

UNIVERSITY OF MEDICINE AND PHARMACY CRAIOVA
PhD SCHOOL

**POSSIBILITIES AND LIMITS IN THE TREATMENT OF LEFT
COLON CANCER**

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INTRODUCTION

Colorectal cancer is the third most common type of cancer in men (663 000 cases, 10.0% of all cancers) and the second as frequency in women (571 000 cases, representing 9.4% of all malignancies) worldwide. Almost 60% of cases occur in developed regions [1].

Willett attributes this increased incidence in developed countries due to western lifestyle, namely diet and physical inactivity [2]. Also Lemann et al. in a recent study shows the importance of physical inactivity in the development cancer [3].

The incidence of colorectal cancer is highest in countries like Australia, New Zealand, Western Europe. Lowest rate is found in Africa (excluding South Africa), South and Central Asia and parts of Latin America. Men have a higher incidence than women with a ratio of 1.4: 1 [1].

In an population-based study Eide shows that women have a greater susceptibility of developing adenomas until the age of 55, but men as age increases have a higher incidence of both adenomas and colorectal cancer [4].

Approximately 608,000 deaths are recorded worldwide in 2008 due to colorectal cancer representing 8% of all cancer deaths. Colorectal disease is the 4th most common cause of death from cancer.

The mortality rate is lower in women than men, except the Caribbean. Highest mortality due to colorectal cancer for both sexes is recorded in Central and Eastern Europe. The lowest is observed in Central Africa [1].

Aim and objectives

The aim of our study is to analyze and asses the surgical treatment of left colon cancer drawing up a research in which we discuss elective surgery where we use modern techniques of preoperative strategies as enhanced recovery after surgery (ERAS) protocols and on the other hand observe the outcomes of emergency left colon cancer treatment.

The objectives of this study have been represented by:

- Outcomes of elective colon cancer surgery with fast-track protocols
- Outcome of emergency left colon cancer surgery

MATERIAL AND METHODS

The objectives of this study have been achieved by gathering all data from the patients' charts who presented with left colon cancer that have been admitted and underwent surgery at the 1st Surgical Department at Craiova Emergency County Hospital.

Therefore we continued with:

- Analyzing the demographic data of patients with left colon cancer who were admitted and had surgery at the 1st Surgical Department at Craiova Emergency County Hospital in the period 2008-2012.
- Analyzing the evolution of indications and surgical techniques at patients who presented left colon cancer and who were admitted during this 5 year period (2008-2012) at the 1st Surgical Department at Craiova Emergency County Hospital. We studied the above in elective surgery and also in emergency surgery.

Describing the study and the analyzed groups

We achieved an accurate analysis of clinical and patient history, lab workup, imaging studies, surgical treatment and of postoperative evolution at all patients with left colon cancer. We have laid the bases of a retrospective and prospective clinical study which focused on group of patients formed of patients with left colon cancer admitted at the 1st Surgical Department at Craiova Emergency County Hospital in the period 2008-2012.

Selection criteria were represented by diagnosis of left colon cancer. In order to analyze the surgical treatment of left colon cancer the study group was divided in two subgroups:

- the group of patients with left colon cancer who had elective surgery (**Group A**) –
inclusion criteria:
 - patients who presented uncomplicated colon cancer
 - elective surgery
- the group of patients with left colon cancer who had emergency surgery (**Group B**)

These patients have been selected using the following **inclusion criteria:**

- had to present complicated left colon cancer diagnosis (obstruction, perforation, peritonitis, hemorrhage)

- to have undergone emergency surgery

Patients in **group A** underwent the imaging studies in order to establish the diagnosis and illness stage. After receiving the results the best therapeutic approach could be selected.

These being done and after balancing the biologic parameters: Hemoglobin (Hb), proteinemia, ionogram, coagulation status and also associated comorbidities we went ahead with elective surgery.

The used surgical technique was select according to tumor location, local and distant extent of the tumor.

The vascular sealing systems and TA, GIA, EEA staplers have been used in most surgeries.

GIA staplers were of 60, 80, 100 mm with 3,8mm or 4,8mm pins with which the L-L colo-colic anastomosis were made. In some cases when sigmoidectomy was performed which included the recto-sigmoid junction, the colorectal termino-terminal transsuturar anastomosis was performed using EEA mechanical circular stapling devices (28, 31, 34 mm with 4,8 mm pins). In other cases the anastomosis was made on the anterior part of the rectum in a termino-lateral fashion after closing the rectal stump with a 45 or 60 TA stapler using 4,8 pins.

Regarding patients in Group A the following ERAS protocol was used:

- First is imperative to inform the patient about the obligation of active participation in the fast-track program
- Respecting a normal diet on the eve of the operation
- A fluid intake rich in carbohydrates up to 2-3 hours before surgery
- Lack of premedication
- Lack of bowel preparation
- The use of rapid-acting volatile anesthetic (Sevoflurane) and epidural anesthesia preferably using bupivacaine on epidural catheter
- Restricting intake of intraoperative infusion solutions to 1500-2000ml
- Ensure intraoperative normothermia by covering the extremities, the use of warming infusion solutions, and maintaining the temperature in the operating room at 22-24⁰C
- For minimizing postoperative pain recommendations are to use local anesthetics after wound closer when surgery is completed, epidural catheter maintenance for 24 h, further

use of painkillers and NSAID's (Non-steroidal anti-inflammatory drugs) even in I.V (Intravenous) administration.

- Reducing intra-operative mobilization maneuvers of visceral organs
- Administration of oxygen therapy in the first 12-24 h postoperatively
- Suppression of nasogastric catheter at the time or after tracheal detubation
- Early Suppression of urinary catheter in the first 24 hours or within 48 hours for those who maintain epidural catheter
- Start early postoperative nutrition represented by up to 200 ml of liquids rich in carbohydrates 6-8h after surgery, after administering a liquid and semi-liquid diet (yogurt, soup, tea, water) then reinstating a normal diet on the second day post-op.
- Start starting an early mobilization immediately after surgery with a gradual increase of effort and duration

Regarding patients in group B, emergency surgery was performed after hemodynamic resuscitation without any mechanical bowel preparation.

All the patients were intubated and received general anesthesia

The used surgical technique was chosen depending on tumor location, state of intestine wall, associated complications due to tumor perforation, peritonitis, obstruction and also depending on the associated co-morbidities like age and biologic status of the patient.

Thus, the following type of surgeries were performed:

- Colon resections
- External and internal bowel diversion, representing the first step in a staged procedure.

We have to mention the fact that we did not use mechanical sutures with patients who underwent emergency procedures.

After surgery the patients received medication in order to balance hydroelectrolite depletion, anemia and also received pain medication, gastric antiseccretory drugs, antibiotics. All patients received low weight heparin in order to prevent deep vein thrombosis and pulmonary trombembolism

Study protocol

In developing the study protocol, we analyzed all charts from patients with left colon cancer who were admitted and operated at the 1st Surgical Department at Craiova Emergency County Hospital in the period 2008-2012. We analyzed the characteristics of every case regarding patient history, clinical data, treatment and evolution as follows:

- ASA (American Society of Anesthesiology) score [5]

ASA score

ASA 1	Patient is a completely healthy fit patient
ASA 2	Patient has mild systemic disease
ASA 3	Patient has severe systemic disease that is not incapacitating
ASA 4	Patient has incapacitating disease that is a constant threat to life
ASA 5	A moribund patient who is not expected to live 24 hour with or without surgery

- Demographical data including social class, age and sex
- Incidence of left colon cancer
- Tumor location
- Associate co-morbidities
- Surgical history
- Clinical examination and biological work-up
- Imaging studies, local and distant disease
- Dividing left colon cancer cases in complicated and uncomplicated forms
- Recording the type of surgery used: elective or emergency, palliative or radical excision, external or internal diversions
- Postoperative evolution, morbidity and mortality

Statistical Analysis

Microsoft Office Access was used in forming the databases. For the statistical analysis, the databases were processed in Microsoft Excel. The following statistical descriptive uni-dimensional indicators were used: arithmetic mean, standard deviation and variation coefficient.

For comparing averages of quantitative variables we used the Student test, and for comparison of qualitative variables the Chi2 (X2) test was used.

In reading the statistical tests results the following was taken into account:

- $p < 0.05$ - statistically significant difference
- $p < 0.01$ - highly significant statistical difference
- $p > 0.05$ - statistical insignificant difference

CONCLUSIONS

- In our study the incidence of colon cancer is highest in the 8th decade of life accounting for 33.5 % of all cases of left colon cancer.
- 60% of patients who had positive history of cancer were female. Although men show a higher incidence of left colon cancer, women have a higher incidence of associated malignancies.
- Left hemicolectomies were the most encountered form procedures totaling 80.3 % of all procedures.
- The most common type of macroscopic form was the obstructing-infiltrative type observed in 66.4% of patients. Pathologically speaking, adenocarcinoma was present in the majority of patients, 66.7 % .
- Regarding tumor grading, G2 and G3 were the most frequent observed in our patients
- Dominant signs and symptoms were represented by bowel disorders in the majority of cases counting for 91.5 %.
- CEA and CA- 19.9 had values above the normal range in 71 patients (66.3 %).
- Although markers are not very accurate in the diagnosis of colon cancer or predicting postoperative recurrences in our study we found them very useful for guiding the diagnosis and in detecting postoperative recurrence.
- We think that barium enema can still be successfully used in clarifying diagnosis and in some cases establishing them.
- Abdominal ultrasound was the most common used imaging tool being performed in 97.1 % of cases for abdominal evaluation. In our experience this has been a useful tool in detecting liver metastases.

- Wound infection was the most common complication among patients undergoing elective surgery being present in 19.6% of cases.
- The literature varies widely regarding results from classic, laparoscopic and fast-track colon surgery. Making a review of the literature we found that fewest complications were noted in patients benefiting from the fast-track protocol who underwent laparoscopic surgery. Perhaps in the future this will be the best solution for patient with left colon cancer due to lower costs determined by short hospital stay.
- In our study patients who benefited from the ERAS protocol and underwent surgery represented a feasible future managing strategy due to lower costs and shorter hospital stay.
- For us the ERAS program represented a challenge with a rapid learning curve, a very important role being played by patient compliance.
- Regaining early bowel function after surgery was noted in patients with ERAS protocol.
- Observing literature we notice that patients with colon cancer operated in a classic manner had almost double the hospital stay compared with patients with the ERAS protocol.
- The most common cause of emergency presentation in patients with left colon cancer was represented by tumor obstruction.
- The most common cause of septic complication was bowel perforation with generalized fecal peritonitis
- In our opinion primary resection with anastomosis is a more difficult and challenging procedure for the surgeon, but with superior benefits to the patient who no longer needs a second surgical stage.
- In our study, some patients who receiving the Hartman procedure did not return for the second stage which represented reinstating normal bowel function . This is probably due to fear of hospital and a 2nd major surgery, lack of medical education, poor socio-economic status, etc.
- If future studies confirm the low rate of complications in patients with primary resection and anastomosis this could be the treatment of choice. However in fragile patients with multiple associated co-morbidities our experience states that the Hartman is the best option
- Given our findings compared with results observed in literature, we strongly recommend that patients with advanced left colon cancer who present local advanced disease must undergo multi-visceral resection whenever possible.

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