Management Of Locally Advanced Rectal Cancer

Essay

Submitted for Partial Fulfillment of Master Degree in General Surgery

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قُلْ إِنَّ صَلَاتِي
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*First of all; Thanks to **Allah** the most merciful for guiding and giving me the power to complete this work the way it is.*

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Ali Rashad Abd El-Moniem El-Shaer

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APR	:	Abdominoperineal resection
APRP	:	Acute Phase Reactants Proteins
APC	:	Adenomatous Polyposis coli gene
ASCO	:	American Association of Clinical Oncology
ARS	:	Anterior resection syndrome
ANP	:	Autonomic Nerve Preservation
CA19.9	:	Cancer antigen 19.9
CEA	:	Carcinoembryonic antigen
CRT	:	chemo-radiation treatment
CIP	:	Chromosomal instability pathway
CRM	:	circumferential radial margin
CAA	:	Coloanal anastomosis
CSA-P	:	Colon Specific Antigen-P
CCR	:	complete clinical response
CTC	:	Contrast enhanced colonography
CLASICC trial	:	conventional versus laparoscopic- assisted surgery in colorectal cancer trial
DVT	:	Deep vein thrombosis
DFS	:	disease free survival
DCE-MRI	:	Dynamic Contrast Enhanced-MRI
ECC	:	electronic colon cleansing
EUS	:	endo rectal ultrasound
EMA	:	epithelial membrane antigen
EAS	:	external anal sphincter
EBRT	:	External beam radiotherapy
FOV	:	Field of view
FDG-PET	:	Fluro deoxy Glucose Positron Emission Tomography
FTLE	:	Full-thickness local excision
IMA	:	inferior mesenteric artery
IAS	:	Internal anal sphincter
IORT	:	Intra operative Radiation Therapy
LARC	:	locally advanced rectal cancer
LAR	:	low anterior resection

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LMWH	:	Low molecular weight heparin
MRC	:	Magnetic Resonance colonography
MSI	:	Microsatellite Instability Pathway
MMR	:	mismatch repair genes
MDCT	:	multi-detector CT scan
MLH1	:	MutL Protein Homolog1 gene
MSH2,3,6	:	MutS protein homolog 2,3,6 gene
NCCN	:	National Comprehensive Cancer Network
NeoCRT	:	Neo chemo Radiation Therapy
Nd: YAG	:	neodymium yttrium argon garnet laser
OS	:	overall survival
pISR	:	Partial Intersphencteric resection
Pcr	:	pathologic complete response
PET	:	Positron emission Tomography
SEMS	:	Self-expanding metal stents
SMA	:	superior mesenteric artery
SPIO	:	superparamagnetic iron oxide particles
DCC gene	:	The deleted in colorectal cancer gene
tISR	:	Total Intersphencteric resection
TME	:	total mesorectal excision
TEMS	:	trans anal endoscopic microsurgery
TRG	:	tumor regression grade
TSME	:	tumor-specific mesorectal excision
UFH	:	Un fractioned heparin

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Abstract

The best chance of cure in those patients appears to involve preoperative chemo-radiation treatment (CRT), maximal surgical resection, and intraoperative radiotherapy in selected cases, preoperative and postoperative chemo-radiotherapy resulted in similar 10-year overall survival (OS) and disease-free survival (DFS) but preoperative CRT resulted in lower local recurrence rate, lower incidence of toxicity and lower incidence of long term morbidity, The aim of this work is to highlight the recent methods of diagnosis and treatment modalities of locally advanced rectal cancer.

A locally advanced rectal cancer (LARC) often describes a tumor extending beyond the rectal wall with infiltration to surrounding organs or structures, and/or perforation of the visceral peritoneum. It includes presence of lymph nodes and bulky T3 tumors with threatened circumferential margins or T4 tumors, tumors with growth onto the peritoneal surface. MRI is currently the most accurate modality on which to base treatment decisions for patients with rectal cancer. While during operations diagnosis depending on taking biopsies either open or preoperatively by endoscope. The proper treatment of patients with locally advanced rectal cancer is the multimodality therapy (chemotherapy, radiotherapy, surgery) which is the treatment of choice. The rationale for adding adjuvant chemotherapy following neo CRT and surgery is to eliminate micrometastatic disease. several investigators have thought about giving the entire intended chemotherapy preoperatively with the standard neo CRT. While the development of multi- modal therapy for rectal cancer has led to better outcomes and survival**, several complications** and **functional issues**

Keywords: CRT: chemo-radiation treatment, DFS: disease free survival, LARC: locally advanced rectal cancer, NeoCRT: Neo adjuvant chemo Radiation Therapy, OS: overall survival

Introduction

Colorectal cancer is currently the third most common cancer diagnosed in both men and women, and the third leading cause of cancer- related deaths in the United States. The American cancer society estimates the number of colorectal cancer cases in the United States for 2014 are 40,000 new cases of rectal cancer. The lifetime risk of developing colorectal cancer is about 1 in 20 (5%). This risk is slightly lower in women than in men (**Siegel et al.,2014**).

A locally advanced rectal cancer often describes a tumor extending beyond the rectal wall with infiltration to surrounding organs or structures, and/or perforation of the visceral peritoneum. It includes presence of lymph nodes and bulky T3tumors with threatened circumferential margins or T4 tumors, tumors with growth onto the peritoneal surface. A radiological T3 tumor refers to a tumor invading through muscularis propria, while aT4 tumor refers to a tumor growing outside the mesorectal fascia. Patients with locally advanced rectal cancer are those with clinical stage II (T3-T4, N0, MO) and stage III (any T, N1-2, M0). They are often associated with a poorer overall prognosis than earlier stage disease (**Guillem et al.,2005**).

Surgery with curative intent is the mainstay of treatment for locally advanced rectal cancer. However, surgery alone results in

a high rate of local and distant failure. The best chance of cure in those patients appears to involve preoperative chemo-radiation treatment (CRT), maximal surgical resection, and intraoperative radiotherapy in selected cases (**De caluwe et al.,2013**).

Preoperative and postoperative chemo-radiotherapy resulted in similar 10-year overall survival (OS) and disease-free survival (DFS) but preoperative CRT resulted in lower local recurrence rate, lower incidence of toxicity and lower incidence of long term morbidity(**Glynne-Jones et al.,2013**).

Aim of the work

The aim of this work is to highlight the recent methods of diagnosis and treatment modalities of locally advanced rectal cancer.

Chapter (1):
Anatomy of The Rectum

Embryology of the rectum

The embryonic gastrointestinal tract begins developing during the fourth week of gestation. The primitive gut is derived from the endoderm and divided into three segments: foregut, midgut, and hindgut. Both midgut and hindgut contribute to colon, rectum, and anus. The midgut develops into the small intestine, ascending colon, and proximal transverse colon, and receives blood supply from the superior mesenteric artery. During the sixth week of gestation, the midgut herniates out of the abdominal cavity, and then rotates 270 degrees counter clockwise around the superior mesenteric artery to return to its final position inside the abdominal cavity during the tenth week of gestation(**Chang et al.,2011**).

The hindgut follows the midgut, in the embryo, and extends from the posterior intestinal portal to the cloacal membrane which is composed of endoderm of the cloaca and ectoderm of the proctodeum or anal pit. The hindgut gives rise to the left one-third to one-half or distal portion of the transverse colon, the descending colon, the sigmoid or pelvic colon, the rectum, the upper portion of the anal canal, and part of the urogenital system (e.g., the bladder and urethra). It is supplied by the inferior