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SURGICAL TREATMENT METHOD FOR CHRONIC COPROSTASIS IN DECOMPENSATED DOLICHOSIGMA SHAPED

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Summary. *Objective:* To enhance outcomes in endovideosurgical treatment for patients with chronic coprostasis associated with decompensated dolichosigma. *Methods:* Patients with chronic constipation treated at City Multispecialty Hospital No. 2 in Astana from 2019 to 2023 underwent laparoscopic left-sided hemicolectomy using a specialized technique for decompensated dolichosigma and chronic coprostasis. Of the 28 patients admitted during this period, 25 received surgery using the new technique, while three urgently underwent surgery for acute intestinal obstruction. Patients in the new technique group had a shorter hospital stay (7-8 days) compared to those with traditional sigmoid colon resection (12.0 ± 1.1 days). Comprehensive assessments included clinical and laboratory studies, instrumental examinations, and microbiological investigations. Laparoscopic equipment was used for all surgeries. *Results:* The new surgical method led to an average hospital stay of 7-8 days, shorter than the traditional surgery group's 12.0 ± 1.1 days, with no postoperative complications. Comprehensive rehabilitation after surgery was followed by 6 to 12 months of medical monitoring. Colonic function fully recovered in the new method group, marked by regular, well-formed stools without laxative use. Patients reported an improved quality of life and a return to work activities during follow-up. *Conclusion:* The enhanced endovideosurgical approach for managing coprostasis in patients with decompensated dolichosigma substantially diminishes the occurrence of procedure-associated complications, leading to a reduction in the duration of postoperative recovery and temporary work incapacity for affected individuals.

Key words: chronic coprostasis, dolichosigma, laparoscopic left-sided hemicolectomy method, selection criteria.

СПОСОБ ХИРУРГИЧЕСКОГО ЛЕЧЕНИЯ ХРОНИЧЕСКОГО КОПРОСТАЗА ПРИ ДЕКОМПЕНСИРОВАННОЙ ФОРМЕ ДОЛИХОСИГМЫ

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Резюме. *Цель исследования:* улучшить результаты эндовидеохирургического лечения пациентов с хроническим копростазом, ассоциированным с декомпенсированной долихосигмой. *Методы:* Пациентам с хроническим запором, проходившим лечение в Городской многопрофильной больнице № 2 г. Астана с 2019 по 2023 год, была выполнена лапароскопическая левосторонняя гемиколэктомия по специализированной методике при декомпенсированной долихосигме и хроническом копростазе. Из 28 пациентов, поступивших за этот период, 25 были прооперированы по новой методике, а трое в срочном порядке прооперированы по поводу острой кишечной непроходимости. Пациенты в группе с новой методикой имели более короткое пребывание в стационаре (7-8 дней) по сравнению с пациентами с традиционной резекцией сигмовидной кишки (12,0 ± 1,1 дня). Комплексная оценка включала клинические и лабораторные исследования, инструментальные обследования и микробиологические исследования. Для всех операций использовалось лапароскопическое оборудование. *Результаты:* Новый хирургический метод привел к тому, что средняя продолжительность пребывания в стационаре составила 7-8 дней, что меньше, чем в группе традиционной хирургии (12,0 ± 1,1 дня), без каких-либо послеоперационных осложнений. За комплексной реабилитацией после операции последовало медицинское наблюдение в течение 6-12 месяцев. Функция толстой кишки полностью восстановилась в группе нового метода, что было отмечено регулярным, хорошо сформированным стулом без применения слабительных. Пациенты сообщали об улучшении качества жизни и возвращении к трудовой деятельности во время последующего наблюдения. *Заключение:* Усовершенствованный эндовидеохирургический подход к лечению копростаза у пациентов с декомпенсированной долихосигмой существенно снижает частоту осложнений, связанных с процедурой, что приводит к сокращению продолжительности послеоперационного восстановления и временной нетрудоспособности пострадавших.

Ключевые слова: хронический копростаз, долихосигма, метод лапароскопической левосторонней гемиколэктомии, критерии отбора.

ДОЛИХОСИГМАНЫН ДЕКОМПЕНСАЦИЯЛАНГАН ТҮРҮНДӨГҮ ӨНӨКӨТ КОПРОСТАЗДЫ ХИРУРГИЯЛЫК ДАРЫЛОО ЫКМАСЫ

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Корутунду. *Изилдөөнүн максаты:* декомпенсацияланган долихосигма менен байланышкан өнөкөт копростаз менен ооруган эндовидеохирургиялык дарылоонун натыйжаларын жакшыртуу. *Методдор:* 2019-2023-жылдары Астана шаардык көп тармактуу ооруканада 2019-жылдан 2023-жылга чейин дарыланган өнөкөт ич катуусу бар бейтаптарга декомпенсацияланган долихосигма жана өнөкөт копростаз менен адистештирилген ыкма боюнча Лапароскопиялык сол тараптуу гемиколэктомия жасалды. Бул мезгилде кабыл алынган 28 бейтаптын 25ине жаңы техника боюнча операция жасалган, ал эми үчөөнө тез арада курч ичеги тоскоолдуктары боюнча операция жасалган. Жаңы методология тобундагы бейтаптар салттуу сигмоид резекциясы менен ооругандарга салыштырмалуу стационардык (7-8 күн) кыскарган (12.0±1.1 күн). Комплекстүү баалоо клиникалык жана лабораториялык изилдөөлөрдү, инструменталдык экспертизаларды жана микробиологиялык изилдөөлөрдү камтыйт. Бардык операциялар үчүн Лапароскопиялык жабдуулар колдонулган. *Жыйынтыктар:* жаңы хирургиялык ыкма 7-8 күндүн ичинде ооруканада болуунун орточо узактыгын алып келди, бул салттуу хирургия тобуна караганда (12.0 ± 1.1 күн), операциядан кийинки кыйынчылыктарсыз. Операциядан кийин комплекстүү реабилитация 6-12 ай бою медициналык көзөмөлдөн өттү. Ичеги-карындын иштеши жаңы ыкманын тобунда толук калыбына келди, бул ич алдырма каражаттарды колдонбостон, жакшы калыптанган Табуретка менен белгиленди. Бейтаптар кийинки мезгилде жашоо сапаты жакшырып, жумушка кайтып келишкенин билдиришти. *Жыйынтыктар:* декомпенсацияланган долихосигмасы бар пациенттерде копростазды дарылоонун жакшыртылган эндовидеохирургиялык ыкмасы процедурага байланыштуу татаалдашуу ылдамдыгын олуттуу түрдө азайтат, натыйжада операциядан кийинки калыбына келтирүү узактыгы жана жабыркагандардын убактылуу эмгекке жарамсыздыгы кыскарат.

Негизги сөздөр: өнөкөт копростаз, долихосигма, лапароскопиялык сол жак гемиколэктомия, тандоо критерийлери.

Introduction. Constipation is a chronic issue for many patients worldwide. In certain patient groups, such as the elderly, constipation poses a significant medical problem. Constipation is a serious medical and social problem. According to studies by various authors, in developed countries, 30 to 50% of the working-age population [1] and 5 to 20% of children suffer from constipation to varying degrees. Among the elderly, constipation occurs 5 times more frequently than in young individuals [2,3,4]. In Western populations, the prevalence ranges between 1% and more than 20%. In studies of the elderly population, up to 20% of individuals living at home and 50% of elderly individuals residing in nursing homes report symptoms of constipation [World Gastroenterology Organisation Clinical Handbook, 2010].

Studies conducted in Kazakhstan have also shown that in cases of decompensated dolichosigma, chronic coprostasis affects women in 78% of cases. Among them, 62% were of working age [5,6].

Various studies have examined the impact of several factors contributing to constipation. To prevent oversimplification, it is crucial to take into account the occurrence and factors contributing to constipation, along with their complexity, interaction, and potential overlap. Lack of a diet rich in vegetables and low fluid intake can lead to constipation. Furthermore, there is a growing number of emergency department visits and hospitalizations due to constipation, especially among the younger patient population [7-13].

Currently, two pathophysiological mechanisms are known, differing in principle but overlapping: transit disturbances and evacuation disorders. Often, evacuation disorders are a consequence of the first mechanism: excessive slowing of transit of intestinal contents in the colon. Significant elongation of various parts of the colon also plays a significant role in the development of chronic constipation.

Prolonged pharmacological treatment of chronic coprostasis resulting from an elongated colon, including the sigmoid colon, leads to impaired intestinal function and transposition of intestinal contents, ultimately raising the question of the necessity of surgical intervention. The decompensated form of dolichosigma, in

which the sigmoid colon can extend up to 110-130 cm, forming additional bends in both the sagittal and frontal planes, descending low into the pelvic cavity, is a cause of chronic coprostasis that does not respond to conservative treatment. This fact results in reduced social activity of the working-age population, and in some cases, disability and a decrease in quality of life [13-20].

Research Objective: to enhance the outcomes of the endovideosurgical treatment method for patients with chronic coprostasis in the decompensated form of dolichosigma.

Materials and Methods. Patients suffering from chronic constipation due to anatomical and functional issues with their colon were treated at the Department of Surgical Infections and Coloproctology at "City Multispecialty Hospital No. 2" in Astana between 2019 and 2023. Those with decompensated dolichosigma and chronic coprostasis, who had not responded to extended conservative therapy, underwent a laparoscopic left-sided hemicolectomy using a specialized technique (Patent No. 34968 dated February 7, 2020). This technique involves an endovideosurgical approach and includes the mobilization of the left colonic segment at the descending colon level while preserving major vascular arcades of the 1st and 2nd orders (branches of the middle colic artery), without transposing the ileocecal angle to the left.

Throughout this timeframe, 28 patients were admitted, and among them, 25 individuals (89.2%) underwent scheduled surgeries utilizing the devised method. Among them, 21 (84%) were female and 4 (16%) were male: with ages ranging from 18 to 53 years. A subgroup of patients (10.8%) arrived as emergencies with a preliminary diagnosis of "Acute Intestinal Obstruction." Among these cases, one patient (3.6%) required sigmoid resection due to dolichosigma, and two patients (7.2%) were operated on for malignant neoplasms of the sigmoid colon. The post-operative mobilization of patients occurred within one day after the surgery. On average, patients treated using the developed technique had a hospital stay of 7-8 days. In contrast, patients treated with the traditional method (sigmoid colon resection) had an average hospital stay of 12.0 ± 1.1 days.

All patients underwent a series of examinations, including:

- Clinical and laboratory investigations: Complete Blood Count (CBC), Urinalysis (UA), Biochemical assays, Stool analysis.
- Instrumental examinations: Chest X-ray, Abdominal Ultrasound (US), Fecal Calprotectin test, Abdominal CT, MRI, and Irrigoscopy as required. Furthermore, microbiological and biostatistical analyses were carried out.

The laparoscopic surgeries were performed using the GelPort Laparoscopic System (Applied Medical) with manual assistance.

Results. This study analyzed the outcomes of 25 patients who underwent surgery using the developed method. Among them, 25 patients (89.2%) were operated on using the developed method. In one case (3.6%), sigmoid resection was performed for a patient with dolichosigma, and in two cases (7.2%); surgery was conducted due to malignant neoplasms of the sigmoid colon. The neoplasm infiltrated the mucosal and muscular layers, causing a stenosis of the sigmoid colon's lumen by 2/3 of its diameter. Revision of adjacent organs, anatomical structures, and distant metastases did not reveal any abnormalities. An extended left-sided hemicolectomy was performed. Chronic coprostasis due to decompensated dolichosigma predominantly affected female patients (84%). The patients were mobilized within 1 day after the surgery. There were no postoperative complications. The average length of hospital stay for patients operated on using the developed technique was 7-8 days. The average length of hospital stay for patients who underwent sigmoid colon resection and extended left-sided hemicolectomy was 12.0 ± 1.1 days. One month postoperatively, the follow-up revealed normalized bowel movements occurring once a day (previously delayed for up to a month), improved overall well-being, enhanced memory and attention, absence of chronic fatigue symptoms, and improved overall appearance (shiny hair, improved skin complexion and color), which significantly contributed to the emotional status of the patients and, consequently, their improved quality of life. The cumulative treatment outcomes of patients with chronic constipation using the proposed technique, along with adherence to all its stages and postoperative management involving

measures aimed at preventing complications and promoting early restoration of colonic function, resulted in positive outcomes (good and satisfactory) in 22 cases (90.1%). This enabled the restoration of colonic passage in patients and thereby addressed the medical and social rehabilitation of patients with chronic constipation during the postoperative period. Six months later, patients treated with the new technique were invited for a follow-up examination. The examination results demonstrated that all 25 patients had fully restored colonic function and regained regular, well-formed stools without the use of laxatives. Oral interviews with patients indicated an improvement in their quality of life and a restoration of work activity.

Discussion. Discussion: Patients suffering from chronic coprostasis due to decompensated dolichosigma underwent a comprehensive assessment, including an in-depth investigation of the radiological features of the colon. Particular emphasis was placed on analyzing the position of the sigmoid colon, its displacement during breathing and straining, and a meticulous examination of contours, peristalsis, and mucosal patterns to identify structural abnormalities. Thorough scrutiny of the patients' medical histories was conducted. The results of the investigations revealed that the most prevalent general complaints were constipation (94.8%) and abdominal pain (100%). Among the patients, 20 (80.0%) had various contributing factors leading to the onset of constipation: dietary modifications in 10 (40.0%) cases, psychological trauma in three (12%), and prolonged travel and fasting in seven (28%) instances. Radiological assessments unveiled structural alterations in the colon for nine (36.0%) patients. Barium enema studies demonstrated notable dilation of the left portion of the colon accompanied by changes in its shape in eight (32.0%) of the examined subjects.

Out of the 25 patients, we examined who were diagnosed with chronic coprostasis, dolichosigma was detected in 24 (96.0%) cases, and dolichocolon was observed in one (4.0%) patient. The most prominent modifications were observed in the radiological attributes of the sigmoid colon. The position of the sigmoid colon, resembling a node within the pelvic region, was detected in two (8.0%) patients; in the projection of the greater pelvis (extending up to the line connecting the crests of the iliac bones) in 10 (40.0%) patients; and within the abdominal cavity in 2 (8.0%) patients. The number of sigmoid colon loops increased: one loop in 4 (16%) patients, two loops in 11 (44.0%) patients, and three or more loops in 10 (40.0%) patients. Changes in the length of the sigmoid colon were pathological, with loops reaching the upper half of the abdominal cavity or a sigmoid colon characterized by multiple loops, affecting 9 (36%) patients. The most diagnostically valuable metric was the diameter of the sigmoid colon, which exhibited moderate dilation in 13 (52.0%) patients and substantial dilation or funnel-like expansion in 12 (48.0%) patients. Consequently, radiological investigations provided insights into colon anatomy (shape, segment dimensions, descending colon topography, and haustral patterns), detection of structural alterations (narrowing, persistent spasms), and evaluation of certain functional aspects (contrast medium evacuation from the colon, descending colon tonus). Nevertheless, this study's informativeness was limited concerning determining the resection extent and underlying causes of chronic colostasis.

We evaluated standard parameters of surgical treatment for chronic coprostasis in patients who underwent the newly developed laparoscopic approach (25 patients) and those treated conventionally (control group). We assessed postoperative treatment duration, surgical procedure duration, and postoperative complication occurrence, all of which were notably lower in the main group. Our research validated the substantial effectiveness and minimally invasive nature of the laparoscopic technique, as clearly demonstrated during the postoperative period, resulting in a shorter and less taxing recovery phase. Thus, patients in the main group experienced significantly less invasive procedures, reduced postoperative complications, shortened hospital stays, and no fatalities. Notable benefits of this method included the absence of pronounced pain and early patient mobilization due to reduced surgical trauma and aggression, effectively mitigating the risk of cardiorespiratory complications in the postoperative phase. Surgical management of chronic coprostasis

patients should embrace the broader implementation of minimally invasive techniques, including laparoscopic bowel resection, substantially enhancing both immediate and long-term surgical outcomes, which align with the findings of other researchers [21,22].

Conclusion. The improved method of endovideosurgical treatment for coprostasis in patients with decompensated dolichosigma leads to a notable decrease in complications associated with the procedure, along with a reduction in the duration of postoperative recovery and temporary work incapacity for patients.

Practical Implications. A treatment approach has been devised to manage chronic coprostasis in patients with decompensated dolichosigma, utilizing the proposed endovideoscopic surgical method. This strategy demonstrates superior results in contrast to conventional surgical procedures. Moreover, it contributes to an improved quality of life for patients in both the immediate and extended postoperative phases.

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