Benign And Malignant Tumors Of The Rectum

1 . Benign tumors

2. Malignant tumors

Benign rectal tumors

The most frequent are polyps.

Polyp is a localised elevated lesion arising from an epithelial surface.

Polyp - adenoma : 90%

- other (inflammatory, hyperplastic etc.) : 10%

2 types of adenoma : tubular (pedunculated) 20%

villous (sessile) 80%

Neoplastic Polyps

- These lesions are dysplastic
- The risk of malignant degeneration is related to both the size and type of polyp.
- Tubular adenomas are associated with malignancy in only 5% of cases
- Villous adenomas may harbor cancer in up to 40%
- Tubulovillous adenomas are at intermediate risk (22%)
- Invasive carcinomas are rare in polyps smaller than 1 cm

- Polyps may be pedunculated or sessile
- Pedunculated polyps : Colonoscopic snare excision
- Sessile polyp: Transanal operative excision
- The site of sessile polypectomies should be marked by injection of methylene blue or India ink to:
  - guide follow-up colonoscopy sessions
  - ensure that the polyp has been completely removed
  - facilitate identification of the involved bowel segment should operative resection be necessary

- Colectomy is reserved for
  - large, flat lesions
  - focus of invasive cancer is confirmed in the specimen.

- These patients may be ideal candidates for laparoscopic colectomy

Hamartomatous Polyps (Juvenile Polyps)

- Not usually premalignant
- These lesions are the characteristic polyps of childhood but may occur at any age.
- Bleeding is a common symptom and intussusception and/or obstruction may occur.
- Because the gross appearance of these polyps is identical to adenomatous polyps, these lesions should also be treated by polypectomy.

- **Familial juvenile polyposis**

  - Autosomal dominant disorder
  - Annual screening :between the ages of 10 and 12 years.

    Treatment is surgical and depends in part upon the degree of rectal involvement.
  - If the rectum is relatively spared, a total abdominal colectomy with ileorectal anastomosis may be performed
  - If the rectum is carpeted with polyps, total proctocolectomy is the more appropriate operation

Peutz-Jeghers syndrome

- polyposis of the small intestine, and lesser extent, polyposis of the colon and rectum.
- Characteristic melanin spots are often noted on the buccal mucosa and lips of these patients.
- Not at significant risk for malignant degeneration.
- Carcinoma may occasionally develop.
- Because the entire length of the gastrointestinal tract may be affected, surgery is reserved for symptoms such as obstruction or bleeding or in whom polyps develop adenomatous features.
- Screening consists of a baseline colonoscopy and upper endoscopy at age 20 years, followed by annual flexible sigmoidoscopy thereafter.

Cronkite-Canada syndrome

- Gastrointestinal polyposis in association with alopecia, cutaneous pigmentation, and atrophy of the fingernails and toenails.
- Diarrhea is a prominent symptom, and vomiting, malabsorption, and protein-losing enteropathy may occur
- Surgery is reserved for complications such as obstruction

Cowden's syndrome

- Autosomal dominant disorder
- hamartomas of all three embryonal cell layers
- Facial trichilemmomas, breast cancer, thyroid disease, and gastrointestinal polyps are typical of the syndrome.
- Treatment is otherwise based upon symptoms

Inflammatory Polyps (Pseudopolyps)

- Not premalignant
- Microscopic examination shows islands of normal, regenerating mucosa (the polyp) surrounded by areas of mucosal loss.
- Polyposis may be extensive, especially in patients with severe colitis, and may mimic familial adenomatous polyposis.

Familial Adenomatous Polyposis

- Autosomal dominant condition
- 1% of all colorectal adenocarcinomas.
- The genetic abnormality in FAP is a mutation in the APC gene, located on chromosome 5q.
- most patients with FAP will have a known family history of the disease, up to 25% present without other affected family members.
- Clinically, patients develop hundreds to thousands of adenomatous polyps shortly after puberty.
- The lifetime risk of colorectal cancer in FAP patients approaches 100% by age 50 years.

- Flexible sigmoidoscopy of first-degree relatives of FAP patients beginning at age 10 to 15 years
- APC gene testing may be used to screen family members
  - Positive: annual flexible sigmoidoscopy beginning at age 10 to 15 years
  - Negative: screening starting at age 50 years

- FAP patients are also at risk for the development of adenomas anywhere in the gastrointestinal tract, particularly in the duodenum.

- Periampullary carcinoma is a particular concern.

- Upper endoscopy is therefore recommended for surveillance every 1 to 3 years beginning at age 25 to 30 years

- Treatment is surgical
- Three operative procedures can be considered
  - total proctocolectomy with either an end (Brooke's) ileostomy or continent (Kock's) ileostomy
  - total abdominal colectomy with ileorectal anastomosis
  - restorative proctocolectomy with ileal pouch–anal anastomosis with or without a temporary ileostomy

Hereditary Nonpolyposis Colon Cancer (Lynch's Syndrome)

- more common than FAP
- extremely rare (1 to 3%)
- The genetic defects associated with HNPCC arise from errors in mismatch repair and study of this syndrome has elucidated many of the details of the RER pathway.
- an autosomal dominant pattern
- development of colorectal carcinoma at an early age
- The risk of synchronous or metachronous colorectal carcinoma is 40%. HNPCC may also be associated with extracolonic malignancies, including endometrial, ovarian, pancreas, stomach, small bowel, biliary, and urinary tract carcinomas.

- Screening colonoscopy: recommended annually for at-risk patients beginning at either age 20 to 25 years or 10 years younger than the youngest age at diagnosis in the family, whichever comes first.

- Because there is a 40% risk of developing a second colon cancer, total colectomy with ileorectal anastomosis is recommended once adenomas or a colon carcinoma is diagnosed, or if prophylactic colectomy is decided upon.

- Annual proctoscopy is necessary because the risk of developing rectal cancer remains high.

- Similarly, prophylactic hysterectomy and bilateral salpingo-oophorectomy should be considered in women who have completed childbearing.

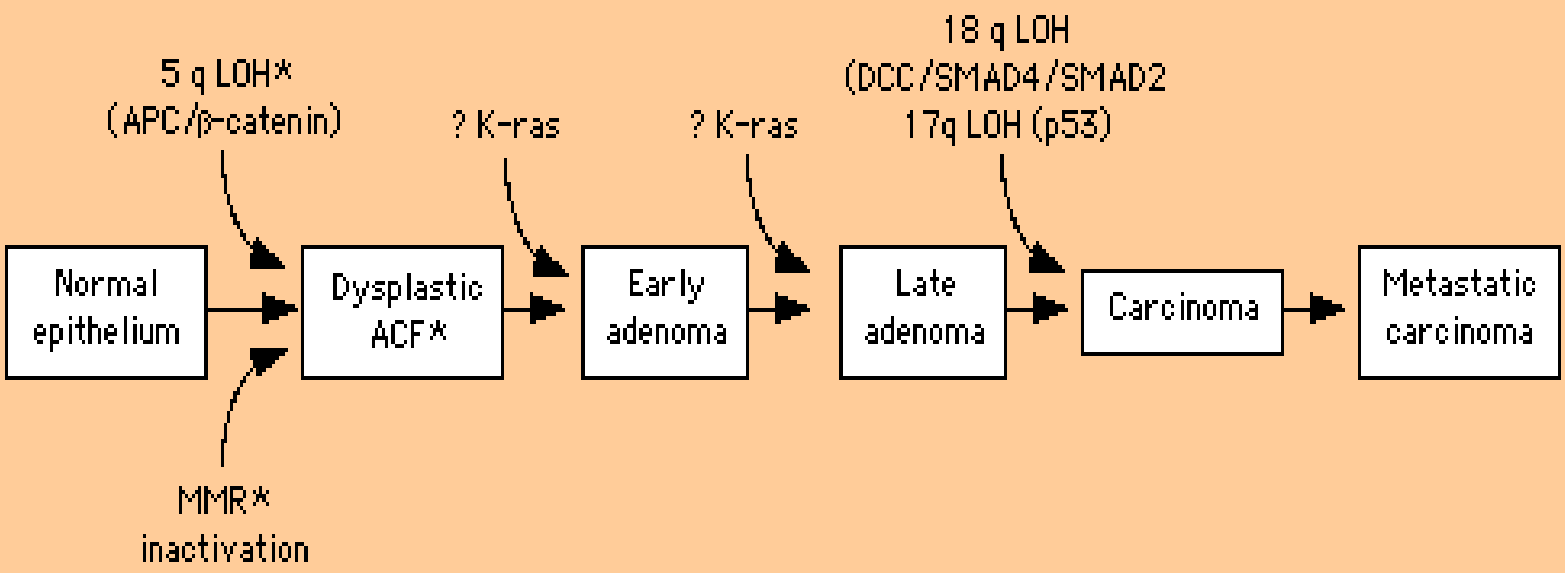
Familial Colorectal Cancer

- Nonsyndromic familial colorectal cancer accounts for 10 to 15% of patients with colorectal cancer.

- Screening colonoscopy is recommended every 5 years beginning at age 40 years or beginning 10 years before the age of the earliest diagnosed patient in the pedigree.

- No specific genetic abnormalities are associated with familial colorectal cancer, the defects found in either the LOH pathway or RER pathway may be present in these patients.

Adenoma Carcinoma sequence



*: LOH: loss of heterozygosity; DCC: deleted in colon cancer gene; APC: adenomatous polyposis coli gene; ACF: aberrant crypt foci; MMR: DMA mismatch repair enzyme

† Modified from: Lynch, JP, Hoops, TC. The genetic pathogenesis of colorectal cancer. Hematol Oncol Clin North Am 2002; 16:775.

Rectal carcinoma

Factors associated with increased risk for CRC

- Lack of physical activity
- Consumption of red meat
- Obesity
- Cigarette smoking
- Alcohol use

Factors associated with decreased risk for CRC

- MVI containing folic acid
- ASA and other NSAID's
- Post menopausal HRT
- Ca supplementation
- Selenium
- Consumption of fruits, vegetables and fiber

- Rectal cancer (adenocarcinoma) arising from the epithelial cells of the rectal mucosa.
- 50% of all colorectal tumors are located in the rectum
- The incidence rate rises dramatically during the fifth decade of life
- Increased risk of colorectal cancer associated with cigarette smoking is dependent on the molecular characteristics of the tumor as defined by *APC* mutation and *hMLH1* expression status

Clinical Presentation

- Rectal bleeding
- Changes in bowel habits
- Increased frequency of defecation, decreased caliber of the stools, mucus with stools, or mucous diarrhea
- Sense of fullness,tenesmus,increased straining during defecation.
- Sacral or deep pelvic pain
- Anal pain (occurs when low rectal cancer invades the anal canal)
- Incontinence supervenes when the anal sphincter is involved

- Liver is the most frequent site of metastasis, followed by the lung, retroperitoneum, ovary, peritoneal cavity, and rarely the adrenal glands

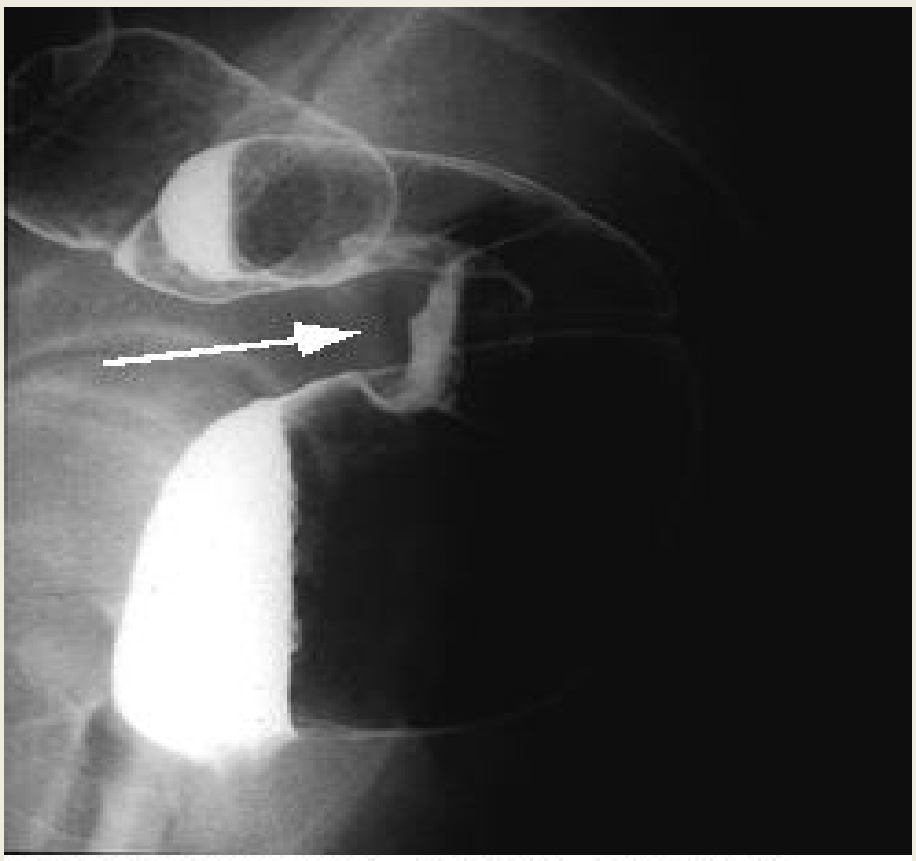
Physical examination

Digital rectal examination

- Feel for a mass, assess its location and mobility
- Depth of invasion and whether the tumor is tethered or fixed
- Pelvic examination in women
- Prostate assessment in men

A weak or incompetent sphincter may favor a colostomy.

- Rigid proctosigmoidoscopic examination
- If not obstructed, patients with rectal cancer should have a preoperative double-contrast barium enema or preferably a colonoscopy to assess for synchronous colon cancer (2% to 9%)



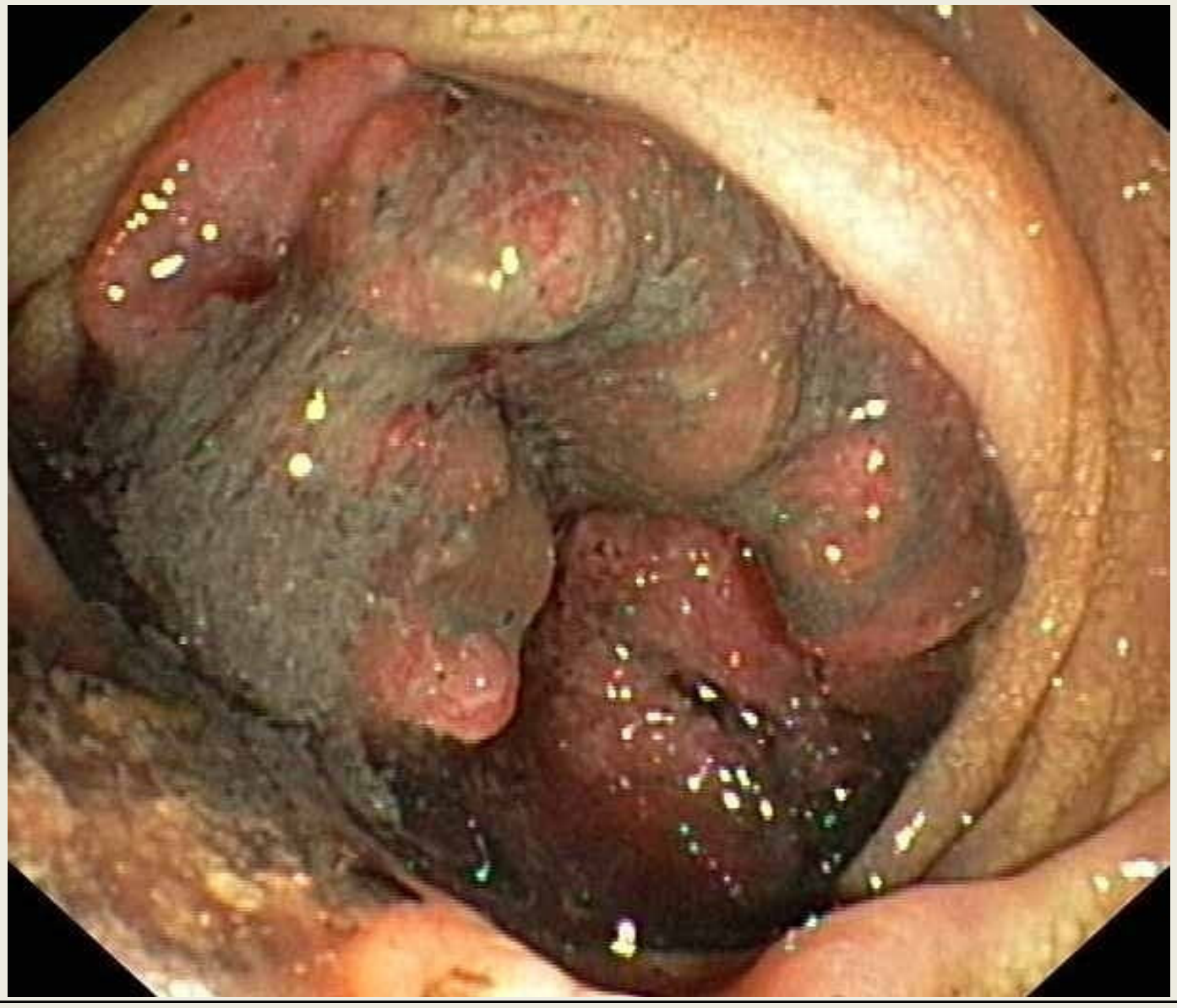
Rectal cancer Double-contrast barium enema shows an eccentric mass arising from the anterior wall of the rectum (arrow). Courtesy of Jonathan Kruskal, MD, PhD.

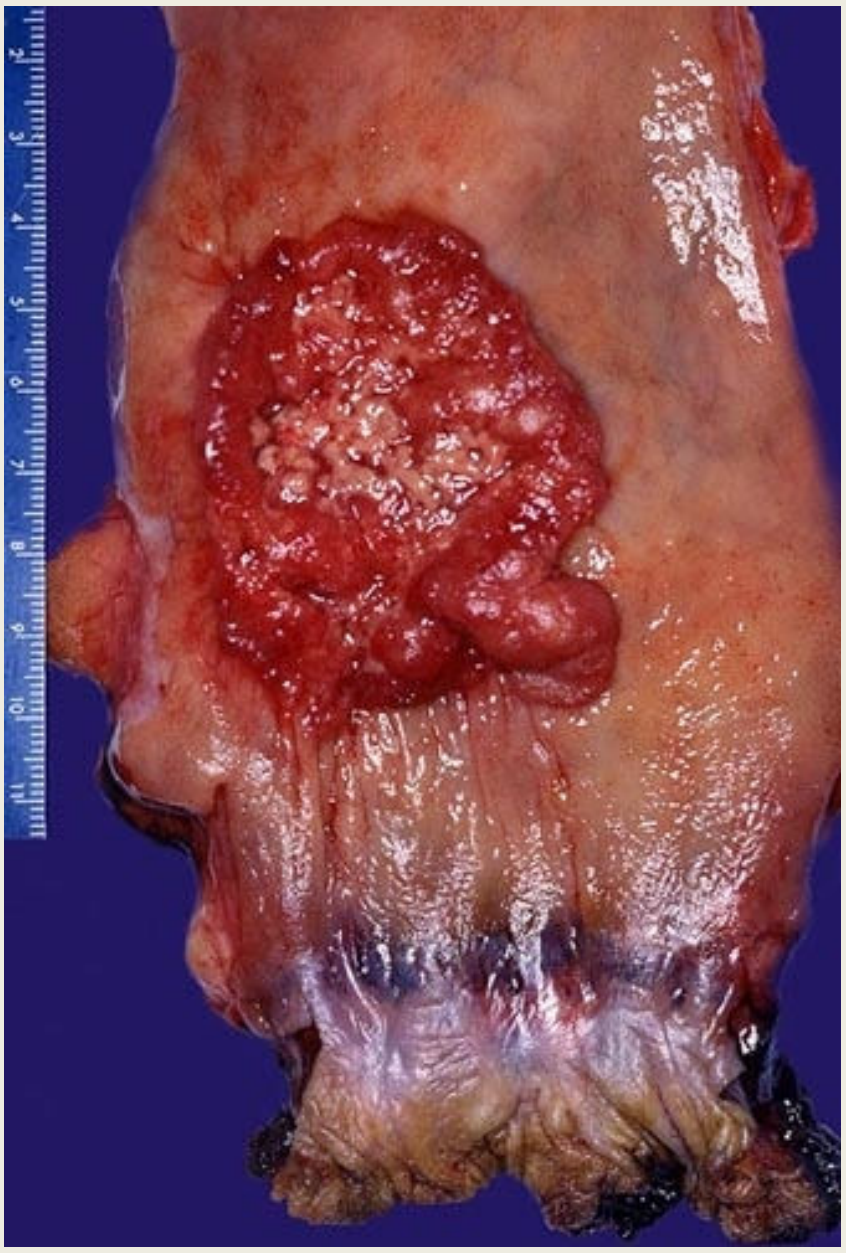
Endorectal ultrasound

- Depth of tumor invasion into the rectal wall
- Nodal enlargement
- Malignant nodes are differentiated from reactive nodes by being hypoechoic, hypervascular, and irregular

- CECT scan abdomen &pelvis
- MRI for patients with locally advanced and recurrent rectal cancer requiring an exenterative procedure.
- Plain chest radiograph
- Laboratory studies
- Carcinoembryonic antigen (CEA) level

Up to 95% of patients with advanced hepatic metastasis will have a CEA level above 20 ng/mL.





Staging

AJCC*, Modified Astler-Coller (MAC) and Duke's Staging Systems for Colorectal Cancer†

	TNM			MAC§	Duke's
Stage 0	Tis	N0	M0	-	
Stage I	T1	N0	M0	A	A
	T2	N0	M0	B1	A
Stage IIA	T3	N0	M0	B2	B
IIB	T4	N0	M0	B3	
Stage IIIA	T1-2	N1	M0	C1	C
IIIB	T3-4	N1	M0	C2/3	
IIIC	any T	N2	M0	C1/2/3	
Stage IV	any T	any N	M1	D	-

* AJCC, American Joint Committee on cancer

§A Mucosal; above muscularis propria, no involvement of lymph nodes
B1 Into musclaris propria but above pericolic fat, no involvement of lymph nodes
B2 Into pericolic or perirectal fat, no involvement of lymph nodes
C1 Same penetration as B1 with nodal metastases
C2 Same penetration as B2 with nodal metastases
D Distant metastases

†Used with the permission of the American Joint Committee on Cancer (AJCC), Chicago, Illinois. The original source for this material is the AJCC Cancer Staging Manual, Sixth Edition (2002) published by Springer-Verlag New York, Inc.

Management

Surgical excision:

- Surgical resection of affected bowel with clear margins, along with the adjacent mesentery and at least 12 regional nodes
- For rectal tumors, total mesorectal excision with a distal surgical margin of at least 2 cm is recommended
- For tumors that are located within 6 cm of the anal verge, or involve the anal sphincter, wide surgical resection with abdomino-perineal resection and permanent colostomy is recommended
- Local excision, for palliative treatment or simple polyp removal

Radiation therapy:

- Postoperative radiation, with or without chemotherapy, significantly reduces local recurrence rates
- Common regimen incorporates infusional 5-fluorouracil (5-FU) as a radiosensitizer to boost the efficacy of pelvic radiation
- Administered as 45 to 55 Gy over 5 weeks

Systemic Chemotherapy

- 5-FU has been the mainstay of systemic chemotherapy for CRC
- Capecitabine was approved in 2001 as first-line therapy for metastatic CRC
- Irinotecan (Camptosar), Oxaliplatin (Eloxatin), Bevacizumab, Cetuximab

Carcinoid Tumors

- 25% of these tumors are found in the rectum.
- Most small rectal carcinoids are benign, and overall survival is greater than 80%.
- >60% of tumors greater than 2 cm in diameter are associated with distant metastases.
- less likely to secrete vasoactive substances than carcinoids in other locations, and carcinoid syndrome is uncommon in the absence of hepatic metastases.
- Small carcinoids can be locally resected, either transanally or using transanal endoscopic microsurgery.
- Larger tumors or tumors with obvious invasion into the muscularis require more radical surgery.