

EVALUATION OF LAPAROSCOPIC MANAGEMENT OF COLORECTAL CANCER

Essay

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By

Hassan Gad El-Mawla Ahmed Mohamed

M.B., B.Ch,

Faculty of Medicine - Ain Shams University

Supervisors

Prof. Dr. Mohamed Naguib Hassan Atia

Professor of General Surgery

Faculty of medicine - Ain Shams University

Ass. Prof. Dr. Wael Abdel-Azeem Jumuah

Ass. Professor of General Surgery

Faculty of medicine - Ain Shams University

Dr. Mahmoud Zkaria Abdel-Aziz

Lecturer of General Surgery

Faculty of Medicine - Ain Shams University

**Faculty of medicine
Ain Shams University
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وَأَنْزَلَ اللَّهُ عَلَيْكَ
الْكِتَابَ وَالْحِكْمَةَ
وَعَلَّمَكَ مَا لَمْ تَكُنْ
تَعْلَمُ وَكَانَ فَضْلُ
اللَّهِ عَلَيْكَ عَظِيمًا

صِرَقَ اللَّهِ الْعَظِيمِ

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List of Abbreviations

AJCC	American Joint Committee on Cancer
CAP	The College of American Pathologists
CCD	charge-coupled device
CEA	Carcinoembryonic Antigen
CI	Confidence interval
COLOR	Colon cancer Laparoscopic or Open Resection
COST	Clinical Outcomes of Surgical Therapy
DCBE	Double contrast barium enema
DCC	deleted in colon cancer
DRE	Digital rectal exam
FAP	Familial adenomatous polyposis
FOBT	Fecal occult blood test
HALS	Hand-assisted laparoscopic surgery
HNPCC	Hereditary nonpolyposis colorectal cancer
HRT	hormone replacement therapy
IAP	intra-abdominal pressure
LCD	liquid crystal display
MSI	Microsatellite instability
PCR	polymerase chain reaction
PET	Positron emission tomography
PP	Pneumoperitoneum
RGB	Red, green, and blue
TEM	Transanal endoscopic microsurgery Clinical Outcomes of Surgical Therapy (COST) and Conventional)
TME	Total mesorectal excision
UICC	The International Union Against Cancer
VEGF	Vascular endothelial growth factor

INTRODUCTION

Colorectal cancer is the third most common malignant disease and the second most frequent cause of cancer related death in the western countries, with an estimated 101, 340 new cases (colon cancer only), and 49, 380 deaths (colon and rectal cancers combined) in the United States in 2011 (*American CANCER Society, 2011*).

Colon cancer is becoming common in Egypt. It also has unique characteristics that differ from those reported in the western countries (*Yamato et al., 200 ٧*).

Laparoscopic surgery has revolutionized a number of operations including cholecystectomy and Nissen fundoplication. The first laparoscopic colonic resection was performed by Jacobs in Miami, Florida, in June of 1990. However, the uptake of laparoscopic approaches to colorectal surgery has been slow (*Jacobs et al., 1991*).

Early concerns were raised with regard to all aspects of cancer surgery, including morbidity, mortality, quality of life, local recurrence and a problem specific to laparoscopic surgery, port site recurrence, which have tempered the initial enthusiasm for this technique (*Leung et al., 2004*).

However, the results of a large randomized controlled

trial of laparoscopic surgery for colorectal cancer and other studies have suggested that many of these concerns are unfounded. Other issues to be considered when introducing routine laparoscopic colorectal surgery are the impact on operating times, training and cost implications to the hospital (*Enker et al., 2002*).

The applicability of laparoscopy to colorectal diseases continues to expand. Laparoscopic approach should be mainly considered for patients with benign conditions. For colorectal cancer, results from randomized trials so far have been favorable (*Aziz, 2006*).

In advanced colorectal carcinoma using laparoscopic approach is controversial because of the technical difficulties in dissection. On the other hand, it might facilitate effective palliation in selected patients with the avoidance of a major laparotomy (*Yamato et al, 200 ٧*).

There are three basic roles of laparoscopic surgery for patients with colorectal cancer. First, although infrequently needed prior to therapy, diagnostic or staging laparoscopy may be valuable in certain colorectal cancer patients. Second, the laparoscopic approach may offer several attractive features for the palliative management of patients with incurable colorectal cancer. Finally, although this issue is the most controversial,

there are theoretic but unproved advantages of using laparoscopic techniques for curative colorectal cancer therapy (*Milsom et al., 2004*).

In open surgery bleeding is usually controlled by pressure, suturing, ligation, packing or a combination of these methods. In laparoscopic surgery the same techniques can be used, but they are much more difficult to perform and not always successful, which often lead to conversion to open surgery. Injury to the major blood vessels is a rare complication in open surgery, also not common in laparoscopic colonic surgery (*Hartley and Mansson, 2002*).

Large, multi – center studies, generally including data from specialized centres, suggest that laparoscopic colorectal surgery is safe and offers potential short- term benefits to patients without adversely affecting the long-term outcomes following resection for colorectal cancer (*Jemal et al., 2009*).

AIM OF THE ESSAY

The aim of this essay is to evaluate the role of laparoscopy in the surgery of colorectal carcinoma, to review the recent advances in laparoscopic colectomy, and to evaluate the new equipments, techniques, advantages, disadvantage of laparoscopic colectomy versus conventional open surgical technique.

SURGICAL ANATOMY OF THE COLON

Special points in surgical anatomy of the Colon:

The large intestine extends from the terminal ileum to the anus. To be more embryologically and anatomically correct, it extends to the pectinate (dentate) line, in other words, to the proximal 2 cm of the anal canal (*Jamieson et al., 2006*).

The classic divisions of the colon are the cecum, the colon proper, the rectum, and the anal canal. The first 6 cm of the large intestine just below the ileocecal valve, the ascending colon, and the hepatic flexure form a surgical unit, the right colon (right colectomy). The distal transverse colon, splenic flexure, and descending and sigmoid colons constitute the left colon (left colectomy) (*Skandalakis et al., 2009*).

Length and Diameter of the Large Intestine:

Textbooks of anatomy offer no agreement about the length of the segments of the large intestine. Estimates of the length of the large bowel average about 1.3-1.8 m. According to Gray's Anatomy (37th ed.), the length from the end of the distal ileum to the anus is about 1.5 m. *Goligher* estimated the length of the colon to be 4 $\frac{1}{2}$ ft (1.25 m) (*Skandalakis et al., 2009*).

Saunders et al. reported intra operative measurements of colonic anatomy in 118 patients, reporting a mean total colonic length of 114. 1 cm (range 68-159 cm). A free sigmoid loop was not present in 20 patients (17%) because of adhesions. Ten patients (8%) had a descending mesocolon of 10 cm or more, and 11 patients (9%) had an ascending mesocolon of 10 cm or more. Twenty-four patients (20%) had mobile splenic flexures. The mid-transverse colon reached the symphysis pubis in 34 patients (29%) (*Saunders et al., 1995*).

The caliber of the large bowel is greater close to the cecum, it gradually gets smaller toward the rectum, then dilates again at the rectal ampulla just above the surgical anal canal. A sigmoid colon loop is occasionally as wide as a loop of terminal ileum(*Skandalakis et al., 2009*).