**Gross**

- *Large (> 6 cm)*
- *Apparently circumscribed* (lacks well-defined capsule)
- *Cross section shows pale, small, grey-white mucinous cysts*

**Microscopy**

- *Combo of...*
  - a) *mucus-secreting* cells
  - b) *epidermoid/squamous-like* cells
  - c) *clear/intermediate* cells

- *Small epithelial* cells (in islands)
- *Micro-cystic change* (solid appearance with infiltrative growth)

**Clinical Behavior**

- *Infiltrating*

- *Small, poorly encapsulated, infiltrative, grey-pink lesions*

- *Slow-growing, aggressive* tumors
- *Recurrent, painful* (due to perineural invasion)

---

**SUB-PART CF 01 (C): NON-EPIHELIAL TUMORS**

3. Types:
   - a) *Hemangiomas, lipomas, lymphangiomas* (all are of mesenchymal origin)
   - b) *Sarcomas*
   - c) *Lymphomas* (NHL)
PART CF 03: ORAL CANCERS

SUB-PART CF 03 (A): LEUCOPLAKIA

1. Definition:
   a) (Descriptive clinical term for an) asymptomatic white patch/plaque on mucosal surface
   b) Cannot be clinically/pathologically characterized as any other disease
   c) NOT associated with any chemical/physical causative agents

2. Etiology:
   a) Smoking
   b) Spirits
   c) Spices
   d) Sepsis (due to poor oral hygiene)
   e) Sharp edge of tooth

3. Morphology (microscopy): hyperkeratosis, hyperplasia, dysplasia

   *Dysplasia may or may not be present. If present, squamous cell Ca may develop*

4. Clinical significance: 5% risk of malignancy

SUB-PART CF 03 (B): ORAL CANCER PROPER

5. Common sites: lips, tongue
PART CF 05: GERD

1. Is a reflux esophagitis (due to LES relaxation)

2. Symptoms: heartburn, bloating
17. Pathogenesis:

**Chronic inflammatory** (Th2) response

- Acquired MALT
- Monoclonal proliferation of B cells
- Gastric B cell, low grade NHL

(Rarely becomes) high grade large cell NHL (β cell lineage) due to genetic change

18. Prognosis is better than adenoCa

... 
B cells 
Since MALT is a normal finding in other parts of GIT, prognosis (of gastric lymphoma) ain’t that bad 😊

**LIMB-phoma:**

Lymphoma (NHL)
Inflammation (chronic; Th2)
MALT (acquired)
B cells

Since MALT is a normal finding in other parts of GIT, prognosis (of gastric lymphoma) ain’t that bad 😊
**Microscopy**

- *Ulceration*
- *Non-caseating granulomas*

*Neuromatoid hyperplasia & lymphangiectasia*
*Other mural changes (e.g. fibrosis, thickening)*

**Clinical features**

- *Mild diarrhea, pain, fever* (with asymptomatic intervals)
- *Flared by emotional stress*
- *Extra-intestinal* manifestations (e.g. migratory polyarthritis, sacrolitis, ankylosing spondylitis)

*Attacks of bloody, mucoid diarrhea* (with asymptomatic intervals)
*Flare-ups due to emotional stress*
*Most feared complication: progression to adenocarcinoma*
*Extra-intestinal manifestations more common*

**Complications**

<table>
<thead>
<tr>
<th>Complication</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malabsorption syndrome</td>
<td>Often iatrogenic</td>
</tr>
<tr>
<td>Fistula formation</td>
<td>Can cause malabsorption if bowel loops are bypassed</td>
</tr>
</tbody>
</table>
| Anal lesions         | *Skin tag*  
                       | *Fissures*  
                       | *Fistula* |
| Blood loss           | *Acute/chronic*  
                       | *Leads to anemia* |
| Electrolyte disturbance | Due to severe diarrhea in acute phase |
| Toxic dilation       | When ulcer involves muscle coat |
| Colorectal Ca        | Incidence: 2% |

*Systemic:
### Turcot’s syndrome
- *FAP + CNS tumors*
- *↑ risk of colon adenoCa*

### Peutz Jegher syndrome
- *Multiple hamartomatous (arborized) polyps* involving mucosa & muscularis over entire GIT
- *Melanotic mucosal pigmentation* in peri-oral area, face & genitalia
- *↑ risk of pancreas, ovary & lung Cas*

### Cowden syndrome
- *Multiple hamartomas* in all 3 germinal layers
- *Facial trichilemmomas, oral papillomas*

### HNPCC (hereditary non-polyposis colon cancer) @ Lynch syndrome
- *↑ risk of colon cancer & endometrial Ca*
- *Mutations in DNA repair gene → microsatellite instability*

---

5. **Adenoma-Ca syndrome:**

Transition of normal epithelium → adenoma/ Ca is associated with acquired molecular events, e.g.

<table>
<thead>
<tr>
<th>Event</th>
<th>Sub-event</th>
<th>Description</th>
</tr>
</thead>
</table>
| Oncogenes activation | *Ki-ras point mutation* | *GTP-ras is in persistent active state*  
*Results in unchecked cell division* |
|               | *c-myc overexpression* | *↑ DNA synthesis*  
*Results in ↑ cell proliferation* |
PART CF 17: ACUTE APPENDICITIS

1. Etiology:
   a) Fecolith (feces which block lumen of appendix)
   b) Ball of worms
   c) Carcinoid tumor
   d) Food residues
   e) Lymphoid hyperplasia

2. Pathogenesis:

3. Morphology:

<table>
<thead>
<tr>
<th>Gross</th>
<th>Microscopy</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Swollen, edematous</td>
<td>*Mucosal ulceration</td>
</tr>
<tr>
<td>appendix</td>
<td>*Suppuration/necrosis</td>
</tr>
<tr>
<td>*Fibrinopurulent exudate</td>
<td>*Neutrophils (in all layers)</td>
</tr>
<tr>
<td>*Dull-colored serosa</td>
<td>*Green-black (in gangrenous appendicitis)</td>
</tr>
</tbody>
</table>

*Obstruction
Continued secretion of mucinous fluid
Blockage of venous drainage
Infection → Ischemia → Gangrene
4. Clinical features & complications:

**Clinical Features**
- Young adults
- Periumbilical pain (migrates to right lower quadrant)
- Acute abdominal pain (at right iliac fossa)
- Nausea/vomiting
- Mild fever
- Leucocytosis
- McBurney’s sign (deep tenderness located 2/3 of distance from umbilicus → right ASIS)

**Complications**
- Perforation
- Peritonitis, abscess, fistula
- Septicemia
- Suppurative pyophlebitis (inflammation & thrombosis of portal vein)
- Liver abscess
- Mucocele
PART CF 18: COLORECTAL Ca

1. Epidemiology:
   a) 1 of the commonest forms of malignancies in developed countries
   b) High risk areas: Europe, America, Australia

2. Etiology:
   1. Environmental factors (esp. diet)
   2. Genetics
   3. Long-standing ulcerative colitis
   4. Adenomatous polyps

   Role of Diet
   1. Diet affects...
      a) bacterial flora of colon
      b) bowel transit time
      c) amount of AAs, bile acids, cellulose in bowel
   2. High content of fermentable cellulose in diet → ↑lvls of protective volatile FAs → provide nutrition & aid maturation of epithelial cells
   3. Low fibre → ↓volatile FAs & prolongs intestinal transit → ↑ time for bacterial action on contents → prolonged contact between any carcinogen generated with mucosa
   4. High fat → ↑bile salt production → ↑fecal bile acid load
   5. High protein → favors transformation of AAs by bacteria

*NSAIDs (e.g. aspirin) are protective against colorectal Ca)

3. Clinicopathology:
   1. ♂
   2. Age: 60 – 70
   3. Usually insidious/ asymptomatic until late stages
   4. Right-sided lesions (e.g. occult bleeding → Fe²⁺-deficiency anemia → fatigue, weakness, weight loss)
   5. Left-sided lesions (e.g. crampy lower abdominal pain, altered bowel habits)
   6. Bulky lesions
   7. Rectal lesions (e.g. bleeding)
   8. Metastasis (hematogenous/ lymphatic) to regional lymph nodes, liver, lung, bone
5. Classification (of chronic hepatitis) involves assessment of...

**Etiological type**

**Stage (degree of architecture disturbance)**

1. Histological aspects to be assessed:
   a) Normal architecture
   b) Fibrous enlargement of portal tracts
   c) Bridging fibrosis
   d) Cirrhosis

2. Clinical significance: ↑ disturbance → ↓ likelihood of it being reversible when inflammatory activity subsides

**Grade (severity of liver cell damage & inflammation)**

1. Aspects to be considered:
   a) Extent of interface hepatitis
   b) Degree of bridging necrosis
   c) Frequency of intralobular apoptotic hepatocytes
   d) Density of inflammatory infiltrate (in portal tracts)

2. Each feature is scored → total histological activity index is determined → numerical score translated into grades (minimal/ mild/ moderate/ severe hepatitis)

3. Clinical significance:
   a) ↑ severity → ↑ risk of progression to significant architectural disturbance (or eventually, cirrhosis)
   b) Management differs with grade
# PART CG 07: PORTAL HYPERTENSION

1. **Etiology:**

<table>
<thead>
<tr>
<th>Region</th>
<th>Etiology</th>
</tr>
</thead>
</table>
| 1         | **Pre-hepatic**  

- *Obstructive thrombosis*  
- *Portal vein narrowing* (before it enters liver)  
- *Massive splenomegaly* (with ↑ splenic vein blood flow)                                                                 |

| 2         | **Intra-hepatic**  

- *Cirrhosis* (most common)  
- *Schistosomiasis*  
- *Massive fatty change*  
- *Diffuse fibrosing granulomatous disease* (e.g. sarcoidosis)                                                                 |

| 3         | **Post-hepatic**  

- *Severe right heart failure*  
- *Constrictive pericarditis*  
- *Hepatic vein outflow obstruction* |
3. Clinical features & complications:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description &amp; Complications</th>
<th>Pathophysiology</th>
</tr>
</thead>
</table>
| Ascites              | *Accumulation of excessive fluid in peritoneal cavity  
*Usually caused by cirrhosis  
*Detectable when ≥ 500 mL of fluid have accumulated  
*Fluid is generally serous (low albumin)  
*Has equal conc of glucose, Na+, K+ as blood  
*May contain some mesothelial cells & mononuclears  
*Can lead to hydrothorax (due to seepage of peritoneal fluid) | *Sinusoidal hypertension & hypoalbuminemia (these alter Starling’s forces & drive fluid into space of Disse)  
*Seepage of hepatic lymph into peritoneal cavity (hepatic lymph flow ↑ during cirrhosis)  
*Splanchnic vasodilation & hyperdynamic circulation [see #2 above]                                                                                                                                                                                                                   |
| Portosystemic shunts| *Can give rise to...  
a) esophageal varices → hematemesis  
b) caput medusae                                                                                                                                                                                                                                                               | Up ↑ portal system pressure  
Angiogenesis & collateral vessels dilation  
Flow reversed from portal --> systemic circulation |                                                                                                                                                                                                                                                                                                                                                 |
| Splenomegaly         | May induce thrombocytopenia/pancytopenia                                                                                                                                                                                                                                               | Long-standing congestion                                                                                                                                                                                                                                                                                                                                                                               |
(Clockwise from top left:) Liver cell adenoma, hemangioma, bile duct hamartoma, (2) focal nodular hyperplasia

**SUB-PART CG 10 (B): MALIGNANT TUMORS**

**SUB-SUB-PART CG 10 (B 1): GENERAL**

2. **Classification:**

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1°     | • Hepatocellular Ca @ hepatoma  
        • CholangioCa  
        • Angiosarcoma  
        • Hepatoblastoma (in children) |
| 2°     | • (Metastases) |

**SUB-SUB-PART CG 10 (B 2): HEPATOCELLULAR Ca**

3. **Hepatocellular Ca:**
c) PGs

d) Severe illness

7. Contributory factors:

1. Dehydration/ multiple blood transfusions → pigment overload
2. Gall bladder stasis (seen in bedridden patients)
3. Accumulation of biliary sludge, mucous, bile & mucus → cystic duct obstruction
4. Bacteria, lysolecithins

8. Morphology:

<table>
<thead>
<tr>
<th>Gross</th>
<th>Microscopy</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Enlarged, tense</td>
<td>*Neutrophilic infiltrate (in mucosa &amp; submucosa)</td>
</tr>
<tr>
<td>*Bright red (due to hemorrhage)</td>
<td>*Edema, vascular congestion</td>
</tr>
</tbody>
</table>
9. Clinical features:
   a) (Surgical emergency)
   b) Right upper quadrant @ epigastia pain
   c) Fever, anorexia, sweating, nausea, vomiting, tachycardia
   d) Jaundice (due to obstruction)
   e) (Symptoms are insidious in acalculous cholecystitis)

10. Complications:
   1. Empyema (pus-filled)
   2. Gangrene
   3. Emphysematous cholecystitis (when there’s infection with gas-forming *Clostridium* & *coliform* organisms in acalculous type)
3. Pathogenesis:
   a) Main contributory factors:
      1. ↑ cholesterol (super-saturation)
      2. Hypomotility (of gall bladder)
      3. ↑ mucin secretion
   b) Pathogenesis proper:
4. Clinical features:

<table>
<thead>
<tr>
<th>Typical</th>
<th>Severe Cases</th>
<th>Emergency</th>
</tr>
</thead>
</table>

(Clockwise from top left): interstitial, hemorrhagic, necrotizing pancreatitis

**Microscopy**

- *Acute inflammation*
- *Microvascular leakage → edema*
- *Fat necrosis*
- *Vessels* destruction (& subsequent interstitial hemorrhage)

Red arrow: fat necrosis. Black arrow: parenchymal necrosis
## Coronary atherosclerosis

May involve the following branches:

a) **Left anterior descending**
b) **Left circumflex**
c) **Right coronary** artery

## Coronary thrombus

- Exposure of subendothelial **collagen** & **necrotic plaque contents**
- Platelet adhesion & aggregation
- Mediators released
  - Vasospasm, activation of (extrinsic pathway of) coagulation → thrombus

## Acute plaque change

- Disruption of (formerly) partially stenosed plaques → **Hemorrhage into atheroma**
- Erosion, **ulceration**
- Rupture/ fissuring

---

10. Location & site of infarct depend on...

   a) Site of occlusion
   b) Anatomical pattern of blood supply
   c) Presence/ absence of anastomotic circulation
6. Clinical features (common to all types of heart failure):
   a) (Mild) anemia
   b) ↓ weight & skeletal muscle bulk
   c) Renal failure
   d) Pleural & peritoneal effusions
   e) (Other non-specific symptoms)

PART CJ 02 (B): LEFT HEART FAILURE

7. (Most common) etiologies:
   a) IHD
   b) HT
   c) Aortic & mitral valvular disease

8. Effects:
   - Progressive blood pooling (in pulmonary circulation)
   - Blood stasis (in left-sided chambers)
   - Tissue hypoperfusion

9. Clinical features:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyspnea</td>
<td>(1st symptom)</td>
</tr>
</tbody>
</table>
4. Diagnosis (according to Jones clinical criteria):

### Major Criteria
- Migratory polyarthritis
- Pan-carditis
- Subcutaneous nodules
- Sydenham chorea (involuntary head movement)
- Erythema marginatum

### Minor Criteria
- Non-specific symptoms (weight loss, malaise)
- Fever
- Arthralgia
- Acute-phase reactants (in serum)
- ↑ ESR

**Immune response (Igs) against M proteins (in cell wall of bacteria)**

**CD4+ T cells** specific for Strep peptides

**Cross-react with self-proteins in heart**

**Inflammation**

**Pathogen removed, but Igs still remain**

**Igs attack heart valves**

**Exudate** present in pericardial space & joints

**Heart unable to expand & rubs against exudate**

**Pericardial friction** (detected by stethoscope)

**Vegetations** grow (due to protection from immune defences)

**Bacteria adhere via dextran, adhesins & fibronectin-binding protein**

**Multiply & attract more fibrin & platelet deposition**
5. Predisposing factors:

1. Degenerative valve/ rheumatic heart disease
2. Congenital defects (e.g. bicuspid aortic valve)
3. Mitral valve prolapse
4. Prosthetic valves
5. Immunosuppression & hemodialysis
6. IV drug abuse

6. Pathogenesis:

[Diagram of Microbes (from normal flora) liberated into bloodstream]

Strep. viridans in oral cavity released during dental procedures
Strep. fecalis in colon & UG tract released during operations
Staph. aureus & Candida in skin released during venepuncture/IV cannula/operation
Survive action of antibodies & complement
Deposition (damaged) heart valve adheres to platelet & fibrin
Form vegetations

7. Morphology:

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Morphology</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PART CJ 06: CONGENITAL HEART DISEASES

SUB-PART CJ 06 (A): GENERAL

1. Shunt = abnormal communication between chambers or vessels

2. Types of congenital heart malformations:
   a) Left to right
   b) Right to left
   c) Obstruction

3. Classification (according to presence of cyanosis):

<table>
<thead>
<tr>
<th>Non-cyanotic</th>
<th>Cyanotic</th>
</tr>
</thead>
<tbody>
<tr>
<td>• ASD (atrial septal defect)</td>
<td>• Tetralogy of Fallot</td>
</tr>
<tr>
<td>• VSD (ventricular septal defect)</td>
<td>• Tricuspid atresia</td>
</tr>
<tr>
<td>• PDA (patent ductus arteriosus)</td>
<td></td>
</tr>
</tbody>
</table>

SUB-PART CJ 06 (B): LEFT TO RIGHT SHUNT

SUB-SUB-PART CJ 06 (B 1): GENERAL

4. Results in ↑ pulmonary flow → pulmonary HT

5. Not associated with cyanosis (acyanotic congenital heart disease)

SUB-SUB-PART CJ 06 (B 2): ASD

6. Is the most common congenital anomaly

7. There is abnormal opening in atrial septum

8. Occurs because pulmonary vascular resistance < systemic vascular resistance