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INITIAL EXPERIENCE WITH THE USE OF LAPAROSCOPIC SURGERY IN THE MANAGEMENT OF COLORECTAL TUMOURS

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Summary : To assess operative outcomes of laparoscopic surgery in colorectal cancer.**Materials and methods**: This is the outcome of treatment of colorectal cancer patients who were managed in the abdominal surgery department of "VOKOD" from April 2015 to April 2016, and underwent laparoscopic surgery for their treatment. All the patients had histopathological confirmation of their diagnosis. The patients received preoperative preparation and subsequently definitive surgery.A total of 25 patients (10 males and 15 females) had laparoscopic surgery within the period under review. The median age was 62.33±2.27 years. There were 9 resections of the sigmoid colon, 6 low anterior resections, 2 left-sided hemicolectomies , 6 right-sided hemicolectomies, 2 resections of the rectosigmoid colon.**Results**: 9% of patients had Grade I, 62% had Grade II and 29% had Grade III disease according to histopathological grade. The stage of disease was classified using Dukes classification; Dukes A-14%, Dukes B-27%, Dukes C-54%, Dukes D-5%. The average duration of surgery was 197.6±10.9 min with average blood loss of 110 ±19ml. The rate of conversion to laparotomy was 8%. There was no complication of anastomosis and no mortality during the study. Patients had significantly reduced postoperative pain, less postoperative trauma with an earlier restoration of bowel function and rehabilitation.**Conclusions**: Our initial experience shows that the use of laparoscopic-assisted interventions on colonic and rectal malignant neoplasms is reasonable and appropriate and results in fewer postoperative complications (in agreement with published literature), reduce the severity of pain and decrease requirements for opioid analgesics. Laparoscopic techniques allow performance of surgical intervention in compliance with all the principles of cancer surgery, providing the necessary volumes and clear resection margins. Based on improving medical technology and experience, the duration of laparoscopic surgery will approach that of traditional laparotomy with improvements in quality and long-term results.

Key words : rectal cancer, colon cancer, laparoscopic surgery.

Introduction. Colon cancer, according V.T.Kohnyuk et al., is one of the most common malignant tumors [1]. Worldwide, colorectal cancer currently ranks third in terms of incidence [1]. According to E.N. Imyanitov [2] an individual's lifetime risk of developing the disease reaches 5-6%. This means that during a lifetime, one of 15-20 people develop cancer this location [2]. According to H. Jaap Bojer et al. [3] in the world each year about 1.4 million new cases of colorectal cancer and 694 000 deaths result from the disease [3]. According Sukonko O.G., the incidence for the past 10 years has been steadily increasing. Since 2008, Belarus has registered more than 40 000 cases of malignant neoplasms in the year, and in 2013, 44,010 were diagnosed with cancer [5] of which 33.1% of men and 25.3% of women were in the working age group [5].

Belarus is among the group of countries with relatively low incidence, not much different from the Baltic countries, Russia and Ukraine, that is 26.7 cases per 100000 population. This indicates a stable long-term trends in disease patterns [5]. Mortality has remained fairly constant in the same group of countries [5]. In the context of morbidity in the Republic of Belarus, colorectal cancer is 10.3%: men - 10% (fourth place), and for women - 10.7% (third place) [1, 2, 5]. Despite the advances in drug therapy for colorectal cancer, surgery remains the primary treatment for patients with curative intent. The advances in modern surgery and anesthesiology allow patients who a few decades ago would have been denied surgery

to become candidates for radical surgical treatment.

Laparoscopic techniques of surgical interventions are one of the greatest achievements of modern surgery. The start of the so-called "laparoscopic revolution" in surgery was the first medical publications about laparoscopic cholecystectomy in 80s the 20th century. Subsequently, laparoscopic technique has become a priority for many types of surgery in gynecology, hernia repair, bariatric surgery, trauma and orthopedics. However, the "laparoscopic revolution" for a long time did not revolutionize colorectal cancer surgeries, and there are two main reasons; First, for a long time, surgeons were not sure about the safety of laparoscopic surgery on colon, compared with open surgery, which casts doubt on the long-term results of treatment, and hence its effectiveness as a whole; The second reason was the technical difficulty of laparoscopic surgery on the colon, as compared to the open surgery [6,7,8,9,10,11,12,13].

Today, coloproctology is one of the rapidly developing frontiers of endovideosurgery. The first laparoscopic surgery was performed in 1990 in the United States. M. Jacobs performed the world's first laparoscopic-assisted right-sided hemicolectomy with anastomosis done with a minilaparotomy access. Then P. Lahey performed resection of the sigmoid colon, and the left-sided hemicolectomy was performed by D .Flower. [8]. Laparoscopic surgery on the colon, have general principles and features related primarily to the necessity of manipulations in several parts of the abdominal cavity, removing the surgical preparation of large volumes, usually forming intestinal anastomosis as well as the presence of extensive wound surface [7, 8, 9, 14, 15]. In recent years, the safety of laparoscopic surgery in the treatment of colon cancer has been definitively proven with a large number of publications about results of research on this topic (CLASICC, COLOR II, COREAN). Therefore, it can be argued that laparoscopic surgery is as safe and effective as conventional open abdominal surgery. The volume of removed tissue (bowel segment itself and the surrounding areas) is the same in both methods. Moreover, according to the results of studies using laparoscopic technology, long-term results do not show worse survival rates compared to conventional operations [9, 10, 11, 12, 15].

In surgical intervention on the rectum, there is the logic of combining laparoscopic approach with the conventional including the traditional ways of doing perineal phase of the operation (abdominal-perineal extirpation, abdominal-anal resection) combined with mobilization of the rectum from the abdominal cavity using laparoscopic techniques.

Material and methods. The results of treatment of 25 patients with colorectal cancer who were managed in the abdominal surgery department of "Vitebsk Regional Clinical Oncology Center" from April 2015 to April 2016, and underwent surgery using laparoscopic techniques are presented. All patients had histopathological confirmation of their diagnosis. 25 laparoscopic procedures were performed, including: men - 10, women - 15. The median age was 62.33±2.27 years.

Laparoscopic surgeries included: resection of the sigmoid colon - 9 operations, low anterior resection of the rectum - 6 operations, a standard left-sided hemicolectomy - 2 operation, right-sided hemicolectomy - 6 , resection of the rectosigmoid colon - 2 .

In one case, for the mobilization of the left colon, the mesentery was dissected using solid-state pulsed laser for endoscopic applications "Fotek LK-50" ("Mediola-

Endo" PUE "Fotek" Republic of Belarus) with wavelength of 1.064 microns, the pulse repetition frequency at the maximum radiated power - not more than 50 Hz. The volumes of removed organs and surrounding tissue were according to national standards of diagnostics and treatment of malignant tumors.

According to the degree of cancer differentiation, the distribution was as follows: adenocarcinoma Grade II - 16 patients, adenocarcinoma Grade III - 7, adenocarcinoma Grade I - 2 patients. In 12 patients, there were regional lymph node involvements. Stages of the disease are presented in Table 1.

Table 1

Distribution of patients in stages

Stage of disease for Dukes	TNM classification	The number of patients in stages TNM	Total
I stage Dukes A	T2N0M0	3	3
Stage II Dukes B	T3N0M0	1	9
	T4aN0M0	8	
Stage III Dukes C	T2N1M0	1	12
	T3N1M0	1	
	T4aN1M0	8	
	T4bN1M0	2	
Stage IV Dukes D	T4N1M1	1	1

Total: 25

To perform laparoscopic operation patients were placed supine on the operating table with the lower limbs in supports fixed to the operating table to ensure flexion at the hip and knee joints. The operating team consisted of a surgeon, two assistants, one of whom was the ‘cameramen’, surgical nurses and anesthetic team. The surgeon usually located to the right of the patient, first assistant - on the left, a second assistant - with a video camera at the head end of the operating table. Monitor was located at the feet of the patient. The operations were performed under endotracheal anesthesia with or without combination with spinal anesthesia. To gain operative access to the abdominal cavity 4-5 trocars were used with their placements shown in Fig. 1.

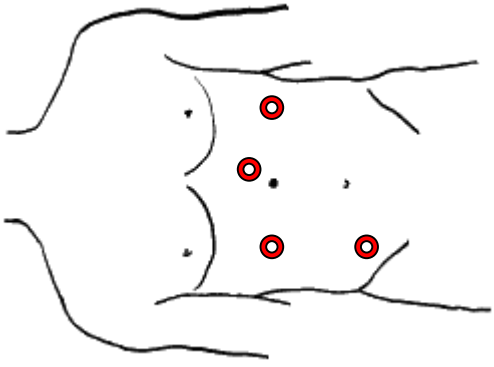

Fig. 1. Location trocars during the operation in the rectum.

An incision is made 1-2 cm above the umbilicus, the first 10 mm trocar is set up and the abdominal cavity is insufflated with gas. The laparoscope is then introduced through this trocar. A review laparoscopy is performed to detect distant metastases in the abdomen. In their absence, two (d-5 d-mm or 10 mm) trocars are placed the right and left areas mesogastric regions. Another trocar (d-10 mm) is inserted into the right iliac region for the introduction of manipulators.

Surgery was performed in the Trendelenburg position with the table tilt of 25-30 degrees. The Trendelenburg position allows easy manipulation of the greater omentum and small bowel loop in the direction of the diaphragm, and thereby unhindered access to the pelvis. Every laparoscopic intervention in the rectum should begin with the identification of the left ureter. To do this, the operating surgeon opens the peritoneum of the left side channel at the base of the sigmoid colon and visualize the left ureter. Then the inferior mesenteric artery and vein are visualized at its origin and ligated with: LIGACLIP, " LigaSure" device or" Harmonic" .

Inferior mesenteric vessels were dissected after visualization, mobilization and clipping with metal clips or using "LigaSure" device or" Harmonic".

With the help of the coagulating hook or ultrasonic scissors dissection of the pelvic peritoneum and mobilization was carried out following the principle of TME. The distal resection margin was stapled and transected with the "EndoGia" stapler introduced through a 12 mm trocar.(Fig. 2).

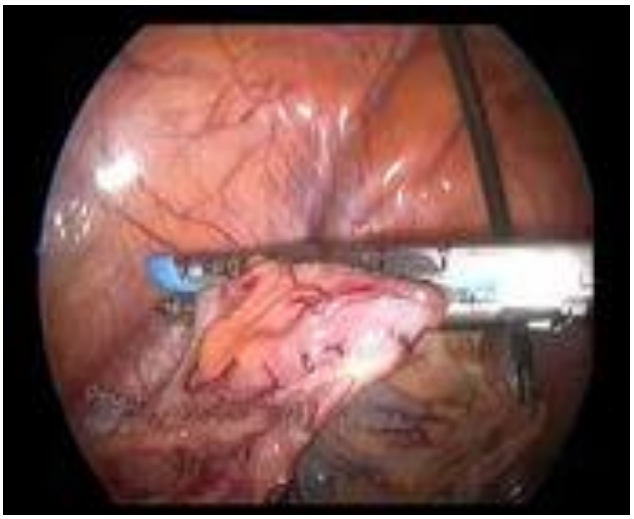

Fig. 2. rectum below the tumor Sewing stapler "EndoGia".

Then a minilaparotomy access is established in the suprapubic or the left iliac region, through which the tumor is extracted and resected. On the proximal segment of the colon, a purse string suture is placed in colon around an inserted circular stapler head, and then in the abdominal cavity, a circular "end to side" anastomosis is formed (Fig. 3) .

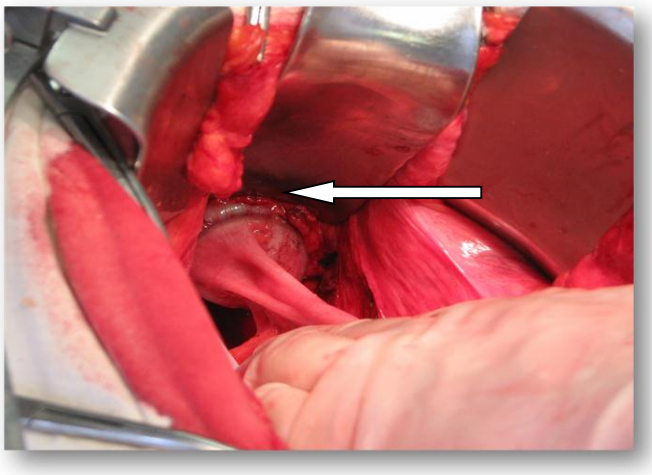

Fig. 3

A circular stapler is introduced into the rectal stump by an assistant. We used staplers from "KANGDI», a Chinese company.

An abdominal drain with aspirator was placed through one of the trocar access incisions and the minilaparotomy incision is sutured.

Results and discussion .After analysis of the implementation of the first interventions, the results obtained are shown in Table 2.

Table 2 - Results of surgical treatment

Operation time **(M±σ)**.	Blood loss, ml (M±m)	complications Clavien degree I,%	% rate of conversion	% postoperative mortality rate
197.6±10.9	110±19.3	30	8	0

Based on these data we conclude that with the increasing acquisition of laparoscopic surgical skills, the duration of surgery will approximate the duration of open method.

There was conversion to laparotomy in two cases, in one patient, during mobilization the splenic flexure of the colon, tumor invasion into the wall of the stomach and the tail of the pancreas was noted. At laparotomy, a combined intervention with removal of the adjacent organs was performed. the patient spent 24 hours in intensive care and the postoperative period was uneventful and the patient was discharged on the 9th day. In the second case, there was involvement in the left ureter with resultant intraperitoneal resection of rectosigmoid colon and resection of the involved part of the ureter and urinary tract reconstruction. The patient spent 48 hours in the intensive care unit. The patient had preventive external ureterostomy with a ureteral catheter that was removed on the 12th postoperative day. The patient was discharged on the 14th postoperative day, with the urinary catheter in the urethra.

Formation of intestinal anastomosis was performed extracorporeally and intracorporal ways. The data presented in Table 3.

Table 3

Type of transaction	Extracorporeal manual Anastomosis	intracorporeal anastomosis stapler with manual control	stapler
resection of the sigmoid colon	8		1
low anterior resection of the rectum		5	1
left-sided hemicolectomy	2		
resection of the rectosigmoid colon	2		
right-sided hemicolectomy	5		

Patients undergoing laparoscopic interventions had significantly reduced postoperative pain. Less intraoperative trauma leads to an earlier restoration of bowel function and thus more rapid rehabilitation of patients.

The principles of cancer surgery were adhered to during laparoscopic interventions, no different compared to the open operating technique with resection of the tumor together with the regional lymph nodes to enhance adequate pathological staging of the disease adequate treatment. [8, 9, 10,12]

There were no severe complications of surgical and therapeutic nature but the sample size is small so we cannot make any generalizations.

Conclusion. Our initial experience shows that the use of laparoscopic-assisted interventions on colonic and rectal malignant neoplasms is reasonable and appropriate and results in fewer postoperative complications (in agreement with published literature), reduce the severity of postoperative pain and decrease requirements for opioid analgesics. Laparoscopic techniques allow performance of surgical intervention in compliance with all the principles of cancer surgery, providing the necessary volumes and resection margins.

REFERANCES

1. 1. Кохнюк, В.Т. Колоректальный рак / В.Т. Кохнюк. - Минск.: Харвест, 2005. - 384 с.
2. 2. Имянитов Е.Н. Клинико-молекулярные аспекты колоректального рака: этиопатогенез, профилактика, индивидуализация лечения//Практическая онкология-2005-№2.-Т.6.-С.65-70
3. 3. H.Jaap Bojer,M.D., Ph.D.,Charlotte L. Dejen, et al. A Randomized Trial of Laparoscopic versus Open Surgery for Rectal Cancer//The New England Journal of Medicine.-2015.-372:1324-1332 April 2,2015

4. 4. Денисенко, В.Л. Проблемы и перспективы хирургического лечения острых осложнений колоректального рака // В.Л. Денисенко, Ю.М. Гаин, С.В. Шахрай / Вестник Национального медико-хирургического центра им. Н.И. Пирогова. – 2012. – № 3, т.7. – с. 36-43.
5. 5. Суконко, О. Г. Статистика онкологических заболеваний в Республике Беларусь / О. Г. Суконко, А. Е. Океанов, П. И. Моисеев, Л. Ф. Левин //Минск:РНПЦ ОМР им.Н.Н.Александрова,2015.-204 с.
6. 6. Шелыгин Ю. А., Ворбьёв Г.И., Фролов С.А. Техника лапароскопических операций при раке толстой кишки.//Практическая онкология .Т.6,№2-2005
7. 7. Шелыгин Ю. А.,Ворбьёв Г.И.Фролов С.А.,Лощинин К.В.,Сушков О.И. Лапароскопические операции у больных раком прямой кишки//Практическая онкология.Т.№.№2-2002.
8. 8. Карачун А.М.,Петров А.С.,Самсонов Д.В.,Петрова Е.А. Место лапароскопических операция при раке ободочной и прямой кишок//Практическая онкология-2012 - №4. - Т13. - С 261.
9.
10. 9. Anderson C., Uman G., Pigazzi A. Oncologic outcomes of laparoscopic surgery for rectal cancer: a systematic review and meta-analysis of the literature//European Journal of Surgical Oncology 2008.-P- 1135-1142.
11. 10. Воробьёв Г.И., Шелыгин Ю.А., и др. Непосредственные результаты лапароскопических передних резекций прямой кишки по поводу рака//Эндоскоп.хир.-2003.-№1.-С14–19
12. 11. Воробьёв Г.И.,Шелыгин Ю.А.,Фролов С.А и др. Лапароскопические операции у больных раком прямой кишки(сравнительные результаты лапароскопических и открытых передних резекций)//Хирургия-2003 -№3.-С.36-42
13. 12. Yu-Wei Wang.,Li-Yong Huang.,Cheng-Li Song. et al.Laparoscopic vs open abdominal resection in the multimodality management of low rectal cancer//World J Gastroenterol 2015 Sep,21(35):10174-83.
14. 13. Фёдоров В.Д., Воробьёв Г.И.,Ривкин В.Л. Клиническая оперативная колопроктология: руководство для врачей/М.:ГНЦ проктологии ,1994г.
15. 14. Ramos J.R. Laparoscopic abdominoperineal resection//New trends in coloproctology. J.A.ReisNeto.- Livraria e Editora Rewinter,2000.-Vol.-P457-472.
16. 15. Lecbaux D.,Trebucbet G.,Le Calve J.L. Five-year results of 206 laparoskopic left colectomies for cancer//Surg.Endoscop.-2002.-vol.16.-P.1409-1412.