

EARLY PERIOPERATIVE RESULTS IN 53 CASES OF LOCALLY RECURRENT COLORECTAL CANCER

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ABSTRACT

PURPOSE: The objective of this study was to analyze retrospectively the early perioperative results in a cohort of 53 patients with locally recurrent colorectal cancer (CRC).

MATERIAL AND METHODS: The study covered 53 patients with CRC 21 males and 32 females at a mean age of 62 years treated in the Clinic of Liver, Biliary, Pancreatic and General Surgery, Tokuda Hospital of Sofia, during the period from January 2007 to March 2013. Any necessary diagnostic and surgical methods were applied.

RESULTS: The locally recurrent CRC is a challenge for the surgeon because of the fact that in most cases it engages adjacent anatomical structures and organs, on the one hand, and it is accompanied by complications, on the other hand.

CONCLUSION: Achievement of good late results in patients with recurrent CRC is due to radicality of the interventions. Most often, they should be multivisceral resections. The presence of intestinal obstruction of varying degree and of synchronous peritoneal and liver metastases commonly limit the possibilities for surgical interference with the disease. Particular attention should be paid to possible neoadjuvant treatment capable of reducing the stage of disease and improving the perioperative outcomes. Therapeutic behaviour should be strictly individual and consider any possible options. The experience of the surgical team is extremely important, too.

Key words: colorectal cancer, adenocarcinoma, locally recurrent tumour, multivisceral resection, perioperative outcomes

INTRODUCTION

Approximately 40% of all the patients undergoing surgery often develop distant colorectal cancer (CRC) recurrence. Locoregional recurrence as the first manifestation of the disease is less common - in 10-20% of cases (12). The mechanism of local recurrence is most often associated with residual tumour or lymphogenic transmural distribution. Last but not least comes the local

implantation. Surgery remains the major treatment method. Pursuit of clean resection lines is essential for good late results. In a large percentage of the cases the delivery of surgical intervention is involved for complications caused by local recurrence - varying in severity, intestinal obstruction, perforation with abscess breakthroughs in neighbouring organs, etc., and such urgency is combined with distantly disseminated disease. This is usually the subject of intervention by a multidisciplinary surgical team.

MATERIAL AND METHODS

The study covered 53 patients with CRC, 21 males (39,6%), and 32 females (61,4%) at a mean age of 62 years (range, 33-83 years) treated in the Clinic of Liver, Biliary, Pancreatic and General Surgery, Tokuda Hospital of Sofia, during the period

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from January 2007 to March 2013. Any necessary diagnostic and surgical methods were applied.

RESULTS

Patient's complaints were diverse and heterogeneous. The symptoms and disorders were presented in Table. 1

Table 1. Patients' symptoms and disorders

Symptom	n
asthenodynamia	9
abdominal pain	33
abdominal enlargement	20
weight loss	19
defecation disorders	10
bleeding	8
Nausea and vomiting	8
fever	2
rectovaginal fistula	2
pelvic pain	4
right femoral pain	1
dysuria	2
detected during the control examination	6

**The number of symptoms was greater than the number of patients as some patients presented with more than one complaint*

Abdominal pain syndrome was most common. Because of the local prevalence of cancer relapse with involvement of adjacent organs and anatomical structures, on the one hand, and complications accompanying growth and spread of the formations such as relative or complete intestinal obstruction, tumour abscondense, bloating, upper dyspeptic syndrome, changed bowel habits, on the other hand, reflected the high incidence rate of obstructive intestinal complications. Asthenodynamic syndromes were common and resulted from carcinoma intoxication and anemia associated with this disease. Pelvic pain, rectal hemorrhage, rectovaginal fistula and dysuria were complaints that accompany rectal cancer recurrences. In 6 patients (11,3%), there was a relapse during a routine checkup to monitor the disease and the patients did not report any complaints.

When analyzing the preoperative data it was noteworthy that 28 patients (52,8%) presented with anemic syndrome of different degree. This fact could be due to occult bleeding in the lower part of

the gastrointestinal tract (only 8 patients reported episodes of rectal hemorrhage) and to intoxication of the organism by the developing recurrent tumour.

Upon admission, physical examination determined the size of tumour formation, location, urgency, and presence of distant dissemination. During the examination, there was no evidence of palpable tumour formation in 13 patients (24,5%). Eleven patients (20,7%) presented with a clinical picture of emergent intestinal obstruction. In 13 patients, other complaints were related to the relative intestinal obstruction and intraoperatively detected typical signs such as partial stenosis of the lumen of the intestine and relative dilatation of the proximal bowel segment. In 23 patients (43,3%) there was evidence of intestinal obstruction of varying degree. It was intraoperatively established that the reason for this was an obturation of the intestinal lumen of relapsing tumour formation, infiltration in the vicinity of the small intestine or the infiltration of the small intestine of peritoneal metastasis accompanying the local relapse. Table 2 showed the complications caused by relapsing tumour formation. It was noteworthy that in 31 patients (58,4%) the relapsed CRC was accompanied by complications at diagnosis.

The time span between the previous operation and the diagnosis of locally recurrent disease in 48 patients was 4-50 months. In 5 patients, 'the brightest period' was more than 5 years. They were included in the group of disease recurrence as intraoperative localization was established in the place of the previous intervention. They could develop metachronous CRC, which was difficult to differentiate from relapse. With the remaining patients, the average photoperiod was 24,6 months.

Table 2. Complications caused by relapsing tumour formation

Complications	n
complete intestinal obstruction	11
relative intestinal obstruction	13
pericolic abscess	2
rectovaginal fistula	2
neuralgia and paresis of <i>n. femoralis dex.</i>	1
tumour-vesicular fistula	1
tumour-parietal fistula	1
ileocolic fistula	1

Localizations of CRC relapse were presented in Table 3.

Table 3. Localizations of CRC relapse

Localization	n
ileotransversal anastomosis	8
sigmoid-rectal anastomosis	22
rectum	4
left hypochondrium	4
solon sigmoideum	2
right hypochondrium	3
right retroperitoneum	4
pelvis	4
colon transversum	1
colostomy	1

Local recurrences were most common in the anastomosis between the sigmoid colon and the rectum. The localizations in the left colon and the pelvis (previous interventions on the left colon and rectum) prevailed - in 37 patients (69,8%). The patients with other sites of disease were those with colonic relapse in the ileotransversostomy right after hemicolectomy. Other locations were relatively less common - retroperitoneal space right on the place of right colon removed, similar location, but in the left hypochondrium on place of the intervention on the left flexure of the colon. It is noteworthy that only in one patient there was a recurrence after resection of isolated transverse colon and previous transverso-transversostomy. One patient relapsed in descendostomy done in the past.

CRC incidence rate is proportional to increasing age. Most of the patients are older and have concomitant diseases, which along with the severity of cancer and perioperative complications further increase the risk. Classified by number of patients with a chronic concomitant disease requiring treatment, only in 14 patients (26,4%) there was no evidence of any underlying diseases. Naturally, the most common concomitant disorders are those of the cardiovascular system.

Among the patients that underwent surgery, 24 palliative and 29 potentially curative operations were done. The term of 'potentially curative' denoted those in which resection/extirpation of local recurrence and/or solitary liver/peritoneal metastases without macroscopic residual tumour

tissue and strive for clean resection lines was carried out. The classification of the transactions used as the main criteria - palliative/potentially curative operations and the topic of local recurrence - upper or lower abdominal floor, and supra- or inframesocolic, respectively, are shown in Table 4.

When commenting these results, we should mention that most palliative surgical interventions were carried out under conditions of urgency - mainly in patients with clinical and instrumental evidence of bowel obstruction. Intestinal obstruction was due to occlusion of the intestinal lumen of local recurrence - the cases of colonic ileus or infiltration from outside the casing of local recurrence and/or peritoneal metastases, mainly in small bowel. In 10 patients small intestinal resections regarding involvement of the small bowel and small bowel obstruction were performed. The main reason for taking palliative measure was the intraoperative detection of multiple peritoneal metastases and/or multiple liver bilobar methastases, those that were not visualized on preoperative imaging or in combination with other complications requiring laparotomy. Locally advanced formations engaging the main vessels such as aorta, truncus coeliacus, upper mesenteric artery, and lower caval vein are indications for the performance of palliative surgery or exploratory laparotomy due to the inability to achieve clear resection lines or high surgical risk interventions in the upper abdominal floor.

The locally advanced recurrent tumours after bowel resection of the left colon and rectum were indications for palliative interventions in the lower abdominal floor. The main indications were local involvements of the main vessels such as aorta, iliac arteries, veins, the infiltration of the pelvic bones, and the multiple peritoneal and/or liver metastases. In these cases it not possible to achieve pure resection lines. In most cases, a palliative intervention in the lower abdominal floor after colostomy provided gastrointestinal passage. Colostomy alone or in combination with another procedure were made as a palliative surgery in 13 patients. In two patients, only palliative Hartmann's resection for chronic rectal hemorrhage was performed.

Potentially curative surgical interventions in recurrent disease in the upper abdominal floor and

Table 4. Palliative surgery in the abdomen

Palliative interventions			
upper abdomen	n	lower abdomen	n
ileotransversal bypass	2	colostomy	8
small bowel resection	3	small bowel resection	2
exploratory laparotomy	2	small bowel resection + colostomy	3
ileostomy	1	Hartmann's resection+ small bowel resection	2
		exploratory laparotomy	1

the number of affected neighbouring organs and anatomical structures were presented in Table 5. With one exception, there was local invasion of the tumour in all the cases. In the absence of distant dissemination, multiple liver metastases and infiltration of main blood vessels, multivisceral resections were performed as an attempt to achieve surgical radicality. Anatomical location of the tumour recurrences in the upper abdominal floor often involved the retroperitoneal space, duodenum, pancreas, spleen, diaphragm, stomach, and abdominal wall vessels. Multivisceral resection in these cases was complex and required experience in liver, biliary and pancreatic surgery. It was associated with a higher perioperative risk.

Potentially curative surgical interventions in recurrent disease in the lower abdominal floor and the number of affected neighbouring organs and anatomical structures were presented in Table 6.

Here belonged the processes distally from the left flexure of the colon.

Tumour formation was isolated in the colon in one patient only. Most recurrences occurred at the site of the previous intervention carried out. The urinary bladder, uterus with adnexa and vagina were most commonly affected. Small intestine infiltration was often observed, too.

Performance of multivisceral resection was further complicated by multiple peritoneal adhesions requiring total debridement before selecting the type of the intervention. Access to the pelvis was often further compromised by postradiation fibrosis. With multivisceral resections one should identify the anatomical structures away from the borders of relapsing macroscopic formation, e.g. ureter, iliac arteries, veins, aorta, lower caval vein, superior mesenteric vessels as well as the possibility of clamping them in case of hemorrhage. With surgery for CRC

Table 5. Potentially curative surgical interventions in recurrent disease in the upper abdominal floor

Interventions	Organs
duodenectomy, small bowel resection, large bowel resection, partial pancreatic resection, retroperitoneal relapsing tumour extirpation	5
retroperitoneal relapsing tumour extirpation, small bowel resection, ileoascendostomy, abdominal wall excision	4
right hemicolectomy, gastric resection, partial pancreatic resection	3
subtotal colectomy, partial radix mesenterii resection, liver metastasectomy	3
splenectomy, pancreatic resection, resection of the diaphragm, liver metastasectomy	4
liver resection, small bowel resection, large bowel resection, pancreatic resection	4
small bowel resection, colon transversum, cholecystectomy, duodenal resection, pancreatic resection, liver metastasectomy	6
retroperitoneal relapsing tumour extirpation	1
ileotransversostomy resection, capsula adiposa kidney resection	2
retroperitoneal relapsing tumour extirpation + capsula adiposa kidney resection	2
left hemicolectomy + abdominal wall resection	2
transverse colon resection, liver resection, abdominal wall excision, capsula adiposa kidney resection, resection of the diaphragm	5

Table 6. Potentially curative surgical interventions in recurrent disease in the lower abdominal floor

Interventions	Organs
rectosigmoid Hartmann's resection, retroperitoneal tumour infiltration excision	2
rectosigmoid resection, urinary bladder resection, small bowel resection	3
sigmoid colon resection, small bowel resection, hysterectomy	3
abdominoperineal Miles' resection, vaginal resection	2
abdominoperineal Miles' resection, vaginal resection	2
rectosigmoid Hartmann's resection, presacral fascia excision	2
abdominoperineal Miles' resection, vaginal resection	2
RRA, small bowel resection	2
left hemicolectomy	1
abdominoperineal Miles' resection, urinary bladder resection, small bowel resection, cecumectomy	4
rectosigmoid Hartmann's resection, urinary bladder resection	2
rectosigmoid Hartmann's resection, hysterectomy, vaginal resection, urinary bladder resection	4
retroperitoneal relapsing tumour extirpation (<i>fossa iliaca dex.</i>), small bowel resection, parailiac-paraaortal lymph node dissection, iliac bone periost	3
pelvic relapsing tumour extirpation, urinary bladder resection	2
abdominoperineal Miles' resection, retroperitoneal tumour excision	2
RRA, hysterectomy, urethral resection, small bowel resection, liver metastasectomy	5
left hemicolectomy, small bowel resection, urinary bladder resection, hysterectomy	4

in the pelvic area, it is often necessary to perform a two-stage operation with passage interruption. On the one hand, preventing the possible passage would interfere with the occurrence of a new relapse, and on the other hand, complications of adjuvant radiotherapy are possible. The volume of resection of adjacent organs is usually determined by express histological examination of the resection lines.

Multidisciplinary approach to the planning of operations, especially in the pelvis, is important. Preoperative placement of ureteral prosthesis of type JJ and cystoscopy directly visualizing the possible involvement of the urinary bladder is often required.

The duration of surgery in our patients was between 80 and 510 min.

Perioperative outcomes

The average hospital stay was 9,5 days. One patient died of multiple organ failure. Perioperative mortality rate was estimated at 1,85%. Perioperative morbidity was 24%. Complications were observed in 13 patients.

Perioperative complications

Table 7 showed that the most frequent complication was suppurative surgical wound associated with the nature of the surgery. Partial insufficiency, vesicovaginal fistula, prolonged postre-

sectional hematuria were related to intervention in the pelvic area. Lesion of the right femoral nerve was due to its commitment of relapse in the right iliac fossa that was extirpated. Interestingly, there were no complications associated with perioperative multivisceral resections in the upper abdominal floor.

Table 7. Perioperative complications

Complications	n
wound infection	6
fever, tumour - abdominal wall fistula	1
partial colectostomy insufficiency without reoperation	1
vesicular-vaginal fistula	1
paresis of <i>n. femoralis dex.</i>	1
persistent hematuria	1
hemorrhagic stroke with right hemiparesis	1
postoperative ileus	1

The disease was histologically verified in all the patients. A moderately differentiated adenocarcinoma G2 was found out in 37 patients (68,5%) and a recurrent low differentiated carcinoma G3 was observed in 12 ones (22,2%). Only 5 cases (9,2%) were verified as highly differentiated adenocarcinoma. The ratio of tumour cell differentiation did not show

any significant difference with that in the primary locally advanced colon adenocarcinomas.

In 26 cases after multivisceral resection, a histologic infiltration of neighbouring organs and anatomical structures was demonstrated. Only three patients presented with macroscopic involvement without any histological verification.

DISCUSSION

Due to limited space in the human pelvis, local recurrences after rectal operations occur more frequently than in other CRC localizations. Moreover extensive resection lines are easily achieved in large bowel operations than in rectum resections and wherein sparing the physiological defecation is important (17). Therefore, the location of the primary tumour is very important for the locoregional recurrences. Rectal tumours relapse locally with greater frequency, while distant relapses prevail in other sites (3,16). According to some reports, patients with clinical evidence of ileus and perforation recur with a frequency of 42% and 44%, respectively (10). Basic mechanisms of local recurrence include unradical resection of advanced primary tumour, transmural, mural and lymphogenic local dissemination, and local tumour implantation (13). The average time from the primary surgery to the diagnosis of disease relapse according to some authors is 24 months (2,18), while other report 21,3 months (10). The data in our series (24,6 months) show no difference in time to disease relapse. Some aggressive tumours can recur within 6 months (19).

Surgery for recurrent CRC is aimed at removing the tumour formation in clean resection lines whenever possible or as palliative measure in cases of incurable disease. Clear indications for surgery are ileus, bleeding and perforation. In any other cases, the approach should be strictly individual. The patient should be informed about the benefits, risks and operational options (6).

Patient's motivation is extremely important. All the cases of interventions for recurrent CRC require informed consent for colostomy removal. The detailed evaluation of patient's general status and his/her comorbidities is mandatory.

Surgery for recurrent rectal adenocarcinoma

The detection of disease in the vicinity of a skeleton of the pelvis as well as the essential

anatomical structures often limit the ability to achieve a clean resection lines (11). Central recurrences typically involve neorectal anastomosis and relapsed perineal abdominoperineal rectal extirpation. Front recurrences affect uterine cervix or vagina in females and urinary bladder, seminal vesicles and prostate in males.

Rear recurrences usually affect the sacrum. Lateral recurrences are most unpleasant and affect the neurovascular and bony structures of the lateral walls of the pelvis. Relapses are often combined (4,9). Similarly to the contraindications for performing the resections in relapses within the rectum mentioned above, some authors report that the presence of distant metastasis, lateral recurrence, infiltration of the iliac vessels, edema of lower limbs, hydronephrosis, sacral infiltration in S2, peritoneal carcinomatosis and severe comorbidities belong to the contraindications, too (5,6). Most patients of ours following multivisceral resections presented with frontal and central recurrence. Resections of anastomoses constructed en block in the previous operation used a wall of the urinary bladder, uterus, vagina and other infiltrated tissues and organs. A long-term survival should be expected only in the patients in whom radical surgical resection and clean lines could be achieved. The presence of positive lines and macroscopic tumour residual lines corresponds to the cases without any therapy (1,15). Patients with unresectable pelvic recurrences or wide dissemination of the disease benefit from ileo/colostomy (6). Multimodal therapy significantly improves the prognosis. Studies of the use of high preoperative radiotherapy achieve complete response at 2-9% reduction in stage in 30-65% of the cases (14). The application of intraoperative and preoperative radiotherapy further enhances survival rates.

Surgery for recurrent colonic cancer

Locoregional recurrence in colonic cancer can be categorized into 4 groups, mainly according to the relapse: i) perianastomosal (mural) recurrence; ii) mesenteric (through regional lymph nodes); iii) retroperitoneal (transmural, distant lymph nodes), and iv) peritoneal (2,3,12). The most frequent relapse is perianastomosal (2,18). This is the most frequent recurrence reported in our series, which covers the tumour anastomosis itself and peritoneal

structures nearby. In all cases of disease recurrences are managed by the principles of oncologic surgery - the maximum anatomical representation of adjacent anatomical structures, hemostasis and minimal trauma to tumour formation. The performance of en block tumour resection without affecting adhesion is extremely important (7). In all the cases of adherent parietal peritoneum of the abdominal wall formation one should perform a wide excision not only of peritoneum, but also of muscle-aponeurotic layers. Recovery after the excision does not seem to be a problem, and for large defects substitution polypropylene mesh implantation is used. Anatomical pancreatic resection with engagement of the body and the tail of the gland was preferably performed while partial resection was preferred for head involvement. Stomach and liver engagement was usually treated with atypical resection. Postresectional defects of the diaphragm (usually in the left side) could relatively easily be recovered. Colonic resection per se should be performed in a wide range and at least of 5-cm resection clean lines where necessary (6). Similar early perioperative outcomes were reported in two series of patients undergoing surgery for locally recurrent CRC, where the average operative stay was 9 days, perioperative morbidity rate was 24% and mortality rate was 1% (2,18).

CONCLUSION

Performing radical surgery for CRC relapse is directly linked to later outcomes in these patients. The presence of multiple adhesions, altered anatomical dissection of plans and need to carry out multivisceral resections are a challenge for the surgeon. Perianastomotic recurrences without distant multiple disseminations are most favourable for radical surgical interference. It is imperative that the implementation of en block resection without affecting the tumour adherent to the structures of the volume of resection can express the histological samples used. In the intraoperative findings of disseminated disease, the performance of cytoreductive operations is justified only as a means of influencing such a complication. Hartmann's resection of the rectum for treatment of chronic hemorrhage. Particular attention should be paid to possible neoadjuvant treatment capable of reducing the stage of disease and improving the perioperative

outcomes. Therapeutic behaviour should be strictly individual and consider any possible options. The experience of the surgical team in pelvic, liver, biliary and pancreatic surgery is extremely important, too.

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