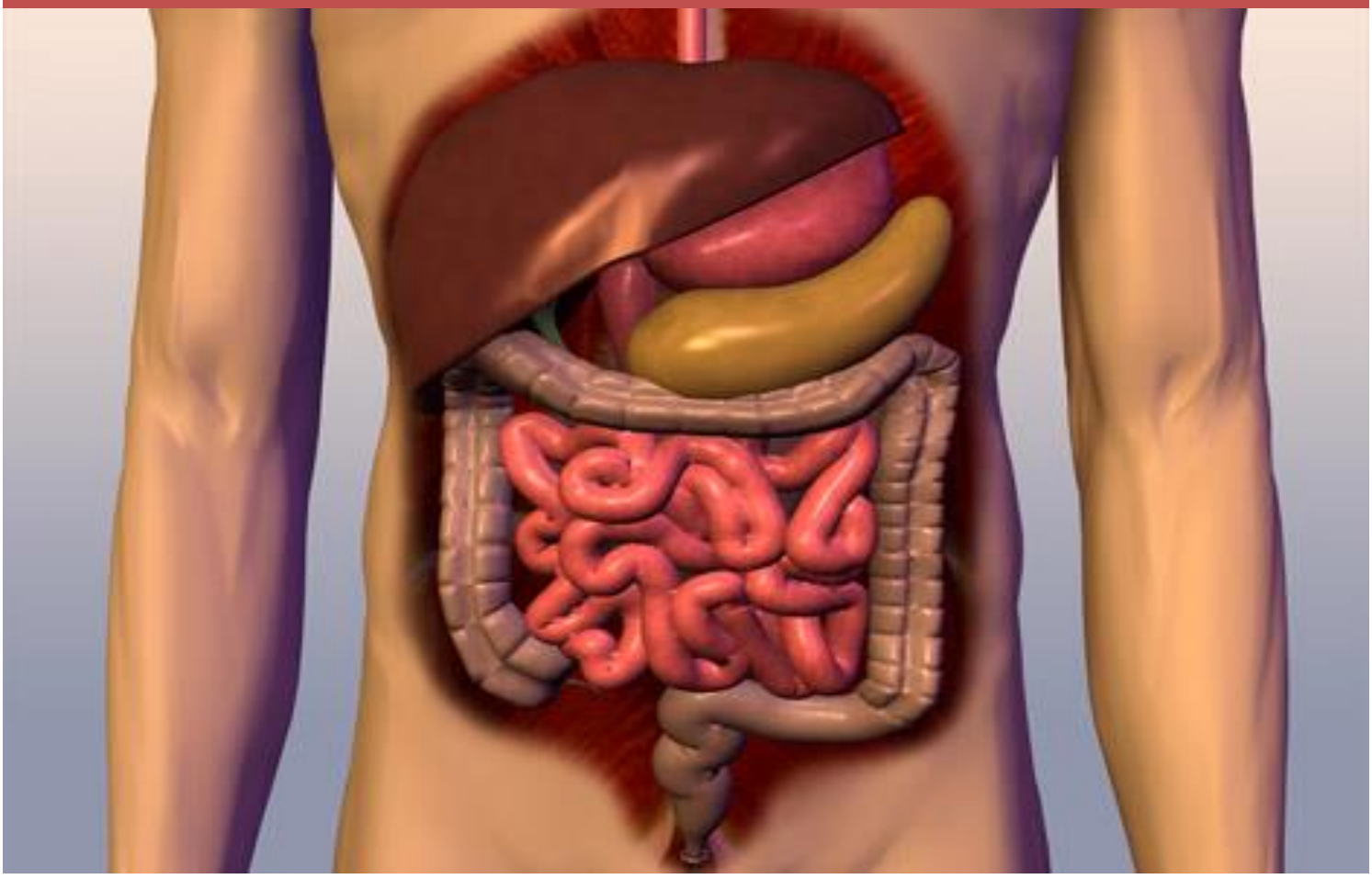

Lecture 6&7

Colonic Polyps and Carcinoma

432 ***Pathology*** *Team*

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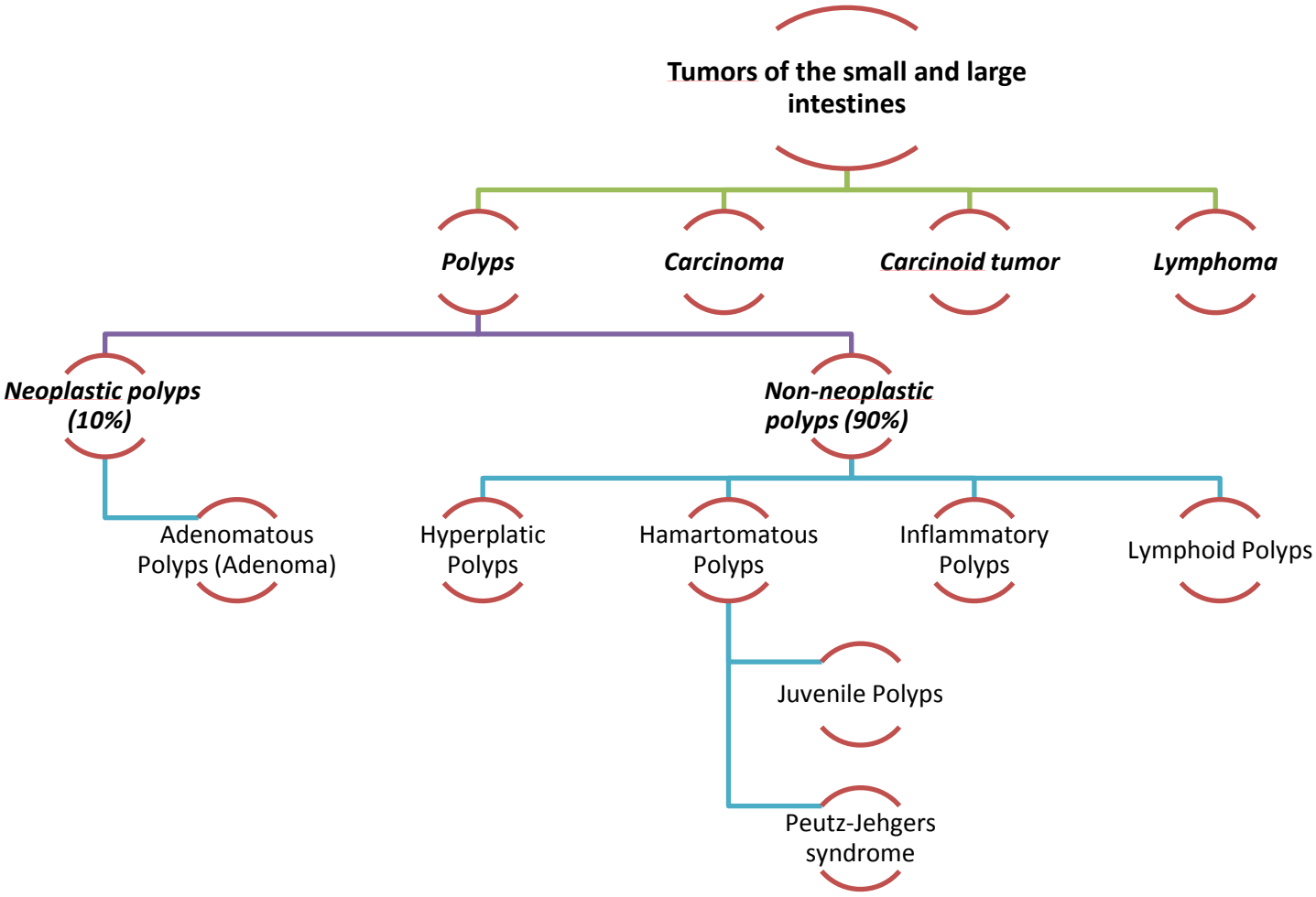
Reviewed By: Shahd *Al-Awwad* ***& Razan*** *Al-Hoqail*

GIT Block

Color Index: female notes are in Green. Male notes are in Blue. Red is important. Orange is explanation.

Colonic polyps and carcinoma

Mind Map:

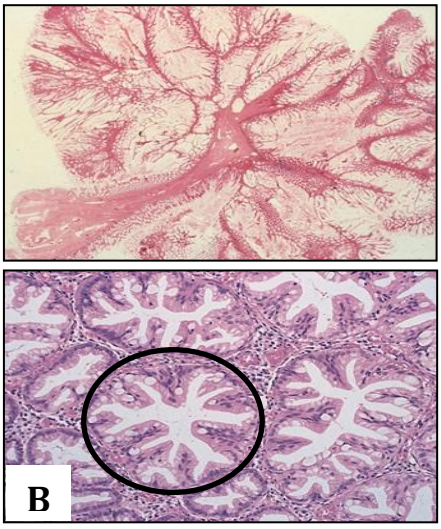


Polyps

Non-Neoplastic Polyps 90% (No Dysplasia)

NOTE: **Polyps: mass of mucosa that protrude into the lumen of the gut. Can be either pedunculated or sessile.**

1- Hyperplastic Polyp



- Asymptomatic (usually found in pt. when performing endoscopy for other reasons).
- > 50% are located in the rectosigmoid (Most commonly found in the left colon).
- Sawtooth surface (because of ↑number of cells).
- Star shaped crypts (Picture B). crypts = infolding forming polyps, & indicate high number of cells.
- Composed of well-formed glands and crypts lined by differentiated goblet and absorptive cells.
- Common in adults.

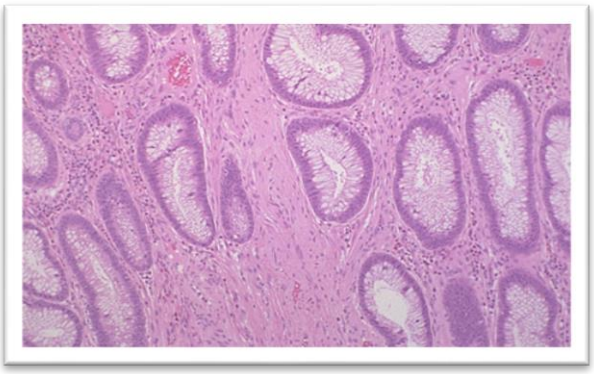
2- Hamartomatous polyp

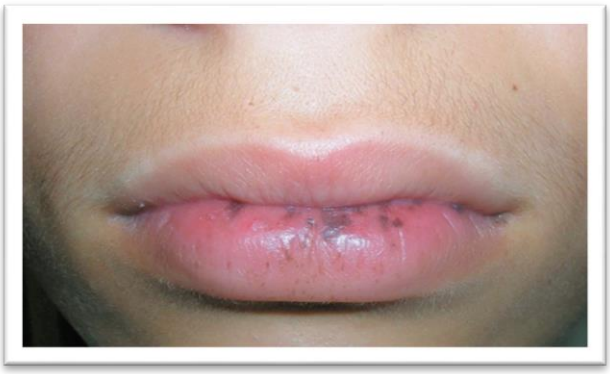
Juvenile Polyps (retention polyp)

- Developmental malformations affecting the glands and lamina propria. Glands = become dilated & cystic, and containing mucus (that's why we call it retention). And lamina propria = become edematous and inflamed.
- Commonly occur in children under 5 years old in the rectum. It may protrude out causing bleeding.
- In adult called retention polyp & in children call it Juvenile.
- Usually single polyp.

Peutz-Jehgers syndrome

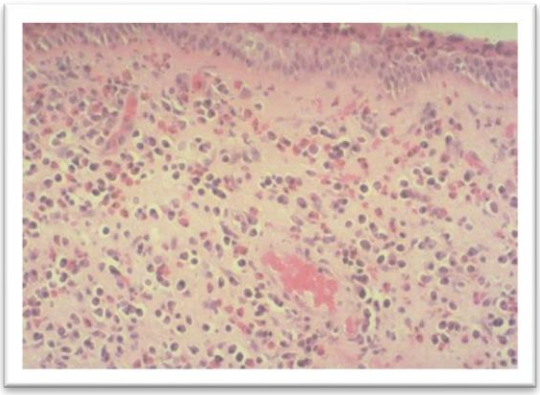
- Rare, autosomal dominant
- Hamartomatous polyps accompanied by mucosal and cutaneous pigmentation around the lips, oral mucosa, face and genitalia.
- Polyps tend to be large and pedunculated.
- Increased risk of developing carcinoma of the pancreas, breast, lung, ovary and uterus.
- Multiple polyps, found in GIT but mostly in small intestine.





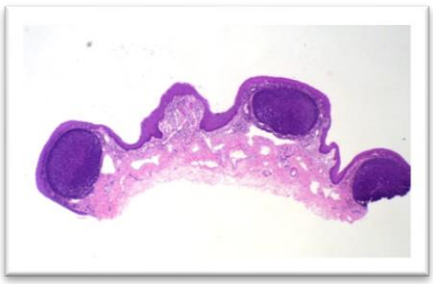
3- Inflammatory Polyps

- Longstanding IBD, especially in chronic ulcerative colitis.
- Represent an exuberant reparative response (healing response (Image) of inflammation & granulation tissue) to longstanding mucosal injury called pseudopolyps.



4- Lymphoid polyps

- Lymphoid collection below the lining epithelium but not related to “Hyperplasia of Peyer's patches"
- In biopsy: it has lymphoid follicles with germinal center in biopsy.
- May be associated with bleeding or prolapsed.
- Usually solitary, sessile and in rectum.



REMEMBER:

- Polyps are most common in the colon but may occur in the esophagus, stomach, or in small intestine.

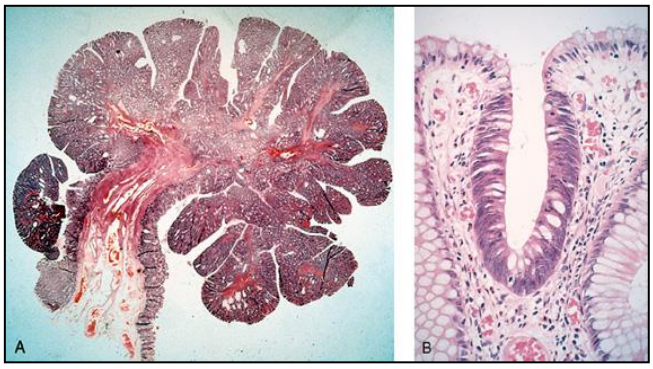
Neoplastic polyps 10% (Non-invasive dysplasia)

1- Adenomatous Polyp (adenoma)

- Benign tumor of the glands.
- Occur mainly in large bowel.
- Sporadic (1-2 polyps) and familial (Multiple polyps).
- Vary from small pedunculated to large sessile. (Sessile means attached directly to the base).
- Epithelium proliferation and **dysplysia**. (Hyperchromatism, pleomorphisim and mitosis)
- Divided into:
    1. **Tubular adenoma:** less than 25% villous architecture.
    2. **Villous adenoma:** villous architecture over 50%.
    3. **Tubulovillous adenoma:** villous architecture between 25 and 50%.

REMEMBER:

- Any neoplastic mass lesion in the GIT may produce a mucosal protrosion, or polyp.
- The most common and clinically important neoplastic polyps are colonic adenomas, benign polyps that give rise to a majority of colorectal adenocarcenomas.
- Most adenomas, however, do not progress to adenocarcenoma.

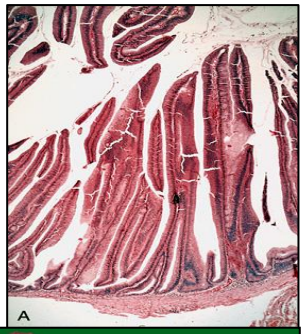


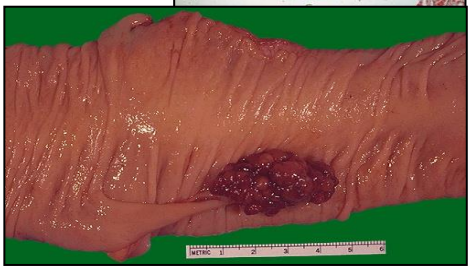
1- Tubular adenoma

- Most common.
- Represents 75% of all neoplastic polyps.
- 75 % occur in the distal colon and rectum.
- Small, Pedunculated with smooth surface, only few villi (Image).

2- Villous Adenoma

- The least common, largest and most ominous of epithelial polyps.
- Age: 60 to 65 years,
- 75% located in rectosigmoid area.
- Present with rectal bleeding or anaemia, large ones may secrete copious amounts of mucoid material rich in protein. Result in hypoproteinemia (Hypoalbuminemia), Hypokalemia and osmotic diarrhea.
- Sessile with multiple villi (Image A).





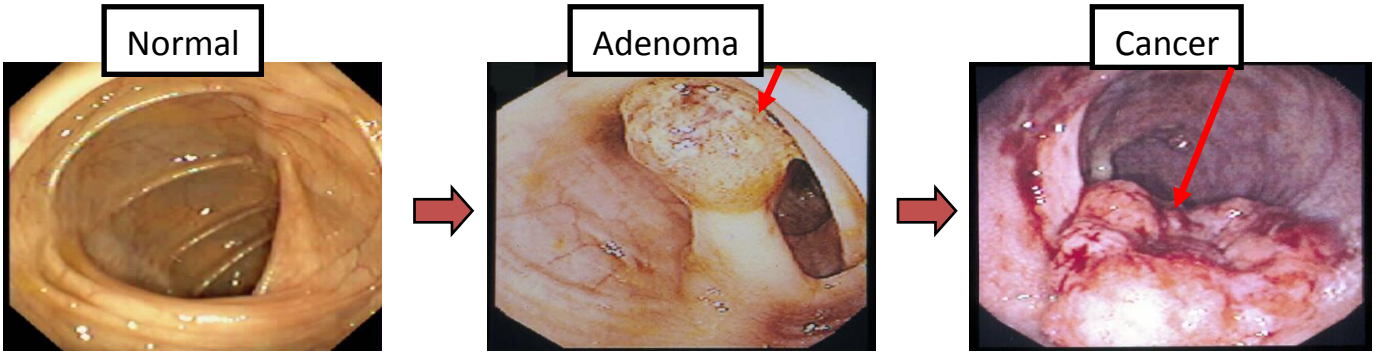
3- Tubulovillous adenoma

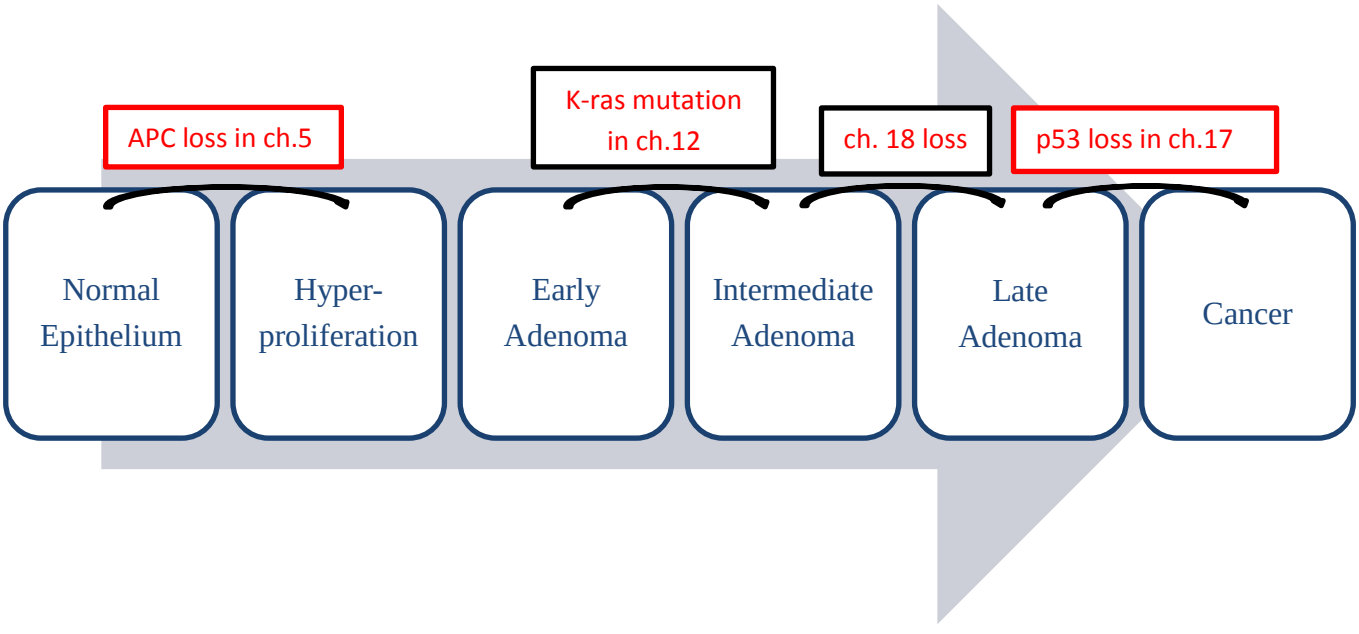
- Intermediate in size, degree of dysplasia and malignant potential between tubular and villous adenomas.

Relationship of Neoplastic Polyps to Carcinoma

- Adenoma to carcinoma sequence is documented by several genetic alterations.
- The probability of carcinoma occurring in a neoplastic polyp is related to:
  1. The size of the polyp.
  2. The relative proportion of its villous features.
  3. The presence of significant cytologic atypia (dysplasia) in the neoplastic cells.

Adenoma to Carcinoma Pathway





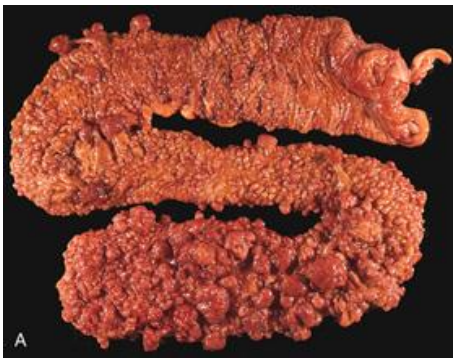
REMEMBER:

- Polyp removal leads to CRC (Colorectal cancer) prevention.
- Polyp is surrogate marker (Predict the clinical outcomes. You have to know that the progression of surrogate marker should precede clinical symptoms).

Familial Polyposis Syndrome

Patients have genetic tendencies to develop neoplastic polyps.

1- Familial polyposis coli (FPC)



- Genetic defect of Adenomatous polyposis coli (*APC*).
- *APC* gene located on the long arm of chromosome 5 (5q21).
- *APC* gene is a tumor suppressor gene.
- Innumerable neoplastic polyps in the colon (500 to 2500).
- Polyps are also found elsewhere in alimentary tract.
- The risk of colorectal cancer is 100% by midlife.
- Tx and prevention by: Colectomy.

2- Gardener's syndrome

- Polyposis coli, multiple osteomas (bone mass), epidermal cysts (skin lesions), and fibromatosis (soft tissue tumours).

3- Turcot syndrome

- Polyposis coli, glioma and fibromatosis.

Malignant Tumors of **Large** Intestine

1- Adenocarcinoma

- Adenocarcinoma of the colon is the most common malignancy of the GI tract and is a major cause of morbidity and mortality worldwide.
- Constitutes 98% of all cancers in the large intestine.

Predisposing factors:

1- IBD, adenomas, polyposis syndrome.

2- Diet appears to play an important role in the risk for colon cancer:

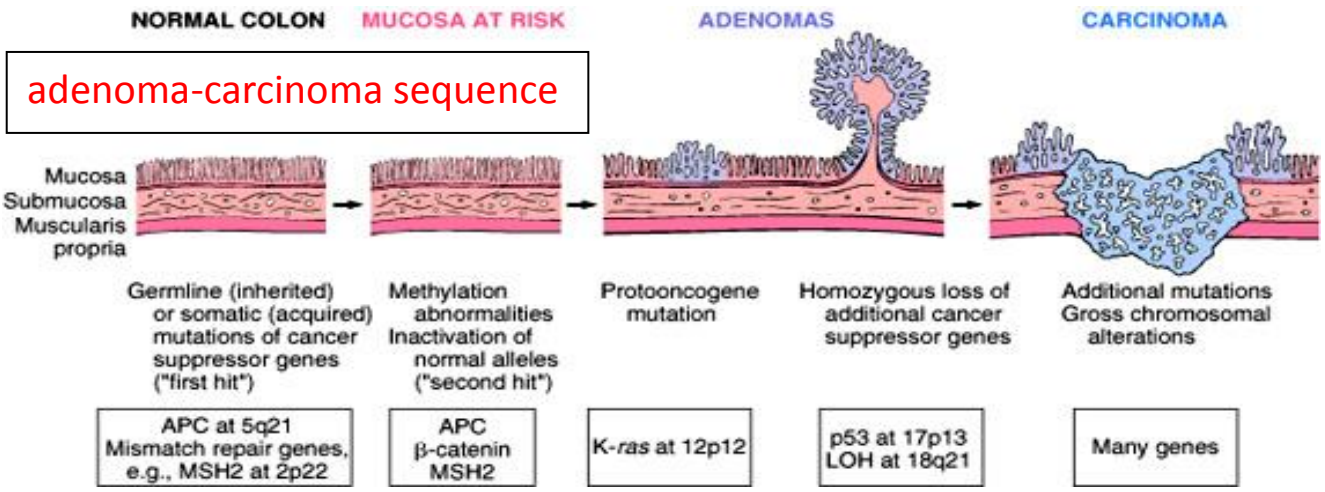
- Low fibre diet.
- High fat content.
- Alcohol.
- Reduced intake of vit A, C & E.

Carcinogenesis

Two pathogenetically distinct pathways for the development of colon cancer both seem to result from accumulation of multiple mutations:

1- The APC/B-catenin pathway (85%):

Chromosomal instability that results in: stepwise accumulation of mutations in a series of oncogenes and tumour suppressor genes.



REMEMBER:
APC ⟶ Early p53 ⟶ Late

2- The DNA mismatch repair genes pathway:

- 10% to 15% of sporadic cases.
- There is accumulation of mutations (as in the APC/B-catenin schema)
- Five DNA mismatch repair genes (MSH2, MSH6, MLH1, PMS1, AND PMS2) give rise to the hereditary non polyposis colon carcinoma (HNPCC)

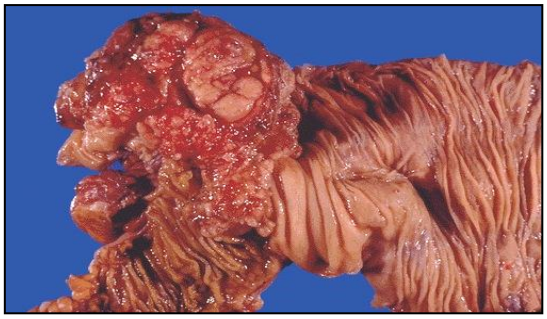
NOTE: Hereditary mutation of the *APC* gene is the cause of familial adenomatous polyposis (FAP), where affected individuals carry an almost 100% risk of developing colon cancer by age 40 years.

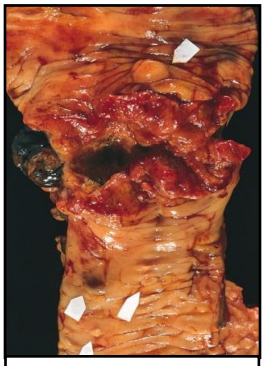
2- Colorectal Carcinoma

Morphology

- 70% are in the rectum, rectosigmoid and sigmoid colon.
- Left-sided carcinomas tend to be annular, encircling lesions with early symptoms of obstruction.
- Right-sided carcinomas tend to grow as polypoid, fungating masses, obstruction is uncommon.
- Mucinous adenocarcinoma secret abundant mucin that may dissect through cleavage planes in the wall.


Right-sided



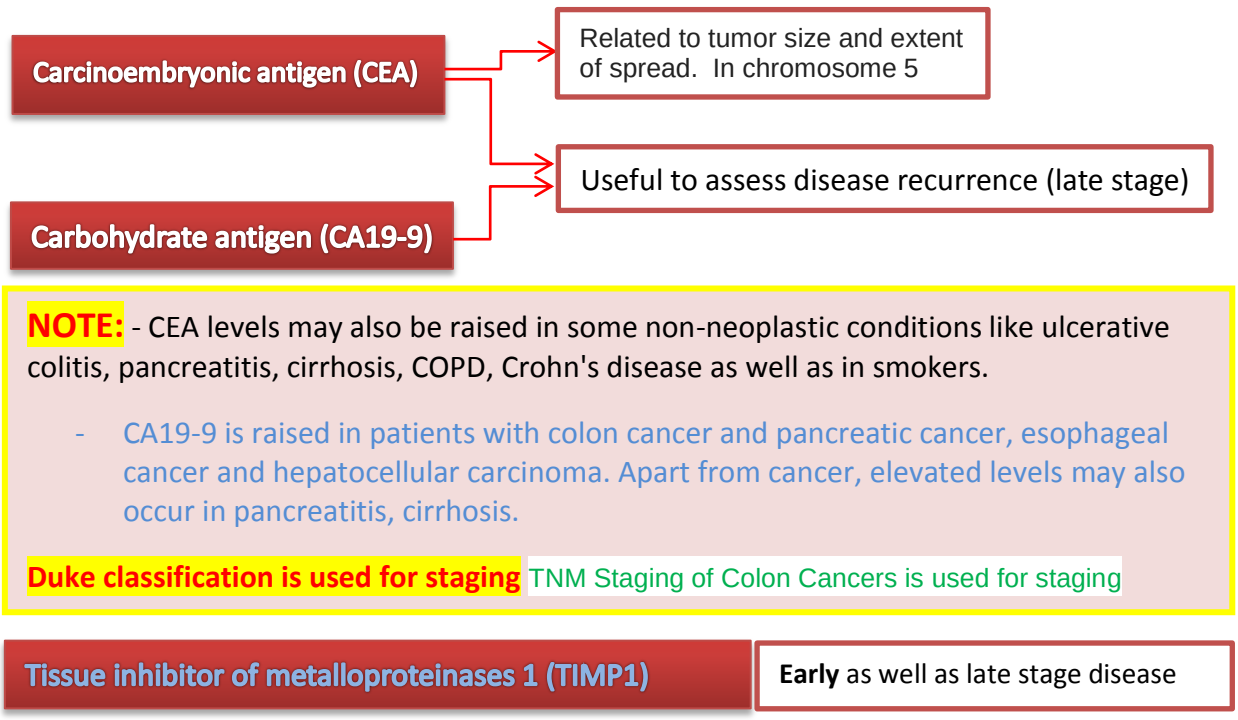

Left-sided

Signs and symptoms

- If located closer to the anus: change in bowel habit, feeling of incomplete defecation, PR bleeding
- A tumor that is large enough to fill the entire lumen of the bowel may cause bowel obstruction
- Left -sided lesions are more likely to obstruct lumen and/or bleed.
- While Right-sided tumors are usually detected later. Associated with anemia.
- The patient doesn't know that he is bleeding (see the anatomy of the colon).

Tumor markers

A **tumor marker** is a substance found in the blood, urine or body tissues that can be elevated in cancer, among other tissue types.

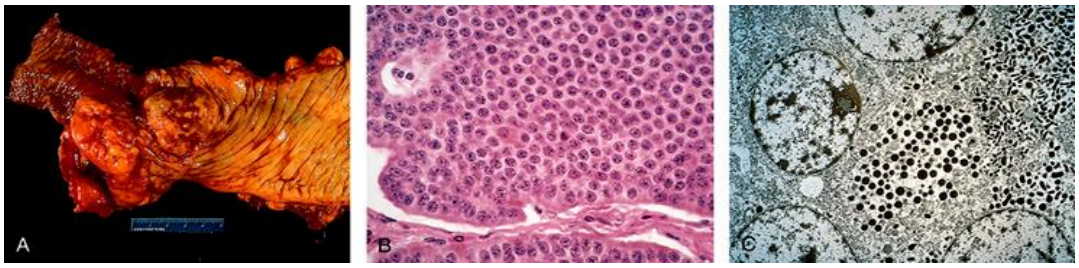


Malignant **Small** Intestinal Neoplasms

In descending order of frequency:
Carcinoid, adenocarcinomas, lymphomas and leiomyosarcomas.

1-Carcinoid Tumors

- Neoplasms arising from endocrine cells found along the length of GIT mucosa.
- 60 to 80% appendix and terminal ileum: 10 - 20% rectum.
- Ultrastructral features: neurosecretory electron dense bodies in the cytoplasm.



The cells are monotonously similar, having a scant, pink granular cytoplasm and a round-to-oval stippled nucleus.

Clinical features:

- Asymptomatic
- May cause obstruction, intussusception or bleeding.
- May elaborate hormones: Zollinger-Ellison, Cushing's carcinoid or other syndromes.

Carcinoid syndrome

- 1% of carcinoid tumor & in 20% of those of widespread metastasis.
- Paroxymal flushing, episodes of asthma-like wheezing, right-sided heart failure, attacks of watery diarrhea, abdominal pain.
- The principal chemical mediator is serotonin.
- The syndrome is classically associated with ileal carcinoids with hepatic metastases.

2-Lymphoma

- Most often low-grade lymphomas arising in mucosal-associated lymphoid tissue (MALT) lymphoma or high-grade non-Hodgkin's lymphomas of B cell type.
- May occur in any part of the intestine;
- The ileocecal region is a favored site for Burkitt's lymphoma.

Summary From Robbins:

Colonic Polyps, Adenomas, and Adenocarcinomas:

- Intestinal Polyps can be classified as non-neoplastic or neo-plastic. The non-neoplastic polyps can be further defined as inflammatory, hamartomatous, or hyperplastic.
- Inflammatory Polyps form as a result of chronic cycles of injury and healing.
- Hamartomatous Polyps occur sporadically or as a part of genetic diseases. In the latter case, they often are associated with increased risk of malignancy.
- Hyperplastic Polyps are benign epithelial proliferations most commonly found in the left colon and rectum. They are not reactive in origin, in contrast with gastric hyperplastic polyps; have no malignant potential; and must be distinguished from sessile serrated adenomas.
- Benign epithelial neoplastic polyps of the intestines are termed adenomas. The hallmark feature of these lesions, which are the precursors of colonic adenocarcinomas, is cytologic dysplasia.
- In contrast with traditional adenomas, sessile serrated adenomas lack cytologic dysplasia and share morphologic features with hyperplastic polyps.
- Familial adenomatous polyposis (FAP) and hereditary non-polyposis colorectal cancer (HNPCC) are the most common forms of familial colon cancer. (FAP) is caused by APC mutations, and patients typically have over 100 adenomas and develop colon cancer before age 30.
- HNPCC is caused by mutations in DNA mismatch repair genes. Patients with HNPCC have far fewer polyps and develop cancer at an older age than that typical for patients with FAP but at younger age than in patients with sporadic colon cancer.
- FAP and HNPCC are examples of two distinct pathways of neoplastic transformation, both of which contribute to sporadic colon cancer.
- The vast majority of colonic cancers are adenocarcinomas. The two most important prognostic factors are depth of invasion and the presence or absence of lymph node metastases.

Questions

1/ A 45-year-old woman presents with sudden attacks of wheezing, shortness of breath, and episodic hot flashes. She also reports abdominal cramps and diarrhea. Physical examination shows facial redness, pitting edema of the lower legs, and a murmur of tricuspid regurgitation. Which of the following is the most likely diagnosis?

(A) Carcinoid tumor
(B) Mediterranean intestinal lymphoma
(C) Mucosa-associated lymphoid tissue (MALT) lymphoma
(D) Peutz-Jeghers syndrome

2/ A 59-year-old man complains of progressive weakness. His friends have noticed that he has become pale, and he reports that his stools are tinged with blood. On abdominal palpation, there is fullness in the right lower quadrant. Laboratory studies show iron-deficiency anemia, Stool specimens are positive for occult blood. Colonoscopy reveals an elevated and centrally ulcerated lesion of the sigmoid colon. Which of the following is the most likely diagnosis?

(A) Adenocarcinoma
(B) Carcinoid tumor
(C) Gastrointestinal stromal tumor
(D) Lymphoma

3/ A gastroenterologist performs a colonoscopy on a patient with family history of gastric and colon cancer and discovers multiple polyps. Biopsy of one lesion reveals a benign hamartoma. On physical examination the patient is noted to have dark pigmentation of the buccal mucosa and lips. What is the most likely diagnosis?

(A) Adenomatous polyposis coli
(B) Gardner syndrome
(C) Peuts-Jeghers (PJ) syndrome
(D) Turcot syndrome

Answers:

- 1- A
- 2- A
- 3- C

اللهم إني استودعك ما قرأت و ما حفظت و ما تعلمت فرده عليَ عند حاجتي إليه انك على كل شيء قدير

If there is any mistake or feedback please contact us: 432PathologyTeam@gmail.com

432 Pathology Team
*Good Luck ^_^*