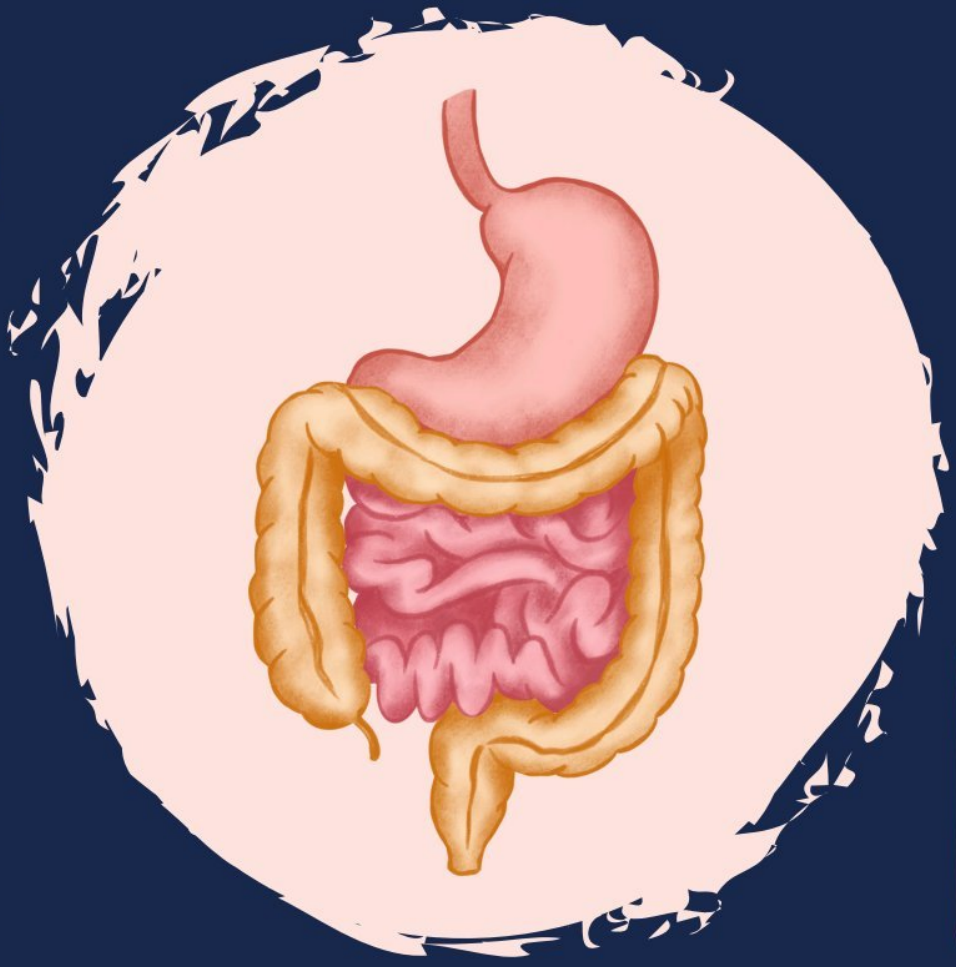
Level (3) - Semester (5)

PATHOLOGY



SCAN ME

GIT - Lecture (4)

GIT Tumors

DR M. YUSUF

GIT TUMORS

TUMORS OF ESOPHAGUS

Benign	1) **Squamous cell papilloma** 2) **Benign mesenchymal tumors as** (Leiomyoma – lipoma)
Malignant	1) **Carcinoma** 2) **Lymphoma** 3) **Sarcoma**

CARCINOMA OF THE ESOPHAGUS

PATIENT CHARACTERISTICS

① **Age:** above 40 years

② **Sex:** More common Males

PREDISPOSING FACTORS

③ **Genetic susceptibility**

④ **Diet (**Hot spicy food – Nitrites – Deficiency of vitamin A,B,C**).**

⑤ **Precancerous lesions (**Achalasia – Diverticulae – Barrett's oesophagus**)**

SITE

50% middle 1/3 then lower 1/3 then upper 1/3.

MORPHOLOGY

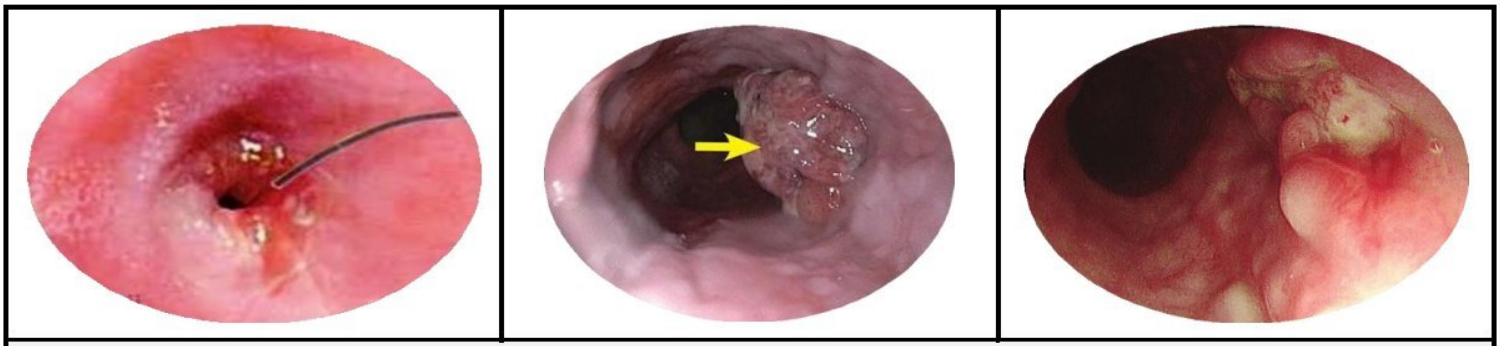
N/E	▪ Polypoid fungating mass ▪ Ulcerating ▪ Infiltrating leading to stricture
M/E	▪ Squamous cell carcinoma (**90%**) ▪ Adenocarcinoma on top of Barrett's esophagus ▪ Small cell undifferentiated carcinoma

Spread

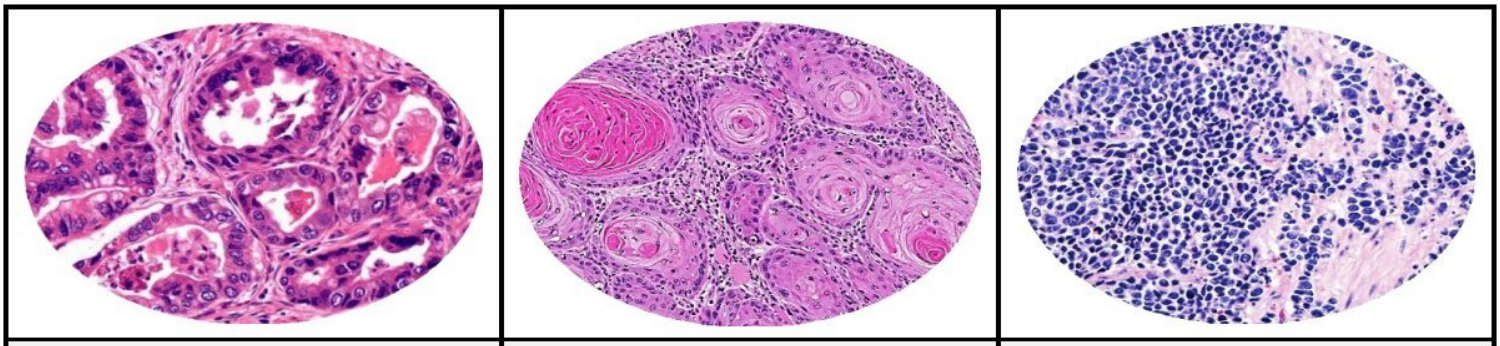
① **Local:** Trachea - Mediastinal structures
② **Lymphatic:** Supraclavicular - Mediastinal & Coeliac lymph nodes
③ **Blood:** Lung - Liver - ect…

Effects

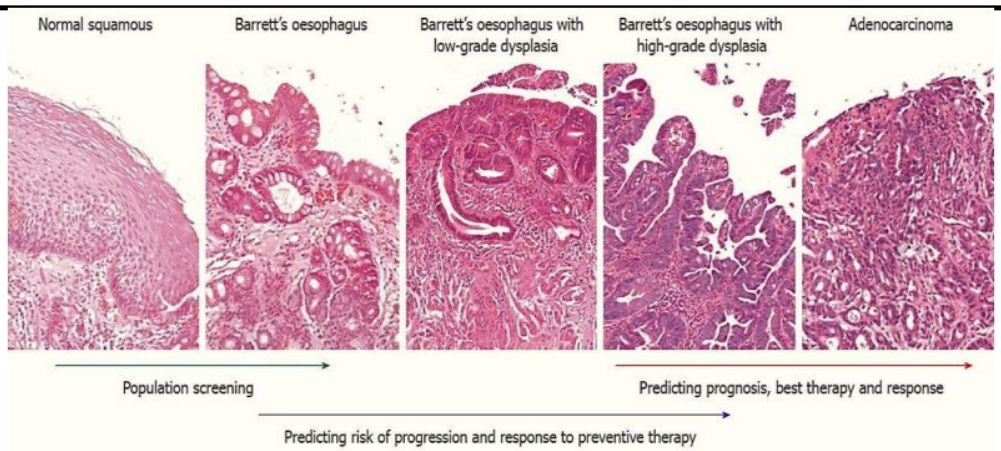
① **Obstruction**
② **Haematemesis**
③ **Tracheo-Oesophageal fistula**
④ **Parathrmone production with hypercalcaemia (Paraneoplastic)**



Esophageal carcinoma (NE)



Esophageal squamous cell carcinoma	Esophageal adenocarcinoma	Small cell undifferentiated carcinoma of the esophagus



Barrett's esophagitis to adenocarcinoma progression

TUMORS OF STOMACH

Benign	1) **Gastric adenoma** (adenomatous polyps) 2) **Benign mesenchymal tumors as** (Leiomyoma – lipoma)
Malignant	1) **Gastric carcinoma** 2) **Carcinoid tumour** 3) **Gastrointestinal stromal tumor** 4) **Lymphoma**

Gastric Carcinoma

Patient Characteristics

- **Age:** Over 50 years
- **Sex:** More common in male

Risk Factors

① Genetic

② Environmental

a) Diet:

- Decreased (protein – vegetables – fruits)
- Increased complex carbohydrates.
- Smoked food (sushi) & Nitrits (processed meat)

b) Irradiation

③ Precancerous lesions:

a) Adenomatous polyps (gastric adenoma)
b) Chronic gastritis associated with intestinal metaplasia & dysplasia
c) Gastric peptic ulcer
d) Helicobacter infection

Site

- **Commonest site:** pyloric antrum
- Can occur **anywhere** in the **stomach**

Gross Morphology (N/E)

① **Fungating type**

② **Ulcerating type**

③ **Infiltrating type:**

- Localized infiltrating: Leading to Stricture
- Diffuse infiltrating: affects the whole stomach → small – rigid - thick-walled stomach with narrow lumen (Linitis plastica, leather bottle stomach)

Microscopic Morphology (M/P)

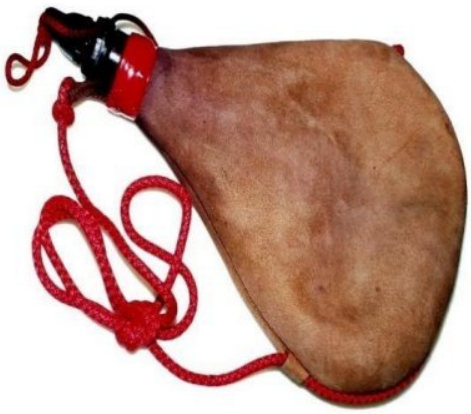
① **Adenocarcinoma**
② **Mucoid adenocarcinoma**
③ **Signet ring carcinoma**
④ **Anaplastic**

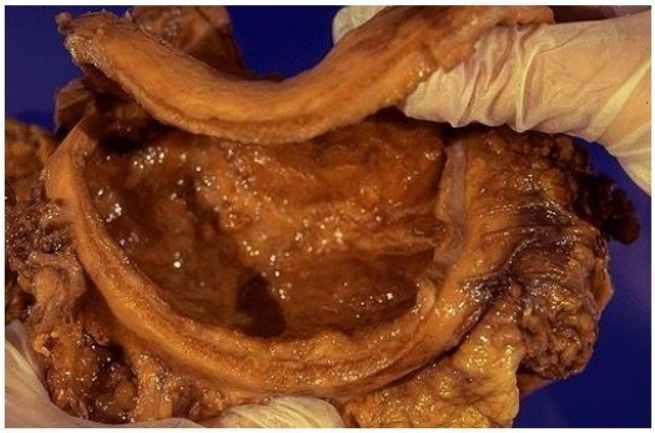
Spread of Gastric Carcinoma

Local	1) Stomach wall 2) Esophagus 3) Pancreas 4) Colon 5) Liver 6) Omentum
Lymphatic	▪ Gastric, Caeliac, Para aortic & Left Supra clavicular lymph nodes
Blood	1) Liver 2) Lungs 3) Bone
Transcoelomic	1) Peritoneal nodules 2) Hemorrhagic ascites 3) Krukenberg tumor (bilateral ovarian metastasis)

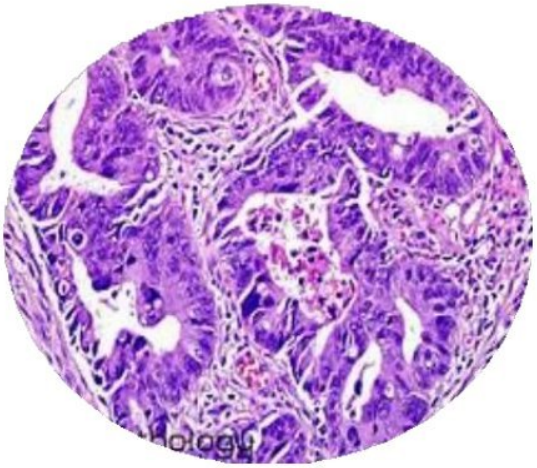
Complications

① **Haematemesis & melena**
② **Iron deficiency anaemia**
③ **Hypochlorhydria due to mucosal destruction**
④ **Pyloric obstruction**
⑤ **Cachexia**

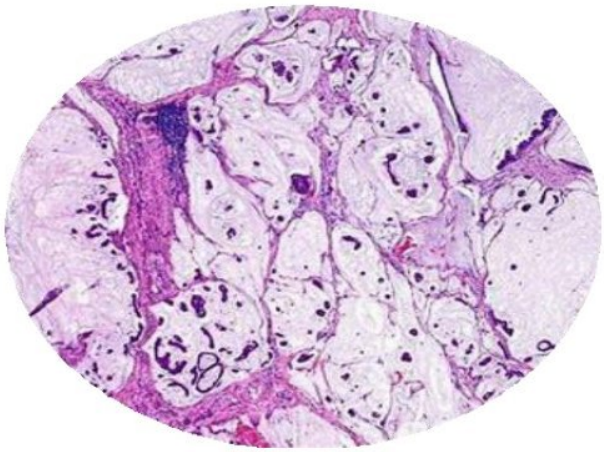




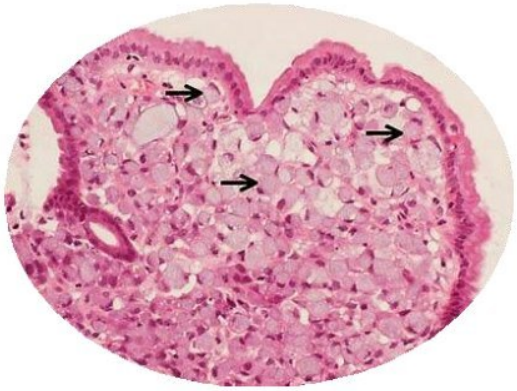
Gastric carcinoma (linitis plastica)



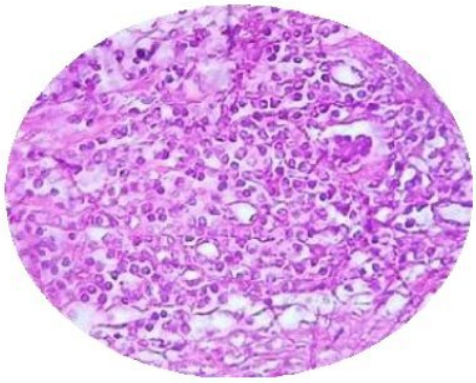
Adenocarcinoma of stomach



Mucoid adenocarcinoma of stomach



Signet ring carcinoma of stomach



Anaplastic carcinoma of stomach

TUMORS OF SMALL INTESTINE

Benign	1) **Adenomatous polyps (adenoma)** 2) **Benign mesenchymal tumors as** (Leiomyoma – lipoma)
Malignant	1) **Carcinoid tumour** 2) **Adenocarcinoma of the ampula of vater** 3) **Sarcomas** 4) **Lymphoma**

CARCINOID TUMOR

ORIGIN

- Arises from **Argentaffin cells** (APUD) of gastrointestinal mucosa.

BEHAVIOR

- **Locally malignant or malignant.**

SITE

① Appendix & Terminal ileum (Most common site)
② Rectum & sigmoid: Less common
③ Esophagus & stomach: Rare.

GROSS MORPHOLOGY (N/E)

- **Submucosal nodule which is:**

Color	Yellowish
Consistency	Firm
Fate	May obstruct the lumen or ulcerate

MICROSCOPIC MORPHOLOGY (M/P)

- **Solid sheets of cells:**

Size	Small
Shape	Uniform & Polyhedral
Nuclei	Deeply Stained

- **The peripheral cells:** Show pallisaded appearance separated by delicate vascular stroma.

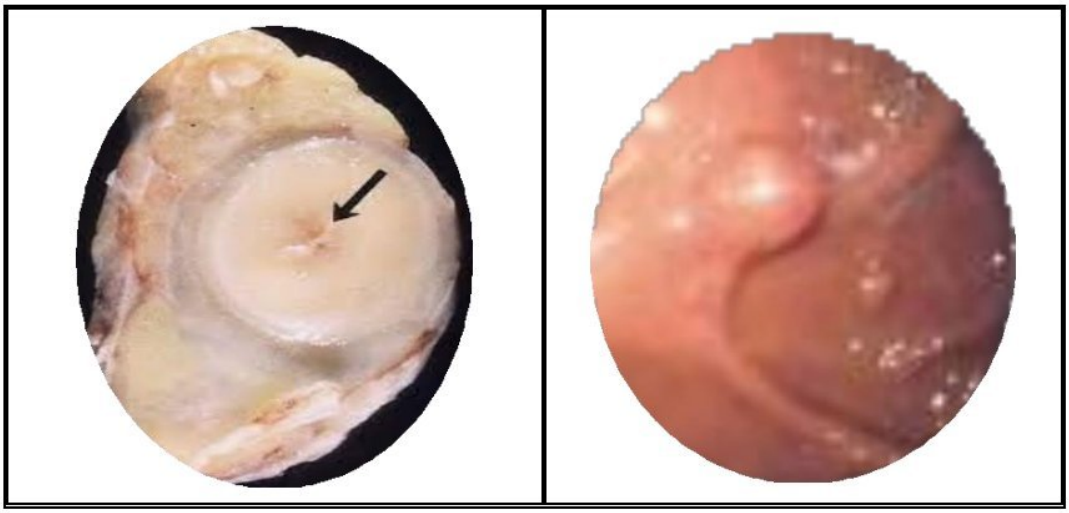
Complications

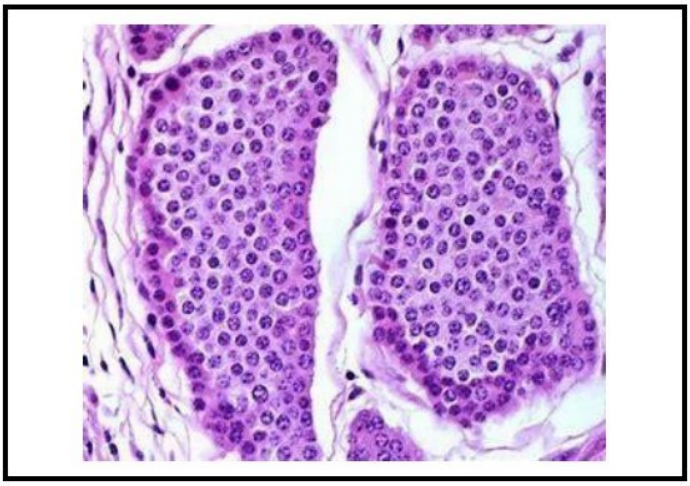
① **Partial intestinal obstruction**
② **Hepatomegaly:** Due to metastasis
③ **Carcinoid syndrome:** Occurs only when there is liver & lung metastasis

Bioactive Products

Produced by the tumour & **Inactivated in the liver & lung**

❶ **Serotonin**	1) **Hypertrophy of intestinal muscle** → Obstruction 2) **Increase intestinal motility** → Diarrhea 3) **Stimulate fibroblastic proliferation in right side of heart** → Tricuspid & Pulmonary valve stenosis
❷ **Histamine**	1) **Bronchospasm** (asthmatic attacks) 2) **Flushing of face** 3) **Edema**





TUMORS OF LARGE INTESTINE

Benign	1) **Adenomas** 2) **Connective tissue tumors:** leiomyoma – fibroma – neurofibroma.
Malignant	1) **Adenocarcinoma** 2) **Carcinoid tumour** 3) **Sarcomas** 4) **Malignant Lymphoma**

1 POLYPS OF LARGE INTESTINE

Definition

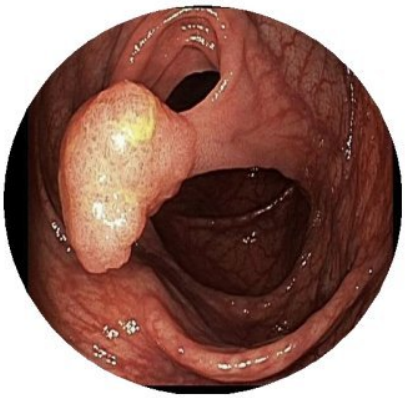
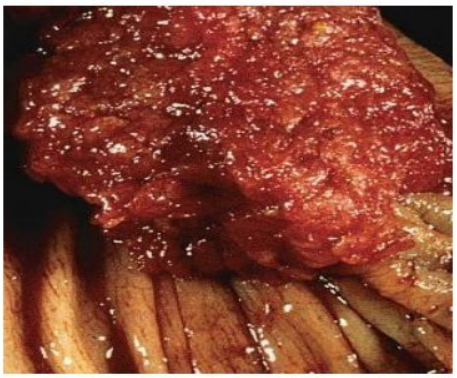
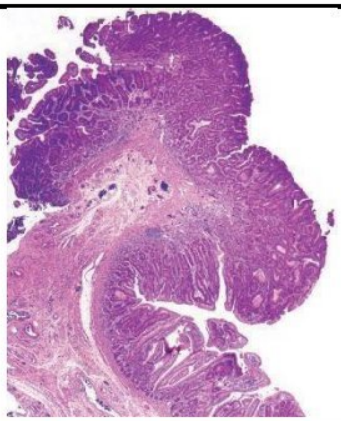
- **A polyp is any growth projecting from mucus membrane.**

TYPES

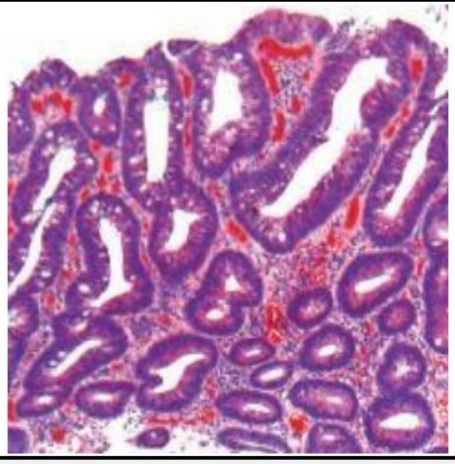
1	**Inflammatory polyps**	1) **Bilharzial** 2) **Lymphoid**
2	**Hamartomatous polyps**	▪ **Masses** of **normal tissue** elements growing in a **disordered** & **unorganized manner**
3	**Hyperplastic polyps**	▪ **Epithelial proliferations** with excess **mucin production** ▪ **Do not have malignant potential**
4	**Adenomatous polyps**	▪ **Benign** colonic **epithelial** neoplasms ▪ **Have the potential** for **malignant transformation**

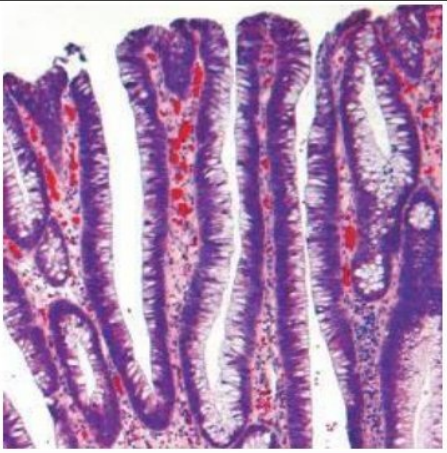
MICROSCOPIC EXAM

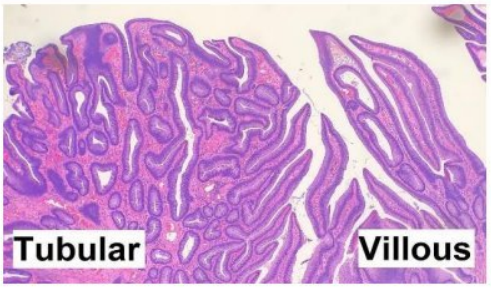
N/E	▪ **Shape:** Finger-like projection ▪ **Diameter:** Range from mm to 10 cm ▪ Can be **pedunculated** or **sessile**
M/E	**Polyp= fibrovascular core covered by epithelium** ▪ **The epithelium:** Columnar forming glands. ▪ **The glandular architecture is used to classify adenomas into:** Tubular – villous – tubulovillous types ▪ **Epithelial dysplasia:** Characterized by (nuclear hyperchromasia – elongation – stratification)

Adenomatous polyp of colon


Tubular adenoma

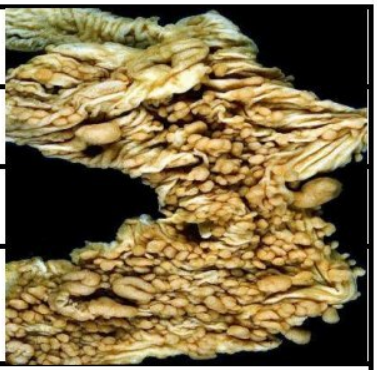

Villous adenoma



Tubulovillous adenoma

II FAMILIAL ADENOMATOUS POLYPOSIS COLI (FAP, APC)

Definition	▪ **Autosomal dominant** hereditary disease
Age	▪ Average onset is **25** years old
Site	▪ **Adenomatous** polyps, mostly **colorectal**
Diagnosis	▪ Patients, on average, have **~1000** polyps. ▪ **Minimum of 100 polyps** are necessary for **diagnosis**.
Genetic defect	▪ **On chromosome 5q21, APC** (Adenomatous Polyposis Coli) tumor **suppressor** gene.
Behavior	▪ **Precancerous:** virtually **100%** **will develop cancer** within **10 to 15 years** if not treated.
Treatment	▪ By **prophylactic colectomy.**



Colorectal Carcinoma

Incidence

- **Age:** 60 to 70 years
- **Represesnt 95%** of colonic malignancy

Risk Factors

① **Genetic influences:**

- Familial adenomatous polyposis coli syndrome; Several mutations to different genes: APC - k-ras - p53.

② **Precancerous lesion:**

- As ulcerative colitis & adenomatous polyp

③ **Dietary practices:**

- Decreased intake of protective micronutrients (vitamins A, C, & E)
- Low content of unabsorbable vegetable fiber
- Corresponding high content of refined carbohydrates
- High fat, protien content causing ↑↑ cholesterol

Pathogenesis pathways

① **The classic adenoma-carcinoma sequence (80%):**

- Starts with APC gene, for adenoma to develop, both copies have to be inactive; one may be absent in the germ line or aquired mutation → This will lead to cell proliferation.
- Proliferating cells are instable acquire additional gene mutations as KRAS, P53,... → lead to progression to adenocarcinoma

② **The mismatch repair(microsatellite) pathway:**

- Mismatch repair is the process that detects, excises & repairs errors that may occur during DNA replication.
- Defects in the repair process result in high rates of mutation

Site

- **Any site, Common in Sigmoid & rectum**

Microscopic Exam

N/E	1) **Fungating type** 2) **Ulcerating type** 3) **Infiltrating annular type** leading to stricture
M/E	1) **Adenocarcinoma** 2) **Mucoid adenocarcinoma.** 3) **Signet ring carcinoma** 4) **Anaplastic**

Spread

① **Local spread:** Colon wall – Liver – etc…

② **Lymphatic spread:** Mesentric lymph nodes
Initially involves the lymph nodes immediately underlying the tumor.

③ **Blood Spread:** Liver - Lungs - Bone
Venous invasion leads to blood-borne metastases, which involve the liver in most patients

④ **Transcoelomic spread:** Peritoneal nodules - Hemorrhagic ascites - Krukenberg tumor (bilateral ovarian metastasis)
In such case, there may be multiple peritoneal deposits throughout the abdomen

Complications

① **Bleeding per rectum**
② **Iron defiency anaemia**
③ **Colonic obstruction**
④ **Cachexia**

Staging

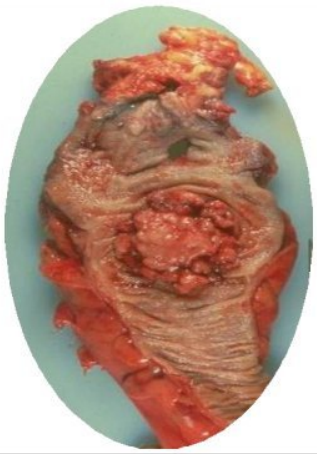
- **Reflects degree of spread,** for an individual cancer patient
- **Assigned at:** Time of diagnosis & May be updated as patient progresses
- **Depend upon:**
  1) Depth of tumor infiltration of the wall
  2) Lymph node metastases
  3) Distant metastases
- **Two staging system:**
  1) Duke's & Astler Collar modified Duke's
  2) TNM

① DUKE'S & ASTLER COLLAR

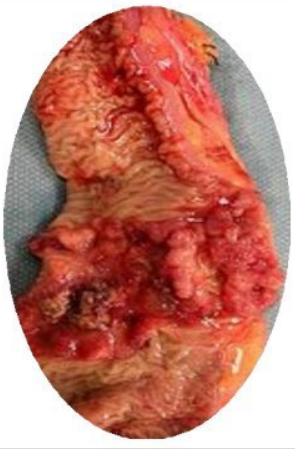
Stage	Invasion of Colonic Wall	Lymph Node Metastases	Distant Metastases	5-Year Survival rate
A	Mucosa & submucosa	No	No	> 90%
B1	Partial muscle wall thickness	No	No	67%
B2	Full thickness of muscle wall	No	No	55%
C1	Partial muscle wall thickmess	Yes	No	40%
C2	Full thickness of muscle wall	Yes	No	20%
D	Any	Yes or No	Yes	<10%

② TNM STAGING

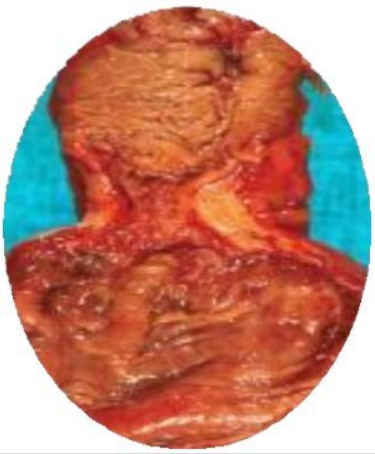
T= Primary tumor	
T1	Submucosa
T2	Muscularis propria
T3	Subserosa
T4	Perforates the visceral peritoneum, directly invades organs
N= Lymph nodes	
N1	1 -3 pericolic lymph nodes
N2	4 or more pericolic lymph nodes
M= Metastasis	
M1	Distant metastasis



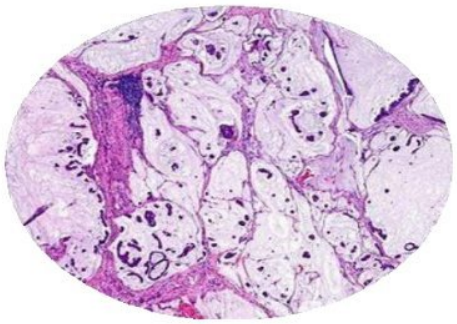
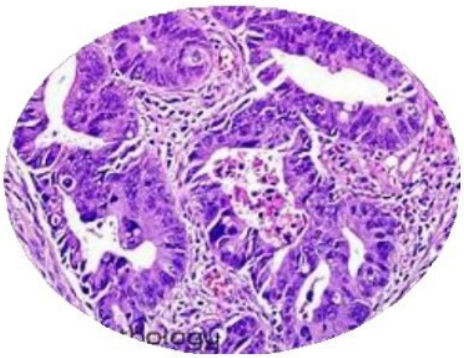
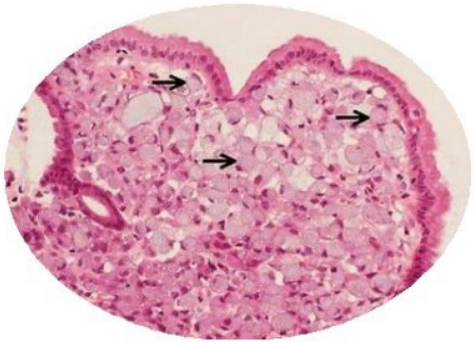
Colorectal carcinoma (fungating)

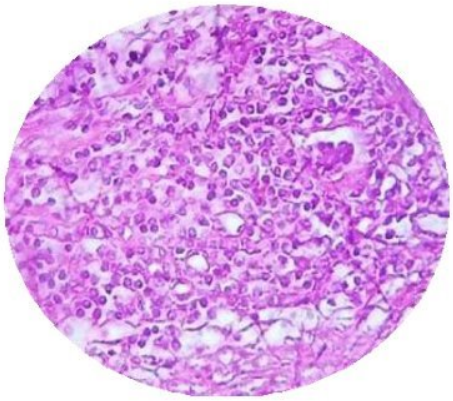
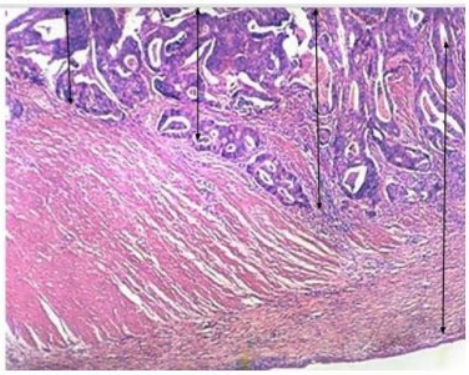
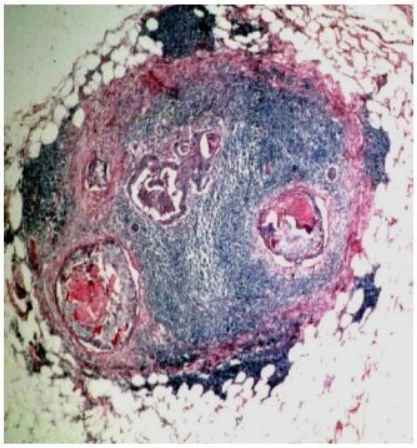


Colorectal carcinoma (ulcerating)



Colorectal carcinoma (Infiltrating)

		
Mucoid adenocarcinoma	Adenocarcinoma	Signet ring carcinoma

		
Anaplastic carcinoma	Staging of colorectal adenocarcinoma	lymph node metastasis