

## Multi-organ Resections for Colorectal Cancer: Analysis of Potential Factors with Role in the Occurrence of Postoperative Complications and Deaths

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### Rezumat

#### **Rezecțiile multiorgan pentru cancer colo-rectal: analiza factorilor ce ar putea influența morbiditatea și mortalitatea postoperatorie**

**Scop:** Efectuarea rezecțiilor multiorgan pentru neoplasmale colo-rectale reprezintă o temă de actualitate prin problematica pe care o ridică: beneficii versus morbiditate crescută. În lucrarea de față am urmărit identificarea factorilor ce pot influența apariția complicațiilor și deceselor postoperatorii după rezecții multiviscerale.

**Material și metodă:** Au fost incluși în studiu 107 pacienți internați în Clinica Chirurgie III, Cluj-Napoca, supuși rezecțiilor multiviscerale pentru patologie oncologică colo-rectală. Studiul este retrospectiv, între anii 2006-2010. În lucrarea de față am comparat morbiditatea și mortalitatea consecutivă rezecțiilor multiorgan pentru cancer colo-rectal local avansat, cu rezultatele obținute la pacienții cu rezecții colo-rectale simple. De asemenea, am încercat să evidențiem relațiile pe care o serie de factori le au cu complicațiile postoperatorii.

**Rezultate:** Studiul nostru indică o incidență mai mare a complicațiilor și deceselor postoperatorii în cazul rezecțiilor multiorgan, diferențele fiind semnificative din punct de vedere statistic. Complicații postoperatorii: 26% după rezecții multiorgan, respectiv 14% după rezecții simple

( $p=0.001$ ). Decese postoperatorii: 11% după rezecții multiorgan, respectiv 3% după rezecții simple ( $p<0.001$ ). Factorii ce au influențat negativ evoluția postoperatorie au fost: diabetul zaharat, antecedentele personale de boală malignă, patologia cardiacă asociată, intervențiile chirurgicale abdominale majore în antecedente, numărul crescut de organe rezecate și pierderile peste 500 ml de sange intraoperator.

**Concluzii:** În cazul neoplasmelor colo-rectale local avansate, indicația rezecțiilor multiorgan trebuie să devină un standard, oferind bolnavilor singura șansă la o supraviețuire comparabilă cu cea obținută în stadiile mai puțin avansate. Acest lucru este susținut de rata mare de rezecabilitate (R0) obținută în serviciul nostru. Compensarea preoperatorie a tarelor asociate, intervenția chirurgicală efectuată de către echipe experimentate, precum și asigurarea unei terapii intensive corespunzătoare sunt obligatorii pentru a reduce riscurile postoperatorii.

**Cuvinte cheie:** cancer colorectal, invazie locală, rezecții multiorgan, morbiditate, mortalitate

### Abstract

**Aim:** Multi-organ resection for colorectal malignancy is a topic of interest nowadays as it raises the issue of benefits versus increased morbidity. This study aims to identify factors that may influence the development of postoperative complications and death following multivisceral resection.

**Methods:** The study included 107 patients hospitalized in the Surgical Clinic III of Cluj-Napoca, who underwent multivisceral resections for colorectal cancer pathology. This is a retrospective study covering the period between 2006 and 2010. This study compares the morbidity and mortality

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following multi-organ resections for locally advanced colorectal cancer, with results in patients with uncomplicated colorectal resections. The study also highlights the impact that certain factors have on the development of postoperative complications.

**Results:** This study shows a higher incidence of death and postoperative complications in the case of multiorgan resections. The differences were found to be statistically significant as follows: postoperative complications: 26% after multiorgan resection and 14% after uncomplicated resection respectively ( $p = 0.001$ ); postoperative death: 11% after multi-organ resection and 3% after uncomplicated resection respectively ( $p < 0.001$ ). The factors that have influenced in a negative way the postoperative evolution of the patients were: diabetes, personal history of malignant disease, associated heart disease, major abdominal surgery prior enrolling, the number of resected organs and increased intraoperative blood loss (over 500 ml).

**Conclusion:** In cases of locally advanced colorectal neoplasm, multiorgan resection should become the standard indication, as it offers patients their only chance of survival, comparable to that obtained in less advanced stages of the disease. This indication is underlined by the high resectability rate (R0) accomplished in our service. Preoperative compensation of the associated pathologies, the surgery performed by experienced teams, as well as providing an adequate intensive care are required to reduce the postoperative risks.

**Key words:** colorectal cancer, local invasion, multiorgan resection, morbidity, mortality

## Introduction

Currently, the colorectal cancer is the most common gastrointestinal malignancy, representing the third leading cause of cancer death after lung and breast cancer (1). The management of this condition requires a multidisciplinary approach, which is mandatory in order to make the correct diagnosis and ensure the optimal treatment and an adequate surveillance and follow-up. The most frequent location of colorectal neoplasia is the rectum and the sigmoid colon, followed by the cecum and the ascending colon. In these areas, the tumor is likely to invade the neighboring organs (2). Thus, 10% of the patients with colorectal neoplasia have tumor invasion of adjacent viscera. The current treatment guidelines recommend tumor resection with en bloc resection of invaded organs for such cases, provided that R0 resection margins are ensured (3,4,5,6). Despite these recommendations, multiorgan resection is not always performed as the indication of surgery is influenced by the fact that surgeons try to avoid a possible increased incidence of postoperative complications.

According to studies in specialty literature, multiorgan resection provides an opportunity for survival comparable to that obtained after resection in patients with T3 neoplastic

disease. Therefore, radical surgical treatment are required for the patients in whom tumor enlargement places them in T4 (7).

## Method

The purpose of this study is to reveal whether there are factors that influence the occurrence of postoperative complications and perioperative mortality after multivisceral resection for locally advanced colorectal cancer. Locally advanced colorectal cancer is diagnosed when the tumor invades or is closely adherent to at least one neighboring organ, but without signs of distant metastasis. This study considers multiorgan resection as being the surgical resection involving at least one organ, in addition to the primary organ affected by the neoplastic disease.

During the period 2006-2010, in the Surgical Clinic III, from Cluj-Napoca, 1860 patients with colorectal cancer were diagnosed and surgically treated. Out of them, 146 underwent multi-organ resection. In 39 cases liver metastases were present in which, in addition to the primary tumor resection, liver resection was performed within the same operating time. These patients were excluded from the present study, considering that their neoplastic disease was already systemic.

As a first step, the occurrence rate of postoperative complications and the perioperative mortality were determined, using two groups: the group of patients with multivisceral resection (A,  $n = 107$ ) and the group of patients with uncomplicated colorectal resection (B,  $n = 1714$ ).

In the second part of the study, mortality and morbidity after multiorgan resections were analyzed. In these cases, the study also examined how mortality and morbidity were influenced by a number of intrinsic and extrinsic factors.

The following were considered minor postoperative complications that did not require long-term therapy (except for analgesics, antipyretics, antidiarrheal drugs, anti-inflammatory drugs): the febrile resorption syndrome, the diarrhea syndrome, the postoperative parietal pain syndrome, urinary complications, postoperative parietal hernia, parietal suppuration. The following were medium complications that led to the prolongation of the period of hospitalization, requiring a treatment, in order for the patient's life not to be endangered: the anastomotic fistula, evisceration, bleeding, intra-abdominal abscesses. Major complications, such as the ones that follow, has lethal potential: cardio-vascular complications, respiratory complications, sepsis (8). The perioperative mortality included death within 30 days of surgery.

We considered as risk factors related to the patient, the following: age, weight status, associated diseases / pathological personal antecedents (diabetes, cancer history, cardiovascular history, history of major abdominal surgery, pathologic digestive and renal history) and serum biochemical variables recorded at admission, on the day before surgery: hemoglobin (Hb) and total protein (PT).

We took into account the following factors that are related to surgery: type of surgery (emergency or not), tumor size (more than 5 cm), number of resected organs (two organs resected versus more than 2 resected organs), surgery length (operative

**Table 1.** Age of patients with colorectal cancer

| Age              | Multiorgan resection | Colorectal resection  | p       |
|------------------|----------------------|-----------------------|---------|
| Range (years)    | 38-89                | 19-84                 | -       |
| Mean ( $\pm$ SD) | 63,98 ( $\pm$ 10.37) | 66,088 ( $\pm$ 10.96) | 0,054*  |
| > 70 years N (%) | 38 (35,18 %)         | 617 (36 %)            | 0,917** |

\* Student's T-test

\*\* Fisher's Exact Test

time - over 180 min) and blood loss (at least 500 ml). These reference values correspond to the values found in similar studies in the literature, also designed to assess their impact on postoperative outcome (9, 10, 11).

For the statistical analysis we used parametric and nonparametric tests of significance. The association between nonparametric variables was tested using Chi Square Test, Fisher's exact test and odds ratios (OR).

The study of the differences in the values of quantitative variables in two independent groups was performed by Student T-test with equal variances; the variances were tested in advance with Levene test.

In all the tests that were used, the confidence interval was 95% (p-value < 0.05); also it was taken in consideration the bilateral p-value, where tests provided it. For statistical processing we used the statistical calculations and graphics environment R version 2.15.0, with graphic interface Rcmdr version 1.8-3.

## Results

In the present study, the incidence of multiorgan resection for advanced colorectal cancer was 7.84%.

The average age of the patients in group A was 64, being close to that of the patients in group B.

The percentage of patients over 70 years has been similar for both groups (Table 1). When we divided patients with multiorgan resections into two groups (that of patients under 70 years and that of patients over 70 years old), we did not find significant differences between rates of postoperative complications or postoperative deaths. In contrast, the statistical calculations have shown that patients with associated diseases (at least one) are significantly older compared to those without comorbidities

**Table 2.** Tumor location

| Tumor location                                           | N  | %     |
|----------------------------------------------------------|----|-------|
| Sigmoid colon                                            | 38 | 35.18 |
| Rectum                                                   | 22 | 20.37 |
| Descending colon (n=16) / Spleen angle (n=5)             | 21 | 19.44 |
| Ascending colon (n=11) + Cecum (n=4) + Liver angle (n=1) | 18 | 16.66 |
| Transverse colon                                         | 11 | 10.18 |
| Recto-sigmoid junction                                   | 3  | 2.77  |

(mean age  $65.32 \pm 10.01$  vs  $58.10 \pm 10.15$ ;  $p = 0.005$ , T-test); also, patients who died post operatory are significantly older (mean  $71.25 \pm 8.77$  vs  $63.05 \pm 10.24$ ;  $p = 0.009$ , T-test).

22 patients had a body mass index (BMI) over 30 (obese patients). In this group, we found an increased chance of developing postoperative complications (OR=1.32).

In terms of location, the sigma cancer occurred in 40 cases and therefore ranked first, being followed by the rectal (n = 21) and descending colon (n = 16) cancer. Five patients had synchronous cancer (Table 2).

The most involved resected organ, by far, was the small bowel (30 cases). Table 3 gives details on organs that were resected secondarily.

The rate of occurrence of complications following multi-visceral resection was 26%. In the case of colorectal resections, complications occurred in 14%. This difference was statistically significant ( $p = 0.001$ ; Fisher's Exact Test).

In Table 4, the anastomotic fistula and the postoperative wound infection are shown to be the most common postoperative complications for both group A (multiorgan

**Table 3.** Additionally resected organs

| Additionally resected organs | N (%)       | Additionally resected organs | N (%)     |
|------------------------------|-------------|------------------------------|-----------|
| Small bowel                  | 30 (23.25%) | Liver                        | 4 (3.1%)  |
| Uterus / Ovary               | 19 (14.72%) | Gallbladder                  | 4 (3.1%)  |
| Another colorectal segment   | 15 (11.62%) | Kidneys                      | 4 (3.1%)  |
| Spleen                       | 15 (11.62%) | Vagina                       | 3 (2.32%) |
| Stomach / Duodenum           | 11 (8.52%)  | Ureter                       | 2 (1.55%) |
| Urinary bladder              | 8 (6.2%)    | Diaphragm                    | 1 (0.77%) |
| Caudal pancreas              | 6 (4.65%)   | Adrenal gland                | 1 (0.77%) |
| Abdominal wall               | 6 (4.65%)   | -                            | -         |

**Table 4.** Postoperative complications

| Colorectal resection     | N (%)      | Multi-organ resection    | N (%)       | p*     | OR**  |
|--------------------------|------------|--------------------------|-------------|--------|-------|
| Anastomotic fistula      | 53 (3.09%) | Anastomotic fistula      | 11 (10.18%) | <0,001 | -     |
| Parietal suppuration     | 26 (1.51%) | Parietal suppuration     | 16 (14.81%) | <0,001 | -     |
| Eventration/Evisceration | 25 (1.45%) | Eventration/Evisceration | 3 (2.77%)   | -      | 1.948 |
| Pulmonary complications  | 23 (1.34%) | Pulmonary complications  | 8 (7.40%)   | <0,001 | -     |
| Bleeding                 | 22 (1.28%) | Bleeding                 | 2 (1.85%)   | -      | 1.464 |
| Intra-abdominal abscess  | 13 (0.75%) | Intra-abdominal abscess  | 2 (1.85%)   | -      | 2.492 |
| Heart complications      | 12 (0.7%)  | Heart complications      | 7 (6.48%)   | <0,001 | -     |
| Generalized peritonitis  | 10 (0.58%) | -                        | -           | -      | -     |
| -                        | -          | Sepsis                   | 4 (3.70 %)  | -      | -     |
| Urinary complications    | 32 (1.86%) | -                        | -           | -      | -     |

\* Fisher's Exact Test

\*\* OR=odds ratio, calculated for contingency table with cell frequency less than 5

resections) and for group B (colorectal resections). From a statistical viewpoint, there is a significant association between the presence of anastomotic fistula and multiorgan resections ( $p < 0.001$  respectively; Fisher's Exact Test).

Statistical analysis indicates a statistically significant association between pulmonary and cardiovascular complications and multiorgan resections ( $p < 0.001$  and  $p < 0.001$ ; Fisher's Exact Test). From the total of 28 patients with postoperative complications following multi-organ resection, 25 (89%) had associated diseases.

The patients with a prior history of neoplasia had a higher chance of anastomotic fistula occurrence (OR=14.250) and pulmonary complications (OR=9.600); we also noticed an increased chance of producing septic complications and postoperative deaths in this group of patients (OR=5.380 and OR=1.340). (Table 5)

As expected, the association of a cardio-vascular pathology prior to surgery gave rise to an increased rate of occurrence of postoperative cardiac complications ( $p = 0.048$ ; Fisher's Exact Test). (Table 5)

Patients with diabetes mellitus have had a higher risk of postoperative wound infection ( $p = 0.035$ ; Fisher's Exact Test) as well as a higher chance of developing pulmonary complications (OR=6.769). (Table 5)

The presence of major surgical interventions in patient history has increased the chance to develop septic postoperative complications (OR=12.450). (Table 5)

We did not find statistical significance between the personal history of digestive or renal diseases and the occurrence of postoperative complications. Also, in our study, the Hb and PT have not been shown clearly to influence the occurrence of anastomotic fistula ( $p = 0.258$  respectively  $p = 0.054$ ; Fisher's Exact Test). Thus, of the 42 patients with serum Hb values below 10 mg/dl, only 12% have developed anastomotic fistula, compared with 5% of 65 patients with Hb  $> 10$  mg/dl. 22 patients had low values of total protein ( $< 6$  g). Of these, 18% have developed anastomotic fistula compared to 5% of those 85 patients with normal levels of protein.

Regarding the postoperative mortality, a 3.26% incidence of death was found for group B, which was lower than that found in patients with multivisceral resections, in whom the death rate was 11.11%. The higher incidence of death in patients with multiorgan resection was found to be statistically significant ( $p < 0.001$ ; Fisher's Exact Test).

Eleven patients, out of the 12 deceased patients, had associated cardiac pathology at admission. However, we have not managed to emphasize the association between this disease and postoperative death ( $p = 0.271$ ; Fisher's Exact

**Table 5.** The influence of the patients history and associated disease over the incidence of postoperative complication (N=107 patients)

| Pathological patient history       | Postoperative complications | p*    | OR**   |
|------------------------------------|-----------------------------|-------|--------|
| Diabetes mellitus                  | Wound infection             | 0.035 | -      |
|                                    | Pulmonary complications     | -     | 6.769  |
| Malign disease history             | Anastomotic fistula         | -     | 14.250 |
|                                    | Pulmonary complications     | -     | 9.600  |
|                                    | Sepsis                      | -     | 5.380  |
|                                    | Postoperative deaths        | -     | 1.340  |
| Cardio-vascular disease history    | Cardiac complications       | 0.048 | -      |
| History of major abdominal surgery | Sepsis                      | -     | 12.450 |

\*Fisher's Exact Test

\*\* OR=odds ratio, calculated for contingency table with cell frequency less than 5

Test). This is likely due to the small number of patients with heart disease that were analyzed, as well as due to the inclusion in the study of all the cardio-vascular pathologies associated, ones with low mortality (e.g., hypertension, ischemic heart disease-easy form).

Out of the 107 patients who underwent multiorgan resection for locally advanced colorectal cancer, 16 had been admitted as emergency cases. Four of them died perioperative. Due to the small number of patients in this situation, we cannot say whether the incidence of postoperative deaths is influenced by surgery in emergency regime.

In patients who underwent multiorgan resection, most tumors were intestinal-type adenocarcinomas (79.20%), followed by mucinous carcinomas (17.82%) and signet ring cell carcinomas (2.97%). A percentage of 23% of the adenocarcinomas were well differentiated, 51% were moderately differentiated and another 25% were poorly differentiated.

The average tumor size was  $7.91 \pm 5.52$  cm (range 3-25 cm). We found no statistically significant differences between rates of postoperative complications and deaths for the two groups of patients obtained by tumor size (tumors less than 5 cm and tumors larger than 5 cm) ( $p=0.785$  and  $p=0.922$ ; The Pearson Chi-Square). (Table 6)

The histopathological examination showed R0 resection margins (resection margins without tumor invasion) in 92 cases; two cases were found with positive microscopic margins (R1) (2%) and 5 cases with R2 margins (macroscopically positive) (5%). In 2 patients, the histopathological results refuted the diagnosis of cancer, indicating benignity of the lesion. Six patients were not taken into account within these calculations as their histopathological examinations were not found in the database or were inconclusive. As shown by the histopathological findings, radical resection was performed in 85% of the cases.

From the total of patients with multiorgan resections, 25% have had more than two organs resected. The statistical calculation done on the two subgroups gained (that of patients with 2 organs removed and that of patients with more than two organs resected) has shown an increased risk of developing at least one of the postoperative complications studied, in patients with more than 1 organ resected in addition to the primary organ affected by disease ( $p = 0.032$ ; The Pearson

Chi-Square). (Table 6)

The average intervention length in which multiorgan resections were performed was 161 minutes (range 60 -330 minutes). In terms of duration, the interventions were divided into two groups: the group of interventions that lasted under 180 minutes and the group of interventions that lasted 180 minutes and longer. Postoperative complications occurred in 30% ( $n=6$ ) from the group in which the intervention lasted over 180 minutes and in 24% ( $n=21$ ) of those whose interventions lasted under 180 minutes. We observed an increased chance of postoperative deaths after surgery that lasted over 180 min ( $OR=1.529$ ). (Table 6)

Regarding the intraoperative blood loss, the average was 346 ml / intervention with a maximum of 1200 ml. The interventions were divided into: interventions in which at least a quantity of 500 ml of blood was lost and interventions with minimal blood loss (less than 500 ml). Postoperative complications occurred during surgery in 8 patients (57%) with at least 500 ml of blood lost and only in 19 patients (20%) of those with minimal blood loss. Intraoperative blood loss over 500 ml was a risk factor in the occurrence of postoperative complications, respectively of deaths, ( $p = 0.007$  respectively  $p = 0.009$ ; Fisher's Exact Test). (Table 6)

## Discussion and Conclusions

The specialty literature indicates an incidence of multivisceral resection for colorectal cancer between 6.9% - 12.2% (12). The values obtained in our study also fell within this range.

As mentioned in the literature of specialty, the incidence of postoperative complications after multiorgan resection is between 6% and 50% (regarding pelvic exenterations) (12-17). The rate of occurrence of these complications is significantly higher than that of uncomplicated colorectal resections (35.2% vs 17.5%, according to Park) (18). The incidence of postoperative mortality is cited as being 17% - 20%, which represents a significantly higher percentage than that found in cases of resections limited to the colon and rectum. Similar data were obtained in the present study, as the risk of postoperative complications and deaths was found to be higher following multiorgan resections.

According to certain authors, it appears that surgery performed within the first 24 hours of hospitalization on

**Table 6.** The influence of intraoperative factors over postoperative outcome (N=107 patients)

| Intraoperative factors                   | Postoperative complications  | p       | OR*** |
|------------------------------------------|------------------------------|---------|-------|
| Numbers of resected organs (more than 2) | Complications (at least one) | 0.032*  | -     |
|                                          | Deaths                       | 0.288*  | -     |
| Length of surgery over 180 min           | Complications (at least one) | 0.586*  | -     |
|                                          | Deaths                       | -       | 1.529 |
| Intraoperative blood loss over 500 ml    | Complications (at least one) | 0.007** | -     |
|                                          | Deaths                       | 0.009** | -     |
| Tumor size (> 5cm)                       | Complications (at least one) | 0.785*  | -     |
|                                          | Deaths                       | 0.922*  | -     |

\*The Pearson Chi-Square, \*\* Fisher's Exact Test, \*\*\* OR=odds ratio, calculated for contingency table with cell frequency less than 5



patients who presented with neoplastic complications to the emergency ward, leads to a higher rate of postoperative complications and deaths than in the cases of elective resections (12,19,20). Other studies shows a similar incidence of postoperative complications and deaths after emergency surgery in comparison with those in elective surgery (21). Because of the small number of patients with this risk factor, in our study no statistically significant difference was found to indicate a higher postoperative risk after emergency resections.

The age over 64 years is considered to be independent prognostic factor for developing postoperative complications and deaths (12). In our study, the age of over 70 years did not influence directly the morbidity and mortality after multi-organ resections. Though the increased average age was more frequently associated, as expected, with associated diseases and postoperative deaths, underlining the statement that the postoperative risks after multiorgan resections can increase with the age of the patients.

The patient's pathological background also plays an important role in postoperative evolution (22,23). In our study we have showed the negative influence that diabetes, personal history of neoplasia, cardiovascular pathology and personal history of other major abdominal surgeries, have on postoperative evolution, favoring the installation of complications that could put in danger the life of the patients.

Although it is known the higher risk of postoperative anastomotic fistula in patients with low values of total hemoglobin and proteins (24), these factors have not significantly influenced the occurrence of such complication. This is probably because of the mainly scheduled character of these major surgeries, which presume a very thoroughly preoperative preparation, with the correction of the unbalanced variables as much as possible.

Related to the intraoperative risk factors, the literature indicate the increased blood loss as negatively influencing the postoperative evolution (12). In our study, elevated blood losses have increased incidence of postoperative complications and deaths. Also, the rate of appearance of complications has been influenced by the number of resected organs, being higher in patients with more than 2 resected organs (more than 1 organ besides the primary affected). These findings underscore the need for experienced surgical teams to perform this kind of surgeries.

Studies of the literature shows that tumor size did not significantly influence the postoperative outcome (25). Also, in our study we did not find a higher incidence of postoperative complications and death in patients with tumors larger than 5 cm.

The diagnosis of locally advanced colorectal cancer is often difficult to make preoperative. Therefore, the final decision on a multiorgan resection should be taken intraoperative. The difficulty to differentiate between tumor invasion and inflammatory adhesions was and remains a problem for surgeons to face during laparotomy (6). The increased incidence of malignant adhesions (36-70%) together with the increased risk of neoplastic dissemination which may occur in case of their dissolution, clearly indicate tumor resection en bloc with

the invaded neighboring organs. (12)

Higher postoperative risks do clearly not justify exploratory laparotomy or palliative interventions, when tumor resection can be performed with oncological safety margins. We found the multiorgan resections for local advanced colorectal cancer feasible, with acceptable postoperative mortality and morbidity.

Thus, these interventions should be performed in centers of excellence with expertise in multimodal treatment of digestive cancer, in order to achieve optimal results and to offset the higher incidence of postoperative morbidity and mortality. Proper preoperative preparation of the patients, with the compensation of the associated pathology, surgery performed by an experienced team, as well as a corresponding intensive support are required in order to ensure a low risks outcome.

The results of our study highlight the compulsory indication of multivisceral tumor resection as the high percentage of radicality is the proof of the benefits that such interventions can bring. In addition to these findings, we expect that the results of distant survival rates from this ongoing study to be highly unequivocal with respect to the obvious benefits that patients with locally advanced colorectal cancer can have from an aggressive surgical approach.

## Note

The results of this study were partially presented in the form of an oral presentation entitled: "Multi-organ resections for colorectal cancer: analysis factors that may influence postoperative morbidity and mortality." The abstract was published in Abstracts of the National Surgical Conference, Sibiu, May 19-21, 2011.

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