Colorectal Cancer

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Outlines:

1. Definitions
2. Polyps
3. Basics of colorectal cancer
4. Surgery
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Females slides -Extra

Correction File

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Definitions

- Colon = large bowel = large intestine.
- Rectum - terminal portion of the colon.

Doctor Notes about this part

- The rectum has the intraperitoneal and extraperotineal part, Same as colon but has an only different : The Rectum has no serosa.
- Bowel wall from an inner layer to outer layer : Mucosa , Submucosa , muscularis propria and Serosa.
- For the rectum:Mucosa, Submucosa,Muscularis propria, mesorectal fat
- So, T3 of the colon = T4 of the rectum
- Any growth above the basement membrane is benign, whenever it reaches the basement membrane it's considered as malignant tumor and it can metastasize (through lymphatic+blood vessels)"
- Rectal cancer give them Radiation because of the high recurrence which is within bony pelvis.
- Polyp - benign growth; not invasive, most common pathology in colon, Probably after 50 years of age you going to find 25% - 50% of the population they have polyps in the colon. Not every polyp turn to cancer but almost all cancers can come from the polyp so I have to remove the polyp to prevent the cancer.


"Whoa, Frank ...
guess what youuuuuuuuu sat in!"

*What are the criteria to screen cancers? Why we do screening for colon cancer?

- Common
- Metastasis can be prevented by removal of polyp.
- Treatable in its early stages. E.g. in colon cancer stage 1 = 5 years survival.
- Cost effective :Simple tests to detect.

5 Years survival: is a method used to show prognosis and effectiveness of the treatment.

***Adenoma - type of Polyps:**

Polyp: Benign or Malignant:

Neoplastic polyps such as adenomatous "2% تتحول" Adenomatous polyp has villous and tubular.

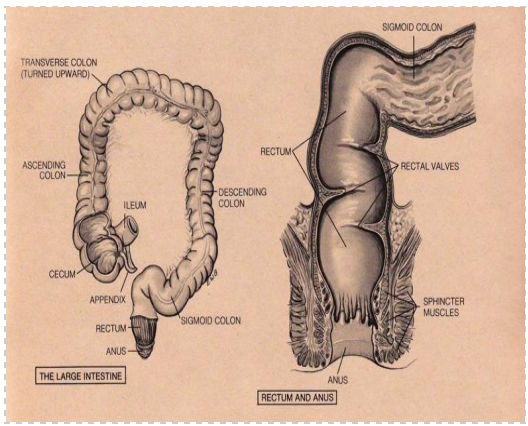
Non-neoplastic such as hyperplastic, inflammatory, pseudopolyps …. etc. هذي كلها ما تتحول

Cancer

- Cancer - malignant growth; invasive, invasion to basement membrane which located between Muscularis Mucosa and lamina propria contains lymphatics and Blood vessel
- Stage - where the cancer is growing "The first step."
- Primary - the original tumour, where it started
- Metastases - where the tumour has spread to

A cancer cell is:

Immortal(lives longer) ,multiplies uncontrollably, can live on its own without neighbors, can live in other parts of the body



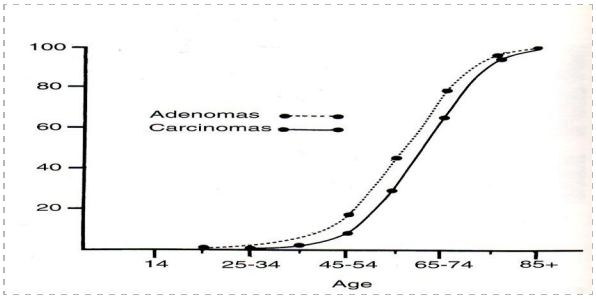
Colorectal Cancer

Most cancers are acquired some are inherited
Almost all cancers begin as a benign polyp or adenoma
Only a tiny percentage of adenomas become cancers.
Colon cancer Presentations: Complication of IBD , Familial Adenomatous Polyposis (FAP) Syndrome, Hereditary nonpolyposis colorectal cancer (HNPCC) or Sporadic (Acquired).

Screening:

The Effect of Age on the Incidence of Colorectal Cancer and Colorectal Polyps
We start screening over the age of 40.

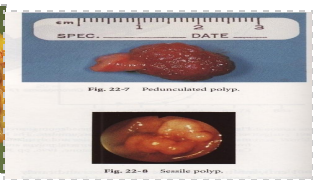
Patients with average risk + no family history the colonoscopy will be every 10 years.
High risk patients the colonoscopy will be every 5 years.

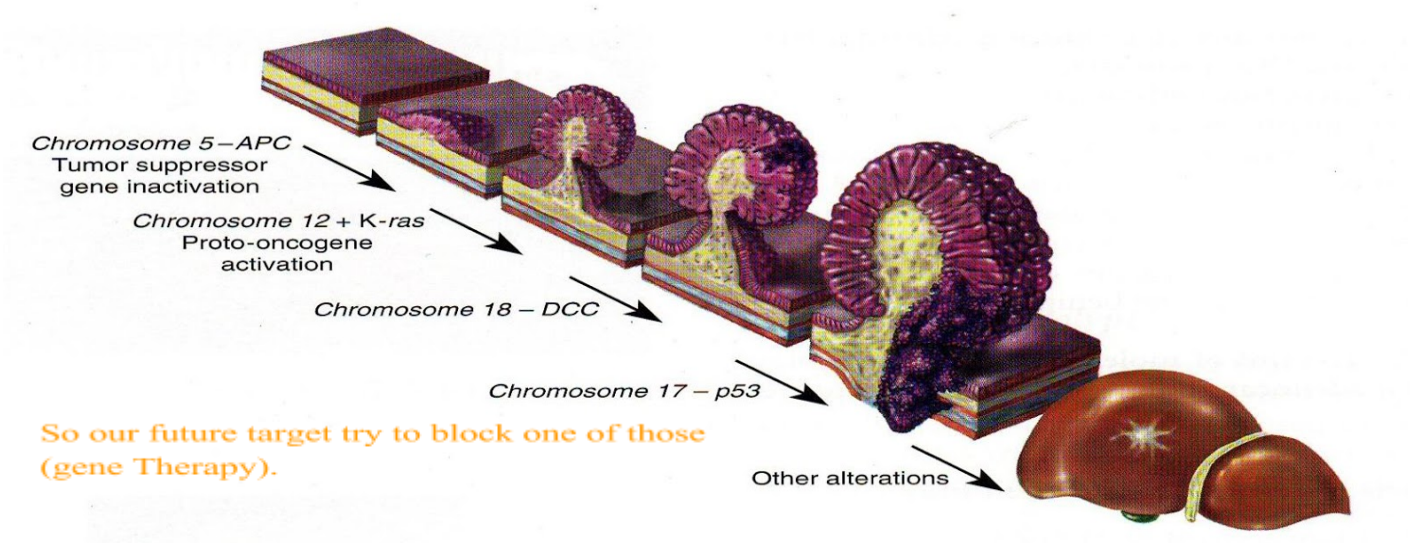


Polyp - Cancer Sequence so polyp in these case need to be removed.

The process from benign polyp to cancer takes from 7 - 10 years
The transformation into cancer is based on

- the type of polyp.
- Size of polyp.
- Multiple polyps = greater risk of cancer





So our future target try to block one of those (gene Therapy).

Removing polyps prevents cancer: Colonoscopy

Colorectal Carcinoma

Classification

The doctor said: اعرفوا ال adenocarcinoma وجزاكم الله خير ☺

Adenocarcinoma 95%

Carcinoid common in rectal can be found by DRE

Lymphoma

Sarcoma

Squamous cell carcinoma more common in long-standing ulcerative colitis.

Epidemiology

3th most common malignancy worldwide.

1st most common in Saudi males.

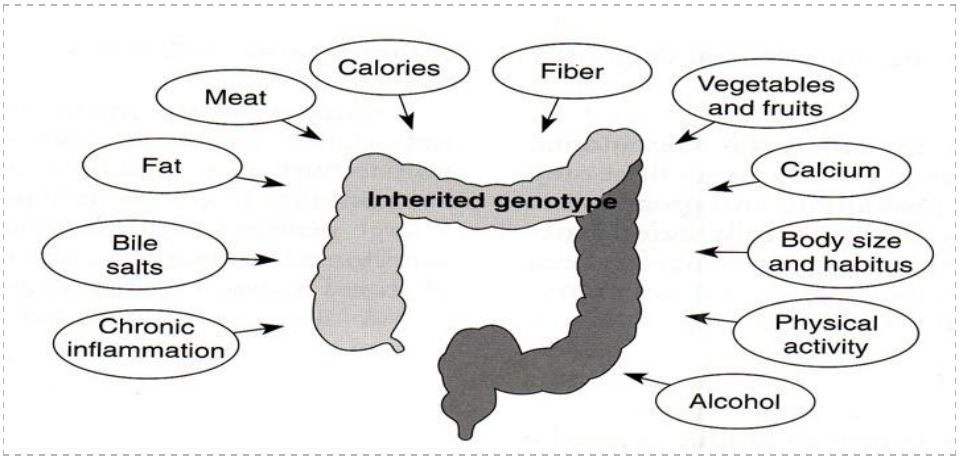
second to lung cancer as a cause of cancer death

21,500 new cases, 8900 will die (2008)

risk of CRC – women 1/16 , men 1/14

peak incidence in 7th decade but it can occur at any age

Etiology of Colorectal Cancer



Risk Factors

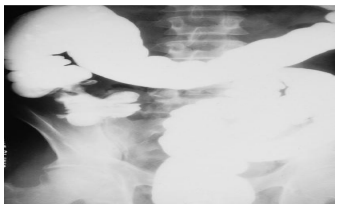
Male gender, Increasing in age Genetics, Family history : Personal history of colon cancer One first degree family member doubles risk.	Hereditary colorectal cancer syndromes. Polyps. Inflammatory bowel disease: Ulcerative colitis > Crohn's disease, age, previous colon cancer.	Other Diet " risk factor was high fat ,red meat and dietary ca and vit-D deficiency " in other side high fiber diet was protective factor. , nutrients, smoking, alcohol , lack of physical exercises ETOH.
Protective agents: -Aspirin , NSAID , dietary ca and vit-D supplement		

Colorectal Cancer (CRC) Risk Based on Family History

Amsterdam criteria : is a criteria used to detect Hereditary nonpolyposis colorectal cancer **(HNPCC).**	
General population	6%
One 1st degree CRC	2-3X* (12-18%)
Two 1st degree CRC	3-4X*
One 1st degree CRC < 50 y	3-4*
One 2nd or 3rd CRC	1.5X
2 2nd degree CRC	2-3X*
1 first degree with polyp	2X*

Clinical presentation

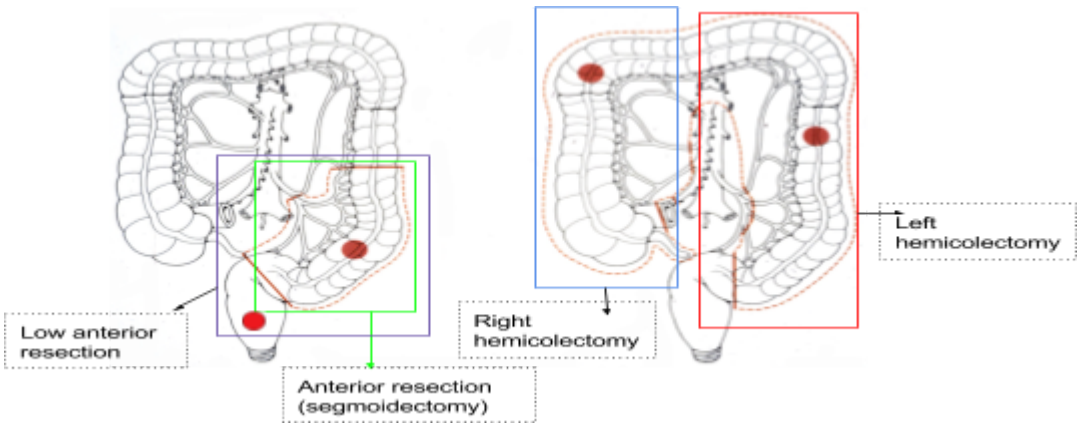
- Abdominal pain and bleeding per rectum are the most common.
- Bleeding - gross, occult, anemia (37%)
- Change in bowel habit happens when the tumor grow – pain, diarrhea, constipation, alternating pattern
- Obstruction – more common with left sided lesions most common cause of bowel obstruction in the elderly
- Vague abdominal pains "colicky"
- Change in caliber of the stools
- Weight loss
- Abdominal mass especially in right sided colon cancer.
- Tenesmus over 50% occur with low rectal cancer
- Asymptomatic

Investigations		
General	Staging	Bloodwork
Complete history and physical , Digital Rectal Examination (DRE) used to detect low cancer Endoscopic (identify primary, synchronous lesions) Flexible sigmoidoscopy Colonoscopy and CT CAP (chest , abdomen, pelvis) scan is the investigation of choice. Colonoscopy used to: • Diagnose. • Take biopsy. • Exclude synchronous lesions. CT colonography used to: • Assess the local extent of the disease. • Roll out Metastasis. 	Looking for signs of advanced disease such as cachexia, ascites or jaundice. Endorectal ultrasound (rectal cancer). Chest x-ray (metastases) Liver ultrasound and LFTs (metastases) Abdominal CT scan (metastases) Other tests based on history and physical exam (e.g., head C or left arm weakness looking or brain metastasis).	CBC electrolytes, The carcinoembryonic antigen CEA (tumour marker). Don't use CEA as screening as well as diagnostic. Use it only for staging. CEA give us two things : 1- Idea about the prognosis. 2- Follow up. colon or rectal cancer should undergo CT of the chest and abdomen and pelvis.

Colorectal Cancer Treatment:

Surgical therapy

- Surgery is the most important (the mainstay treatment) variable in the treatment of colorectal cancer
- Chemo is only used to decrease the recurrence.
- Radiation and chemotherapy alone cannot cure any stage of colorectal cancer
- The site of tumour dictates the basic procedure



See here,if the lesion is in the right colon we usually resect the whole Right side of the colon, for fear of mets!! Because the Rt. colon shares the blood & lymphatics. And the same applies for the rest of tumor locations.

Principles of colorectal cancer Surgery

1. Examine the entire abdomen
2. Remove the appropriate segment of the colon with adequate margins (5cm to the left of the tumor & another 5cm to the right+ the draining Blood supply+adequate number of LN)
3. Remove the corresponding lymph nodes

Open vs laparoscopic approach (the doctor didn't talk about it)

Surgery for rectal cancer:

is excision of the entire mesorectum by using transanal endoscopic microsurgery (TEM)
colonic J-pouch " ileo-anal" may formed to improve defecation functions.

preparation for surgery :

1- patient should be fasted prior to surgery.
2- comorbidity should be addressed.
3- perioperative broad-spectrum antibiotic.
4- thromboprophylaxis " LMWH " to reduce risk of DVT and PE.

Emergency colorectal resection:

in case of perforation or obstruction of colorectal cancer.

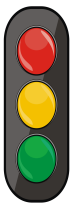
Who Gets Additional Treatment?	
Colon Cancer	Rectal Cancer
• All stage 3 patients (positive nodes) - chemotherapy • High risk stage 2 patients-Chemotherapy (no adequate lymph nodes harvesting, i.e. Negative <12 lymph nodes)	All stage 2 and stage 3 patients should get radiation and chemotherapy

Follow up (post-surgery)

- Office visit every 3 months for two years then every 6 months for 3 years
- Regular blood work with CEA (carcinoembryonic antigen)
- Colonoscopy at year 1, at year 4, and then every 5 years
- CT scan yearly

IMPORTANT

Staging (Where is the tumor Growing?) (most important part of the lecture!!!)



How far into the wall has it grown? T stage	
Tis	invasion of mucosa only (malignant polyp, high grade metaplasia)
T1	Invasion of submucosa
T2	Invasion of muscularis propria
T3	Full thickness/perirectal fat (mucosa, submucosa & muscularis propria,not considered in the rectum⇒ T2 to T4 directly)
T4	Invasion into adjacent organs (this is not considered as metastasis, its only a pure direct extension of the cancer to the adjacent organ (e.g: urinary bladder)

How many lymph nodes have been involved? N stage	
N0	No lymph nodes involvement
N1	1-3 lymph nodes
N2	>4 lymph nodes
N3	distant lymph nodes

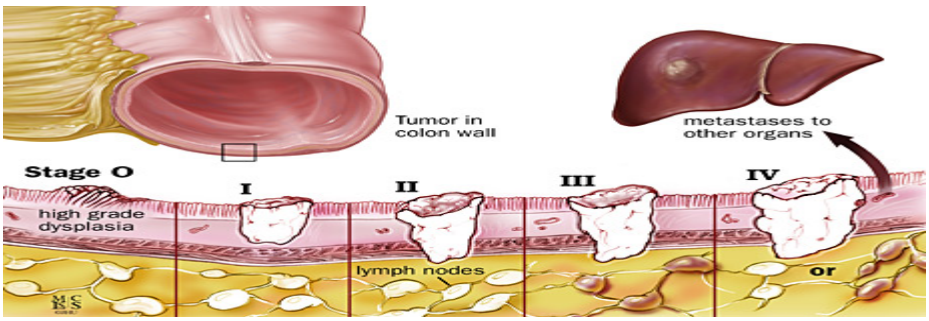
Are there distant organ metastasis? M stage	
M0	No distant organ mets
M1	Distant organ (e.g: liver, lung)

Based on the TNM classification, we have **4 stages** of Colorectal Cancer:		5-Year Survival chance
Stage 1	T1 and T2 tumors (No nodes nor mets)	90%
Stage 2	T3 and T4 tumors (No nodes nor mets)	80%^
Stage 3	Any lymph node involvement (+ve node/s with any T)	27-69%*
Stage 4	Distant metastases (+ve mets with any T)	8%

^for T3N0 tumors

*depends on # (the number) of nodes involved

If the pt is on stage 2, but you only removed 8 from 12 and were -ve (inadequate LN harvesting), still there's a high chance of malignancy⇒ call it high risk stage 2⇒ give chemo..



Pathology of Colorectal Cancer

Macroscopic:	Microscopic (differentiation):
two third are ulcerating, other types are polypoidal, ulcerating and stenosing	• Well differentiated • Moderately differentiated • Poorly differentiated: tumors have mucinous histology has a poor prognosis • Lymph node involvement via the portal blood to the liver or by transperitoneal seeding, low rectal tumours may involve the inguinal node

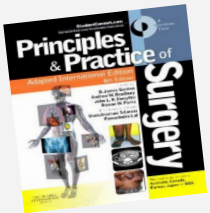
Summary:

- Common Cancer

two-third of all large bowel cancers occur in the rectum and sigmoid colon and the most clinical feature are change in bowel habit and blood per rectum.

Diagnosis is done by colonoscopy and biopsy , CT colonography or barium enema "apple core sign" preoperative staging involves CT, MRI and PET-CT scanning.

- Can be prevented through screening and resection of polyps
- Surgery is the primary treatment, involving radical local clearance combined with regional lymphadenectomy
- Slow but steady improvement in survival



Types of Polyps:

Types	Types	what is it?	chance of malignancy	Diagnosis	management
colorectal adenoma	solitary neoplastic	classified as tubular, tubulo-villous or villous adenomas, depending on their histological	Villous adenomas has 30% chance of malignancy. tubular adenoma is around 10%. Multiple adenomas are 24%.	The majority are asymptomatic, but symptoms include rectal bleeding or large bowel colic . polyp may prolapse through the anus. Patients with giant villous adenoma of the rectum may present with severe watery diarrhea which lead to hyokalaemia.	Colonoscopic polypectomy. Follow up: colonoscopy is recommended after 6–12 months and 2–3 year.
Familial adenomatous polyposis	multiple neoplastic	is inherited as an autosomal dominant trait.It's single gene disorders. the gene responsible is APC, which is located on the long arm of ch.5	Adenomatous polyps usually develop dur-ing teenage years and early adulthood, with > 90% chance of colorectal cancer.	clinicopathological diagnosis : requires the presence of > 100 adenomatous polyps of the large bowel established by -sigmoidoscopy - biopsy. - gene analysis	Prophylactic surgical resection of the large bowel is indicated for familial adenomatous polyposis.
Juvenile polyposis syndrome	multiple non-neoplastic	is an autosomal dominant genetic disorder		Causal mutations of the SMAD4 or BMPR1A/ALK3 genes	
Metaplastic associated polyposis	multiple non-neoplastic	autosomal recessive	very high risk	Histologically, has a sawtooth pattern.	prophylactic colectomy and ileorectal anastomosis

MCQS:

57 year old woman presents with adenocarcinoma of the right colon laboratory evaluation demonstrates an elevation of CEA to 123 ng/ml. Which of the following is the most appropriate use of CEA testing in colorectal cancer:
A.Screening.
B.To determine which patient should get adjuvant therapy.
C.To monitor postoperative recurrence.

After complete removal of sessile polyp of 2x1.5 cm found 1 finger length above the anal region. The pathologist reports it to have been a villous adenoma that contained carcinoma in situ(CIS). Which of the following is the most appropriate next step in management:
A.Reexcision of the biopsy site with wider margins.
B.No further therapy.
C.Radiation therapy to the rectum.

Ans:C,B(CIS)

Surgical Recall

What is the lifetime risk of colorectal cancer? 6%

What is the incidence of rectal cancer? Comprises 20% to 30% of all colorectal cancer

What Other risk factors for colorectal cancer?

Family history is important when taking history FAP, Lynch's syndrome⇒ HNPCC Hereditary NonPolyposis Colon Cancer—autosomal-dominant inheritance of high risk or development of colon cancer.

What signs/symptoms are associated with the following conditions:

Right-sided lesions	Left-sided lesions
Right side of bowel has a large luminal diameter, so a tumor may attain a large size before causing problems. Microcytic anemia, occult/melena more than hematochezia(left sided) PR, postprandial discomfort, fatigue	Left side of bowel has smaller lumen and semisolid contents. Change in bowel habits (small-caliber stools), colicky pain, signs of obstruction, abdominal mass, heme(+) or gross red blood. Nausea, vomiting, constipation.

What unique diagnostic test is helpful in patients with rectal Cancer?
Endorectal ultrasound (probe is placed transanally and depth of invasion and nodes are evaluated).

What are the signs/ symptoms of rectal cancer?
Most common symptom is hematochezia (passage of red blood stool) or mucus; also tenesmus, feeling of incomplete evacuation of stool (because of the mass), and rectal mass.

What disease does microcytic anemia signify until proven otherwise in a man or postmenopausal woman? Colon cancer.

What are the current recommendations for colorectal cancer screening if there is a history of colorectal cancer in a first-degree relative less than 60 years old?
Colonoscopy at age 40, or 10 years before the age at diagnosis of the youngest first-degree relative, and every 5 years thereafter.
What are the white lines of Toldt?Lateral peritoneal reflections of the ascending and descending colon.

What is the blood supply to the rectum:	
Arteries	Veins
Proximal? Superior hemorrhoidal (or superior rectal) from the IMA. Middle? Middle hemorrhoidal (or middle rectal) from the hypogastric (internal iliac). Distal? Inferior hemorrhoidal (or in erior rectal) from the pudendal artery (a branch of the hypogastric artery).	Proximal? Via the IMV to the splenic vein, then to the portal vein. Middle? Via the iliac vein to the IVC. Distal? Via the iliac vein to the IVC.

What parts of the GI tract do not have a serosa?
Esophagus, middle and distal rectum.

How are they anatomically classified?Sessile (flat), Pedunculated (on a stalk)

What are the histologic classifications of the following types:
Inflammatory (pseudopolyp)?
As in Crohn's disease or ulcerative colitis
Hamartomatous? Normal tissue in abnormal configuration
Hyperplastic? Benign—normal cells—no malignant potential
Neoplastic? Proliferation of undifferentiated cells; premalignant or malignant cells

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