to multiple organ failure caused by severe metabolic disorders associated with intoxication and the inability to compensate for them.

Recurrences of the underlying diseases occurred in 17 (19.4 %) operated patients within 1 to 5 years.

After obstructive colectomy with rectal resection and secondary reconstructive surgery, 7 (8.1 %) patients had recurrences of diseases in the retained rectal stump area 1–2 years after. Recurrence in Crohn's disease of the colon occurred in 3 (3.4 %) patients, ulcerative colitis – in 2 (2.3 %), accompanied by an anti-relapse treatment according to generally accepted standards, as well as familial adenomatous polyposis – in 2 (2.3 %) patients.

In addition, amidst these recurrences, 5 (5.7 %) patients developed malignancy later: 1 patient had recurrent ulcerative colitis, 2 patients – Crohn's disease of the colon, and 2 had familial adenomatous polyposis. These patients underwent rectal stump extirpation, formation of a permanent ileostomy. Disease recurrences in the terminal area of the ileum occurred in 4 patients, of these, Crohn's disease – in 2, ascending ileitis – in 1, single adenomatous polyps in the terminal area of the ileum – in 1 patient. In these patients, the terminal area of the ileum was not removed during the radical stage of surgery procedures. They were operated on in the period before the using tactics that involved an extension of radical surgical interventions by removing the terminal part of the ileum during colectomy, ultralow anterior resection of the rectum, and mucosectomy of the surgical anal canal. Patients with recurrent Crohn's disease and ascending ileitis underwent conservative treatment according to generally accepted standards, including anti-relapse therapy, with positive results. The patient with adenomatous polyps in the terminal area of the ileum underwent endoscopic polypectomy. All these patients were under constant monitoring in order to timely diagnose the disease recurrences and control the effectiveness of anti-relapse therapy.

Discussion

Limitation of the radical surgery extent in patients with acute complications of non-neoplastic diseases of the colon, in particular ulcerative colitis, Crohn's disease of the colon with entire damage, severe clinical course of familial adenomatous polyposis, as well as a refusal to perform the primary reconstructive and restorative stage of surgical intervention was determined by significant metabolic disorders, existing

multiple organ failure, the risk of postoperative complications that posed a threat to their lives.

Radical surgical interventions in patients operated on a planned basis according to absolute indications for familial adenomatous polyposis as an obligatory precancerous condition, chronic complications of ulcerative colitis, Crohn's disease of the colon with entire damage, or operated according to relative indications, had certain features, which consisted in performing the radical stage in accordance with generally accepted international standards, in the extent of colectomy, ultralow anterior resection of the rectum, mucosectomy of the surgical anal canal. According to the majority of authors, this operation is sufficiently radical for the specified diseases, as it involves the removal of all anatomical sections of the large intestine, as well as the mucous membrane of the surgical anal canal, affected by the pathological process. The definite scope of the radical operation also appealing because it ensures the rectal sphincter preservation, and therefore the anal sphincteric function, as well as the possibility of performing the reconstructive and restorative stage of the surgical intervention. However, in the surgical treatment of patients with ulcerative colitis, Crohn's disease affecting entirely the large intestine, familial adenomatous polyposis, in addition to colectomy, ultralow anterior resection of the rectum, mucosectomy of the surgical anal canal, resection of the terminal area of the ileum with a length of at least 15 cm was performed. Volume extension of the radical stage of surgical intervention due to the resection of the terminal part of the ileum was due to a significant recurrence risk of the above-mentioned diseases in it. The risk of recurrence in the terminal area of the ileum was due to the following pathological conditions: ascending ileitis in ulcerative colitis, damage to the terminal area of the ileum in Crohn's disease of the colon, as well as in familial adenomatous polyposis often manifesting in the postoperative period. That is why we consider the resection of the terminal part of the ileum as an important and sufficiently justified measure to prevent recurrence during the surgical treatment of the above-mentioned diseases.

These observations regarding recurrences of ulcerative colitis, Crohn's disease, familial adenomatous polyposis in the terminal area of the ileum, and rectal stump retained after the radical stage of surgical intervention, cases of malignancy in the rectal stump, indicate insufficient radicality of colectomy and ultralow resection of the rectum with mucosectomy and, especially, colectomy with rectal resection, in the mentioned non-neoplastic intestinal diseases. Based on our data, we believe colectomy, ultralow resection of the rectum, mucosectomy with resection of the terminal part of the ileum at least 15 cm in length a sufficiently radical operation for ulcerative colitis and familial adenomatous polyposis and even more radical for patients with entirely affected large intestine in Crohn's disease. The distinctive feature of this operation is not only the anatomical parts of the colon and its strictures removal, but also the mucous membrane of the surgical anal canal affected by the pathological process, as well as the terminal part of the ileum, where recurrences of the above-mentioned diseases are most likely to occur.

Insufficient radicalism of surgical interventions was the main reason for unsatisfactory functional outcomes of surgical treatment of colonic and coloproctogenic stasis.

Based on the obtained data, it should be noted that surgical interventions in chronic colonic and coloproctogenic stasis should be sufficiently radical depending on the characteristics of the damage to the large intestinal anatomical parts. Performing any segmental resections of the large intestine in the specified pathological conditions is considered contraindicated, as they do not ensure the removal of the affected areas of the large intestine and favorable functional outcomes.

In patients operated on for diverticular disease, the radical stage extent of surgical intervention consisted in removing the part of the large intestine affected by diverticula. Cases of the disease recurrence in these patients were not observed in the retained anatomical intestinal sections indicating the choice validity and sufficient radicalism of the performed operations.

Thus, the radical stage of surgical intervention is an important and responsible measure of surgical treatment for patients with non-neoplastic colonic diseases. The choice of this stage extent depended on the underlying disease diagnosis, the characteristics of its clinical course, in particular, the presence of acute or chronic complications, the depth of the pathological process in the intestinal wall and its prevalence in anatomical parts, as well as the characteristics of the disease recurrences. Performing the optimal extent of the radical stage of surgical intervention contributed to a significant reduction in recurrences of non-neoplastic colonic diseases to 11 (12.7 %) and improved quality of life in 76 (87.3 %) operated patients. We consider the main tasks of radical surgery to be the pathological process elimination, disease recurrence prevention, maximum preservation of the intestinal canal and rectal sphincters to ensure the possibility of performing restorative and reconstructive-restorative stages of surgical interventions.

Conclusions

1. The choice of the radical stage extent in surgical interventions depended on the diagnosis, clinical course features of non-neoplastic colorectal diseases, recurrence, general condition of a patient, prevalence and severity of the pathological process.

2. Performing the optimal extent of radical surgery for non-neoplastic colonic diseases helped to reduce the number of recurrences in the terminal part of the small intestine to 4 (4.6 %), in the area of the rectal stump to 7 (8.1 %), and improved functional outcomes and quality of life in 76 (87.3 %) operated patients.

The prospects of further research, in the opinion of the author, are in the development and implementation of organ-preserving radical surgical interventions for non-neoplastic diseases of the large intestine.

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