

A COMPARISON BETWEEN OPEN SURGERY AND LAPAROSCOPIC TECHNIQUES FOR MALIGNANT RECTAL TUMORS

An Essay

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Contents

Title	Page No.
List of Abbreviations	ii
List of Tables	iv
List of Figures	v
Introduction and Aim of the Essay	1
• Anatomy of the rectum	5
• Physiology of the rectum	23
• Pathology of rectal cancer	28
• Diagnosis of rectal cancer	52
- Clinical features	52
- Investigations	55
• Treatment.....	67
- Surgical	67
- Non Surgical	75
• Surgical Techniques	83
Discussion	139
Summary and Conclusion	147
References	149
Arabic summary	--

List of Abbreviations

APC	Adenomatous Polyposis Coli
BCG	Bacillus Calmette-Guérin
CEA	Carcinoembryonic Antigen
CLS	Conventional Laparoscopic Surgery
CRC	Colorectal Cancer
CT	Computer-Assisted Tomography
DSBE	Double contrast barium enema
EGFR	Epidermal Growth Factor Receptor
FAP	Familial Adenomatous Polyposis
FEV1	Forced Expiratory Volume In 1
FOBT	Fecal Occult Blood Test
FS	Flexible Sigmoidoscopy
FVC	Forced Vital Capacity
HER	Growth Factor Receptor
HNPCC	Hereditary Non polyposis Colorectal Cancer
IORT	Intraoperative Radiation Therapy
LR	Iocal Recurrence
MMR	Mismatch Repair
MRI	Magnetic Resonance Imaging
PCR	Pathological Complete Response
PET	Positron Emission Tomography

List of Abbreviations (Cont...)

SILS:	Single-incision laparoscopic
SPA:	Single-port Access
TME:	Transanal Endoscopic Microsurgery
VEGF:	Vascular Endothelial Growth Factor

List of Tables

Table No.	Title	Page No.
Table (1):	Primary Tumor(T).....	45
Table (2):	Regional Lymph Nodes (N).....	46
Table (3):	Distant Metastasis (M):.....	46
Table (4):	Anatomic Stage/Prognostic Groups:a	47

List of Figures

Fig. No.	Title	Page No.
Fig. (1):	The formation of the hindgut.....	5
Fig. (2):	The formation of the rectum and anus.....	6
Fig. (3):	Rectum and Anal Canal - Topography, Course, and Relations	8
Fig. (4):	Fascial relations of rectum	17
ig. (5):	Arterial supply of anorectum region	19
Fig. (6):	Venous drainage of the anorectum region.....	20
Fig. (7):	Lymphatic drainage of the anorectum region	21
Fig. (8):	Nerve supply of the rectum and anal canal	22
Fig. (9):	Carcinoid tumour of the rectum	36
Fig. (10):	A view of polypoid fungating carcinoma of the rectum in a 56-year-old male	37
Fig. (11):	Gross appearance of a colectomy specimen (containing the crater-like, irregularly-shaped tumor).	38
Fig. (12):	Moderately diiferentiated adenocarcinoma of colon.....	39
Fig. (13):	Mucinous adenocarcinoma	40
Fig. (14):	Signet ring adenocarinoma.....	41
Fig. (15):	Schematic description of the staging system with respect to the depth of invasion	48
Fig. (16):	Rigid sigmoidoscopy	56
Fig. (17):	Colon cancer: by sigmoidoscopy	56
Fig. (18):	Double contrast barium enema of a carcinoma of rectum.....	58
Fig. (19):	Cancer seen at colonoscopy	60

List of Figures

Fig. No.	Title	Page No.
Fig. (20) :	Transverse CT scan showing perirectal tumor extension (arrows) and local lymph node (cuvied arrow).	61
Fig. (21):	Stage IIIB (T3, N1) rectal carcinoma with tumor invasion into mesorectal fat.....	62
Fig. (22):	Endorectal ultrasound.....	63
Fig. (23):	Endorectal ultrasonography showing a T3 rectal carcinoma.....	64
Fig. (24):	False-negative interpretation of PET images.	66
Fig. (25) :	Diagram Illustrating Mesorectal excision during removal of rectal tumor	73
Fig. (26) :	Circular staplers.....	92
Fig. (27) :	Construction of anastomosis using the circular stapler.	95
Fig. (28):	Double-stapling techniques.....	96
Fig. (29):	Single-layer hand-sutured anastomosis.	97
Fig. (30):	Portion of abdominoperineal resection for synchronous operation.	102
Fig.(31) :	Perineal portion when patient is repositioned.	105
Fig. (32):	Configuration of the Anal Dynamic Graciloplasty, Showing the Transposed Gracilis Muscle.....	111

INTRODUCTION

Colon and rectal cancer incidence was negligible before 1900. The incidence of colorectal cancer has been rising dramatically following economic development and industrialization. Currently, colorectal cancer is the third leading cause of cancer deaths in both males and females in the United States (*American Cancer Society, 2011*).

Adenocarcinomas comprise the vast majority (98%) of colon and rectal cancers. Other rare rectal cancers, including carcinoid (0.4%), lymphoma (1.3%), and sarcoma (0.3%). Squamous cell carcinomas may develop in the transition area from the rectum to the anal verge and are considered anal carcinomas. Very rare cases of squamous cell carcinoma of the rectum have been reported (*Anagnostopoulos et al., 2005*).

Approximately 20% of colon cancers develop in the cecum, another 20% in the rectum, and an additional 10% in the rectosigmoid junction. Approximately 25% of colon cancers develop in the sigmoid colon (*Giovannucci & Wu, 2006*).

The etiology of colorectal cancer can be seen as an interaction between genetic factors but the basic underlying cause appears to be an accumulation of genetic mutation, which leads to the development of benign adenomas with subsequent

transformation to invasive malignancy (the adenocarcinoma sequence) (*Cuschieri & Robert, 2001*).

Seventy percent of patients with colorectal cancer with apparently localized disease, in these patients surgery can be curative, but relapse after complete resection is frequent. Many trials including adjuvant therapy have rapidly developed to decrease the recurrence rate and increasing the survival of the patient (*Enker et al., 2000*).

Open colorectal procedures have always been considered the cornerstone operations for colorectal malignancy. But since the first laparoscopic cholecystectomy performed in 1985, advances in minimally invasive techniques and equipment have permitted safe and more advanced operations to be performed starting from laparoscopic appendectomy and up to laparoscopic liver, pancreatic and colorectal resection. First laparoscopic colectomy was performed on 1991 (*Jacobs et al., 1991*).

Apart from perforation and obstructing carcinoma, there are no uniformly accepted specific contraindications (*John, 2002*).

Transanal excision was the most commonly performed procedure for local excision of rectal masses. Transanal endoscopic microsurgery (TEM) has long been utilized in Europe but has been adopted much more slowly in the United States (*Cataldo, 2006*).

Recent resurgence in local excision of rectal masses has stimulated renewed interest in the procedure. TEM has been advocated by some as a superior technique to transanal excision, offering lower recurrence rates without increases in morbidity (*Middleton et al., 2005*).

On the other hand, the treatment of early rectal cancer by means of endoscopic resection might well be a safe and effective alternative. Endoscopic resection can be used as curative treatment in selected patients with early rectal cancer. It has been accepted not only in Japan but also in Western countries. However, prospective studies are still needed to compare the results of endoscopic resection techniques with laparoscopic surgery for patients with early rectal cancer (*Hurlstone et al., 2004*).

Endoscopic resection was safe and effective for the treatment of early rectal cancers; the results were comparable to patients undergoing a transanal excision. In addition, the endoscopic resection had the advantage of a shorter hospital recovery (*Lee et al., 2009*).

AIM OF THE ESSAY

The aim of this essay is to throw some lights on the comparison between open surgical excision of malignant rectal tumors and laparoscopic resection, and to investigate the safety and efficacy of transanal excision compared to laparoscopic resection.

ANATOMY OF THE RECTUM

Embryology:

Formation of the hindgut during the first month of life, the embryo undergoes an anterior flexion, called cephalocaudal plication. The ectoblaste stays on the convex pole of the embryo. The entoblaste engages the concave part and forms the anterior, median and posterior gut inside and the umbilical vesicle and allantoïd outside the embryo (*Faucheron, 2005*).

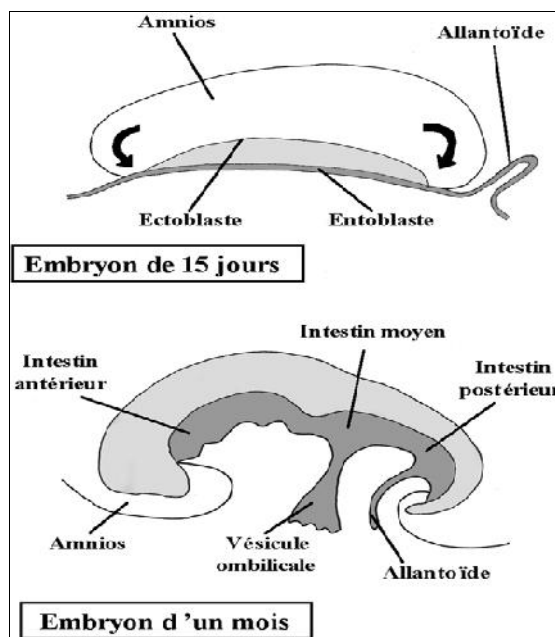


Fig. (1): The formation of the hindgut (*Faucheron, 2005*).

The posterior gut, or hindgut, develops and becomes the splenic flexure, the descending colon, the sigmoid colon, the

rectum and the anal canal. The distal part of this hindgut ends in a cul de sac called cloaca. At that point, the entoblaste is in contact with the ectoblaste, defining a membrane called the cloacal membrane. Formation of the rectum and anus. A transversal membrane progressively descends between the allantoïd in the front and the hindgut behind, so that the cloaca is separated into two parts: the anterior one receives the name of urogenital sinus and the posterior the name of anorectal canal. Before the end of the second month of life, the septum joins the cloacal membrane and will form later, in the girl, the perineal fibrotic area. That membrane is divided into urogenital membrane in the front and anal membrane behind (*Faucheron, 2005*).

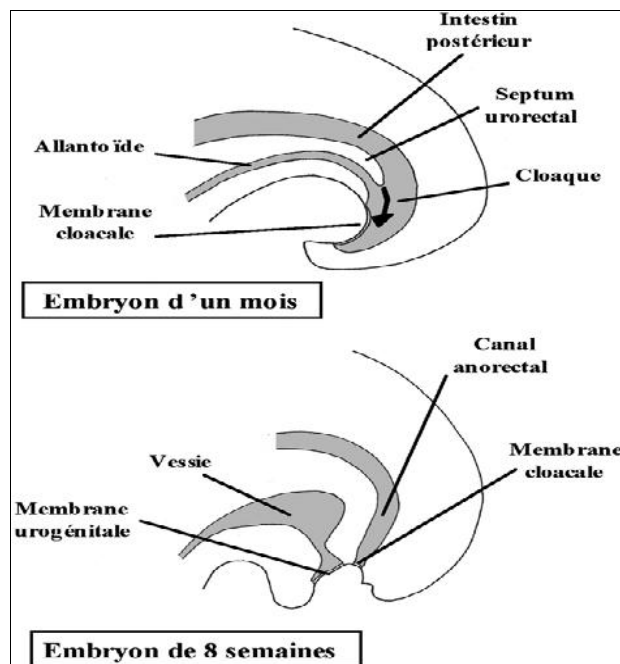


Fig. (2): The formation of the rectum and anus (*Faucheron, 2005*).