RECENT MODALITIES IN THE MANAGEMENT OF COLORECTAL CARCINOMA

Essay

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in General Surgery

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بسم الله الرحمن الرحيم

قالوا

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صدق الله العظيم

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List of Abbreviations

5-FU	**:**	5-fluorouracil
AJCC	**:**	American Joint Committee for Cancer
ANP	**:**	Autonomic nerve preservation
APC	**:**	Adenomatous polyposis coli
APR	**:**	Abdominoperineal resection
APUD	**:**	Amine precursor uptake and decarboxylation
ASCRS	**:**	American society of colon & rectal surgery
ASOs	**:**	Antisense oligonucleotides
ASCO	**:**	American Society of Clinical Oncology
BUN	**:**	Blood urea nitrogen
CA 19-9	**:**	Carbohydrate antigenic determinant 19-9
CAA	**:**	Coloanal anastomosis
CAP	**:**	College of American Pathologists
CD	**:**	Crohn's disease
CE	**:**	Capsule endoscopy
CEA	**:**	Carcinoembryonic antigen
CHRPE	**:**	Congenital hypertrophy of retinal pigment epithelium

Cis	**:**	Carcinoma in situ
CLS	**:**	Conventional laparoscopic surgery
CLM	**:**	colorectal liver metastasis
COX-2	**:**	cyclooxygenase-2
CRC	**:**	Colorectal cancer
CRM	**:**	circumferential resection margins
CRT	**:**	chemoradiotherapy
CT	**:**	Computed tomography
DFS	**:**	Disease free survival
EMR	**:**	Endoscopic Mucosal Resection
ERUS	**:**	Endorectal ultrasound
ESMO	**:**	European Society of Medical Oncology
FAP	**:**	Familial adenomatous polyposis
FDG	**:**	Fluorine-18-labeled deoxyglucose
FOBT	**:**	Fecal occult blood testing
FUDR	**:**	Floxuridine
GI	**:**	Gastrointestinal
HAI	**:**	hepatic arterial infusion
HNPCC	**:**	Hereditary non-polyposis colorectal cancer
IBD	**:**	Inflammatory bowel disease
IDS	**:**	International documentation system

IORT	**:**	Intraoperative radiation therapy
IU	**:**	Intrarectal Ultrasound
IVP	**:**	Intravenous pyelogram
JSMO	**:**	Japanese Society of Medical Oncology
LAR	**:**	Low anterior resection
LR	**:**	local recurrence
MBP	**:**	Mechanical bowel preparation
MHC	**:**	Major histocompatibility complex
MMR	**:**	Mismatch repair
MoAB	**:**	Monoclonal antibodies
MRI	**:**	Magnetic resonance imaging
MSI	**:**	Microsatellite instability
NICE	**:**	National Institute for Health and Clinical Excellence
NSAID	**:**	Nonsteroidal anti-inflammatory drugs
NCCN	**:**	National Comprehensive Cancer Network
OC	**:**	optical colonoscopy
PET	**:**	Positron emission tomography
RAID	**:**	Radioimmuno detection
RFA	**:**	Radio-frequency ablation
RT	**:**	Radiotherapy

RTOG	**:**	Radiation Therapy Oncology Group
SCPRT	**:**	Short course preoperative radiotherapy
SILS	**:**	Single-incision laparoscopic surgery
SPA	**:**	Single-port access
SSAs	**:**	sessile serrated adenomas
SSI	**:**	Surgical site infection
TSAs	**:**	traditional serrated adenomas
TAA	**:**	Tumor associated antigens
TAR	**:**	Laparoscopic transanal resection
TCR	**:**	T-cell receptor
TEM	**:**	Transanal Endoscopic Microsurgery
TME	**:**	Total mesorectal excision
UC	**:**	Ulcerative colitis
UICC	**:**	Union for International Cancer Control

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Introduction

Colorectal cancer is a major cause of morbidity and mortality throughout the world. It accounts for over 9% of all cancer incidences. It is the third most common cancer worldwide and the fourth most common cause of death ***(Haggar & Boushy, 2009).***

There has been an explosion of information on genetic basis of colorectal cancer. It is now accepted that virtually all colorectal carcinomas arise within pre-existing adenomas in a stepwise progression due to accumulation of genetic abnormalities. However, it must be noted that it is not a simple stepwise progression but a complicated array of multiple gene changes ***(Mortonsen & Ashraf, 2008).***

Right colon lesions may become large before symptoms develop. Patients may complain of vague right abdominal pain or occult bleeding which may lead to anemia. On the other hand, left colon lesions can cause partial or complete intestinal obstruction, bleeding or change in bowel habits ***(Chang et al., 2006).***

Digital rectal examination is essential and many rectal tumours can be identified as a craggy ulcerated mass during this procedure. More proximal tumours are identified at sigmoidoscopy or colonoscopy. The rigid sigmoidoscope offers only a limited examination up to 30 cm from anal verge but the

flexible sigmoidoscope enables the distal 60 cm of bowel to be examined, which should identify 70% of tumours. Access to the remainder requires full colonoscopy or double-contrast barium enema. Biopsy of any lesion visualized is essential ***(Cushiere & Grace, 2003).***

The commonly used imaging modalities include plain radiograph of the abdomen(supine , upright & diaphragmatic views), Double contrast barium enema, Computed Tomography (CT), Virtual Colonoscopy (CTcolography), Magnetic Resonance Imaging (MRI), Positron Emission Tomography(PET), Angiography, Endorectal & Endoanal Ultrasound ***(Bullard & Rothenberger, 2006).***

At Laparotomy or laparoscopic resection, surgical options include right hemicolectomy, right radical hemicolectomy, transverse colectomy, Left hemicolectomy, Low anterior resection, abdominoperineal resection or subtotal colectomy ***(Midis & Feig, 2012).***

5-Fluorouracil remains the backbone of chemotherapy regimens for colon cancer, both in the adjuvant and metastatic setting. In the past 10 years, it was established that combination regimens provide improved efficacy and prolonged progression-free survival in patients with metastatic colon cancer. In addition to 5-fluorouracil, oral fluoropyrimidines such as capecitabine (Xeloda) and tegafur are increasingly used

as monotherapy or in combination with oxaliplatin (Eloxatin) and irinotecan (Camptosar) ***(Dragovich, 2013).***

Laparoscopy is currently utilized in nearly 45% of elective colectomies for benign & malignant diseases. Overall, laparoscopic colectomy results in shorter periods of hospital stay, fewer complications & lower mortality as compared to open colectomy. Also laparoscopic colectomy significantly retires hospital costs. The majority of these advantages are maintained regardless of patient severity of disease classification ***(Pedraza et al., 2013).***

Aim of the Essay

To discuss and review the recent modalities in diagnosis and treatment of colorectal cancer.

Anatomy of Colon & Rectum

EMBRYOLOGY

The primitive gut is derived from endoderm and begins to form during the 3rd to 4th weeks of gestation. It is divided into three segments: foregut, midgut, and hindgut. The midgut gives rise to the small intestine distal to the ampulla of Vater, the cecum and appendix, the ascending colon, and the right half to two thirds of the transverse colon, all of which receive blood supply from the superior mesenteric artery ***(Wick, 2011).***

During the 6th gestational week, the midgut herniates from the abdominal cavity into the extra-embryonic coelom, undergoes a 270 degree counter clockwise rotation around the superior mesenteric artery, and then returns to the abdominal cavity at 10 weeks gestation. The hindgut gives rise to the distal one third of the transverse colon, descending and sigmoid colon, rectum, and upper portion of the anal canal, all of which receive blood from the inferior mesenteric artery ***(Wick, 2011).***

The terminal end of the hindgut is the endoderm-lined pouch termed the cloaca. During development, the cloaca is partitioned by the urorectal septum into the rectum and upper anal canal and urogenital sinus. Ultimately, the distal anal canal arises from canalization of the ectoderm. The pectineal or dentate line marks the junction between tissues derived from endoderm and ectoderm in the anal canal ***(Wick, 2011).***