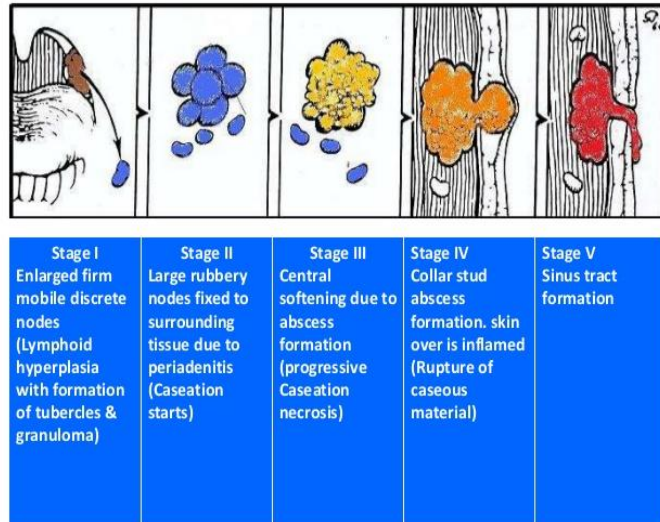
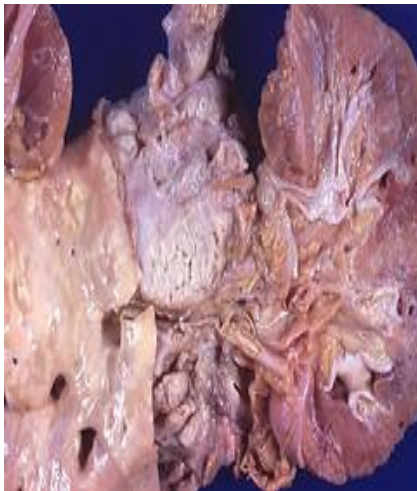


## Tuberculous Lymphadenitis:-



This is a specimen of lymph nodes which are matted. Cut surface shows caseation. Hence, it is tuberculous lymphadenitis.

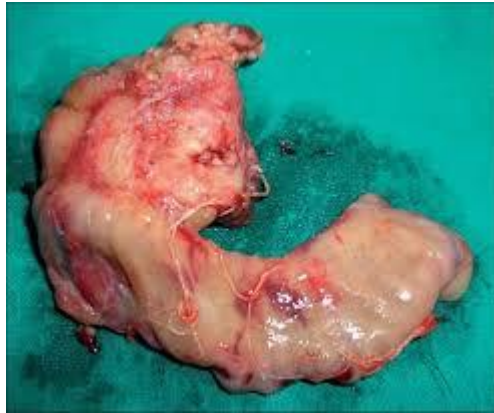
Microscopically, central cessation surrounded by epithelioid cells, Langhan's type of giant cells.

### Stages-

- Stage of Lymphadenitis
- Stage of matting
- Stage of cold abscess
- Stage of collar stud abscess
- Stage of sinus formation

❖ Matting seen in this is because of periadenitis.

## HODGKIN'S LYMPHOMA



This is a specimen of multiple lymph nodes which are discrete & not matted. Cut surface does not show cessation. It is homogenous. Hence, this is a specimen of Hodgkin's lymphoma. Hodgkin's lymphoma — formerly known as Hodgkin's disease — is a cancer of the lymphatic system, which is part of immune system. In Hodgkin's lymphoma, cells in the lymphatic system grow abnormally and may spread beyond the lymphatic system. As Hodgkin's lymphoma progresses, it compromises your body's ability to fight infection.

Hodgkin's lymphoma is one of two common types of cancers of the lymphatic system. The other type, non-Hodgkin's lymphoma, is far more common.

Advances in diagnosis and treatment of Hodgkin's lymphoma have helped give people with this diagnosis the chance for a full recovery. The prognosis continues to improve for people with Hodgkin's lymphoma.

Diagnosis is confirmed by lymph node biopsy.

Microscopically, cellular pleiomorphism; lymphocytes, histiocytes, eosinophils, monocytes with giant cells containing mirror image nuclei- Reed- Sternberg cell. Common lymph nodes involved in Hodgkin's lymphoma are cervical, axillary, Para-aortic, iliac & inguinal lymph nodes.

## Chronic Gastric Ulcer



The specimen consists of an irregular portion of gastric wall. The ulcer is oval in shape and deeply penetrating. Necrotic debris covers the base. The specimen has been cut to show the sub mucosa, muscle coat and adventitial connective tissues in the region of the ulcer. Note that there is extensive fibrosis of the sub mucosa in this area and absence of the external muscle coat. Grey/white fibrous tissue can be seen extending beyond the muscle coat into the adventitial connective tissues. These are the features of a chronic ulcer. The uninvolved mucosa shows some tethering of the mucosal folds towards the ulcer but is otherwise unremarkable

**Causes:-** Peptic ulcers are directly caused by the destruction of either the intestinal or gastric lining of a person's stomach by hydrochloric acid, a form of acid that is present in the digestive juices of the stomach. An infection, caused by the *Helicobacter Pylori* bacterium, is believed to play a role in causing both duodenal and gastric ulcers. The bacterium can be transmitted from person to person via food that has been contaminated, as well as through water. An injury to the gastric mucosal lining, in combination with a weakening of the person's mucous defenses, can also cause a gastric ulcer. Excessive secretion of hydrochloric acid, psychological stress, as well as genetic predisposition, are contributing factors to either the formation or worsening of duodenal ulcers. Chronic use of anti-inflammatory medications, as well as cigarette smoking, can worsen duodenal ulcers, or cause treatment to fail.

A person's stomach defends itself from pepsin and hydrochloric acid through the creation of a mucus coating which shields their stomach, production of bicarbonate, and circulation of blood to their stomach lining in order to assist in both cell renewal and repair. Should any of these functions which protect a person's stomach experience impairment, an ulcer may form. Caffeine stimulates the secretion of acid in a person's stomach, aggravating pain associated with an existing ulcer. Non-steroidal anti-inflammatory medication, such as ibuprofen, aspirin, naproxen, or piroxicam, can interfere with the stomach's ability to produce bicarbonate and mucus, as well as affecting the flow of blood to a person's stomach, hindering cell repair and causing the stomach's defense mechanisms to fail.

Alcoholic cirrhosis has been linked to increased risk of ulcers, while heavy drinking has been shown to delay the healing of ulcers. While emotional stress may not cause ulcers, people who have ulcers report that emotional stress has increased the pain they experience in association with ulcers. Physical stress increases a person's risk of developing gastric ulcers.

## INTUSSUSCEPTION



This is a picture of intestine showing one portion of bowel invaginated within the other. It is diagnosed as an intussusception.

Ileocolic is the commonest type of intussusception.

There are different types of intussusception as follows; Intussusceptum, Intussuscipiens, neck & apex.

Path physiology:-

In the most frequent type of intussusception, the ileum enters the caecum. However, other types occur, such as when a part of the ileum or jejunum prolapses into itself. Almost all intussusceptions occur with the intussusceptum having been located proximally to the intussuscipiens. This is because peristaltic action of the intestine pulls the proximal segment into the distal segment. There are, however, rare reports of the opposite being true.

An anatomic *lead point* (that is, a piece of intestinal tissue that protrudes into the bowel lumen) is present in approximately 10% of intussusceptions.

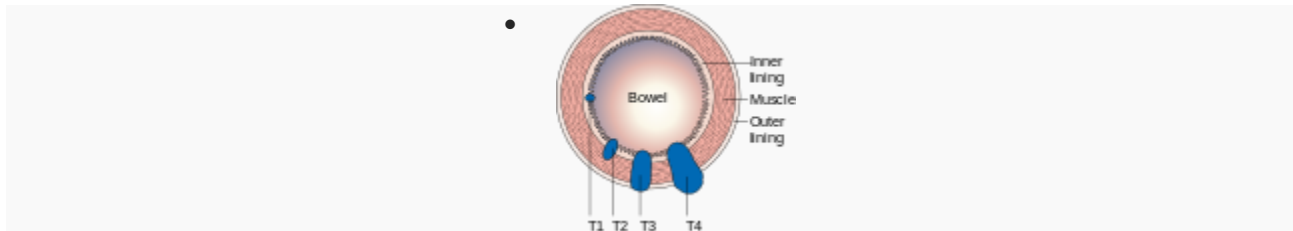
The trapped section of bowel may have its blood supply cut off, which causes ischemia (lack of oxygen in the tissues). The mucosa (gut lining) is very sensitive to ischemia, and responds by sloughing off into the gut. This creates the classically described "red currant jelly" stool, which is a mixture of sloughed mucosa, blood, and mucus. A study reported that in actuality, only a minority of children with intussusception had stools that could be described as "red currant jelly," and hence intussusception should be considered in the differential diagnosis of children passing *any* type of bloody stool.

# CARCINOMA RECTUM

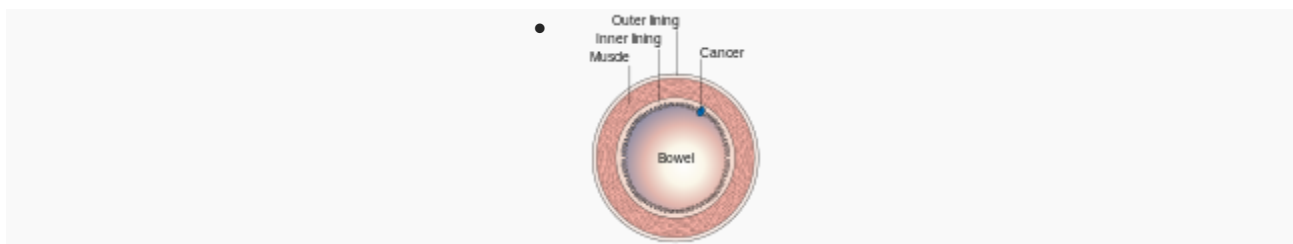


This is a picture of rectum showing ulcero-proliferative growth in the middle of the rectum. This is seen in carcinoma of rectum.

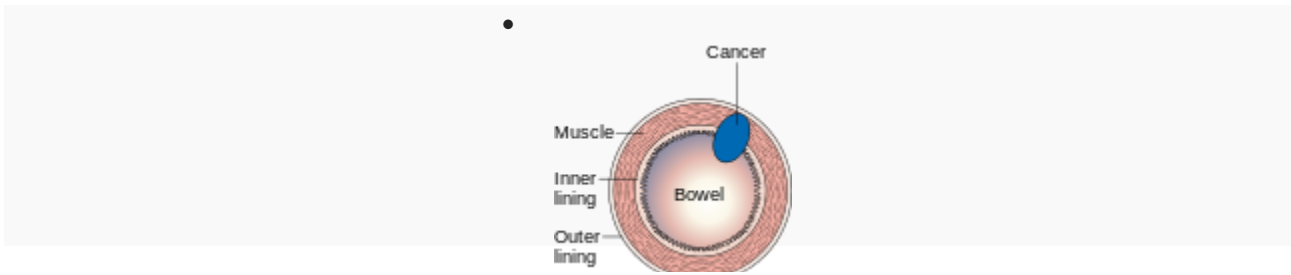
## **Staging:-**



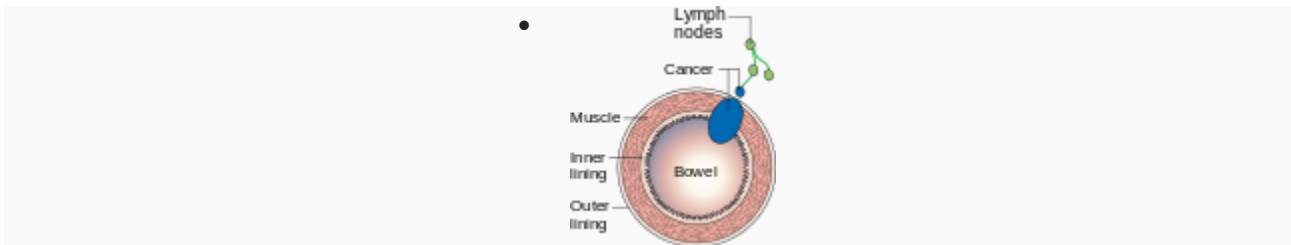
The T stages of bowel cancer



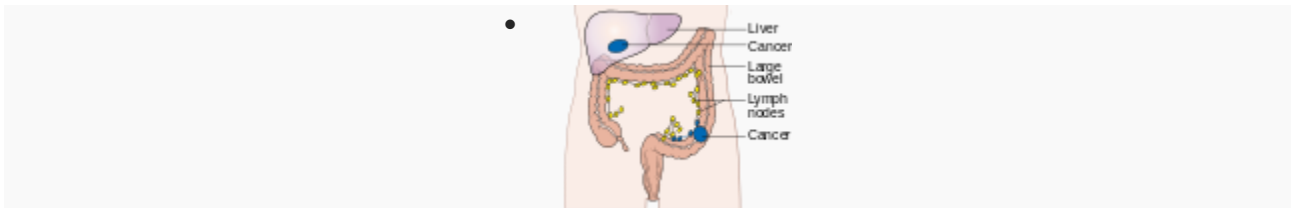
Dukes stage A bowel cancer; the cancer is only in the inner lining of the bowel.



Dukes stage B bowel cancer; the cancer has invaded the muscle



Dukes stage C bowel cancer; the cancer has invaded the nearby lymph nodes



Dukes stage D bowel cancer; the cancer has metastasized



## MECKEL'S DIVERTICULUM



This is a picture of intestine showing a diverticulum.

Common symptoms are bleeding per rectum, abdominal pain due to inflammation, intestinal obstruction & peritonitis due to perforation.

It can be diagnosed by radio-nuclear scan when there is active bleeding.

Gross section shows, Although Meckel's diverticulum is the most prevalent congenital abnormality of the gastrointestinal tract, it is often difficult to diagnose. It may remain completely asymptomatic, or it may mimic such disorders as Cohn's disease, appendicitis and peptic ulcer disease. Ectopic tissue, found in approximately 50 percent of cases, consists of gastric tissue in 60 to 85 percent of cases and pancreatic tissue in 5 to 16 percent. The diagnosis of Meckel's diverticulum should be considered in patients with unexplained abdominal pain, nausea and vomiting, or intestinal bleeding. Major complications include bleeding, obstruction, intussusception, diverticulitis and perforation.

## POLYCYSTIC KIDNEY



This is picture of kidney with multiple cystic lesions. Entire kidney is involved. Here, kidney is grossly enlarged, outer surface is bosselated, multiple cysts are present.

C/F are bilateral renal mass, hypertension, haematuria.

A number of acquired and genetic diseases can result in polycystic kidney and liver disease. The various forms differ with respect to the way in which they are inherited (autosomal dominant, autosomal recessive or X-linked), the range of renal and extra-renal manifestations that accompany the cystic disease, the age at which renal failure most commonly presents (childhood vs adult), and the mutant gene responsible for causing the disorder.

It occurs in humans and some other animals. PKD is characterized by the presence of multiple cysts (hence, "polycystic") typically in both kidneys; however 17% of cases initially present with observable disease in one kidney, with most cases progressing to bilateral disease in adulthood. The cysts are numerous and are fluid-filled, resulting in massive enlargement of the kidneys. The disease can also damage the liver, pancreas and, in some rare cases, the heart and brain. The two major forms of polycystic kidney disease are distinguished by their patterns of inheritance



## HYDRONEPHROSIS



This is a picture of the kidney with ureter showing dilatation of pelvicalyceal system. Calyces are club shaped. It is diagnosed as a hydronephrosis probably due to pelvi-ureteric junction obstruction.

Here, PUJ is obstructed because ureter is not dilated.

Commonest causes are,

- stone in the pelvis,
- aberrant vessels- a lower polar artery or vein arising from the main vessels in an aberrant position obstructs the upper ureter,
- PUJ dyskinesia- occurs due to inco-ordination between neuromuscular impulses and pelvis.

### Patho physiology

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Obstruction that occurs anywhere along the upper urinary tract will lead to increased pressure within the structures of the kidney due to the inability to pass urine from the kidney to the bladder. Obstruction occurring in the lower urinary tract can also cause this increased pressure through the reflux of urine into the kidney. Common causes include bladder dysfunction (such as neurogenic bladder) and urethral obstruction (such as posterior urethral valves in male infants) or compression (such as from prostatic hypertrophy in older male adults).

Anything that causes obstruction leads to increased pressure being transmitted to the delicate tissues that make up the filtration system within the kidneys, which could eventually result in infection, stone formation, or loss of function. Additional complications arising from obstruction of the lower urinary tract include the stagnation of urine flow which can also lead to infection in the bladder.

## HYDATID CYST



Tapeworm with Echinococcus

This is a picture of laminated membranes- thin layer is also called ectocyst. It is thick & elastic resembling onion skin appearance.

Infections are usually acquired during childhood. Growth of cysts is a very slow process; hence clinical features may not appear for years unless when vital organs get

**Hydatid Cysts in the brain** may produce signs and symptoms similar to those produced by space occupying lesions: Headache, dizziness, decreased level of consciousness.

**Liver cysts** may cause abdominal pain, jaundice or a palpable mass.

**Lung cysts (pulmonary cysts)** may rupture causing cough, chest pain, and hemoptysis.

**Kidney Cyst** – may produce pain or obstruction to the kidney, but most often produce no symptoms.

Rupture of a liver cyst result in spill of contents into bile duct, peritoneal cavity, or lung resulting in *fever, urticaria, and serious anaphylactic reactions.*

## GALL STONES



Gallstones are hard, pebble-like deposits that form inside the gallbladder. Gallstones may be as small as a grain of sand or as large as a golf ball

### Characteristics and composition:-

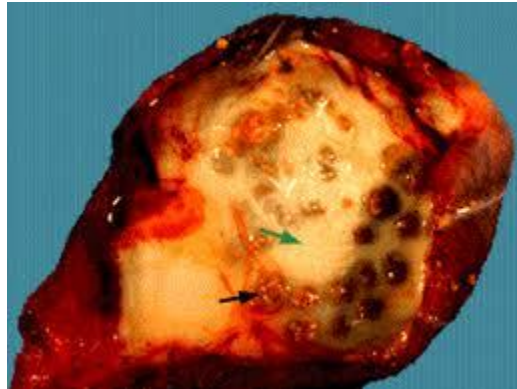
Gallstones can vary in size and shape from as small as a grain of sand to as large as a golf ball. The gallbladder may contain a single large stone or many smaller ones. Pseudoliths, sometimes referred to as sludge, are thick secretions that may be present within the gallbladder, either alone or in conjunction with fully formed gallstones. The clinical presentation is similar to that of cholelithiasis. The composition of gallstones is affected by age, diet and ethnicity. On the basis of their composition, gallstones can be divided into the

**Following types: Cholesterol stones:-** Cholesterol stones vary from light yellow to dark green or brown or chalk white and are oval, usually solitary, between 2 and 3 cm long, each often having a tiny, dark, central spot. To be classified as such, they must be at least 80% cholesterol by weight (or 70%, according to the Japanese- classification system).

**Black Pigment stones:-** Pigment stones are small and dark and comprise bilirubin (Insoluble bilirubin pigment polymer) and calcium (calcium phosphate) salts that are found in bile, usually black and multiple. They contain less than 20% of cholesterol (or 30%, according to the Japanese-classification system).

**Mixed stones (Brown pigment stone):-** Mixed gallstones typically contain 20–80% cholesterol (or 30–70%, according to the Japanese- classification system). Other common constituents are calcium carbonate, palmitate phosphate, bilirubin and other bile pigments (calcium bilirubinate, calcium palmitate and calcium stearate). Because of their calcium content, they are often radiographically visible.

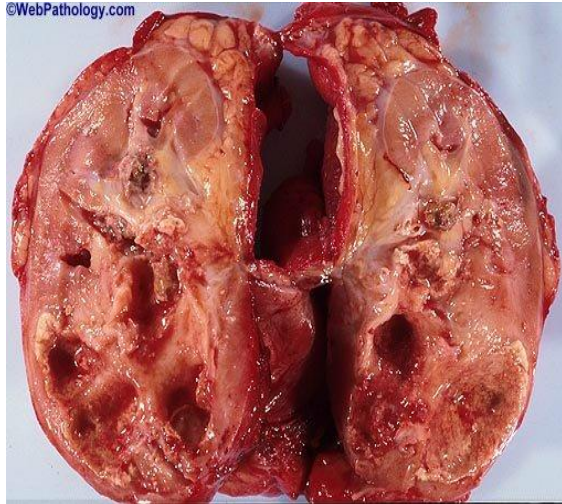
## CHRONIC CHOLECYSTITIS



Cholecystitis is inflammation of the gallbladder. Although most people with gallstones do not have symptoms and will not go on to develop cholecystitis, cholecystitis occurs most commonly due to blockage of the cystic duct with gallstones (cholelithiasis). This blockage causes a buildup of bile in the gallbladder and increased pressure within the gallbladder, leading to right upper abdominal pain. Concentrated bile, pressure, and sometimes bacterial infection irritate and damage the gallbladder wall, causing inflammation and swelling of the gallbladder. Inflammation and swelling of the gallbladder can reduce normal blood flow to areas of the gallbladder, which can lead to cell death due to inadequate oxygen.

Chronic cholecystitis occurs after repeated episodes of acute cholecystitis and is almost always due to gallstones. Chronic cholecystitis may be asymptomatic, may present as a more severe case of acute cholecystitis, or may lead to a number of complications such as gangrene, perforation, or fistula formation.

## RENAL CALCULUS



Staghorn calculus

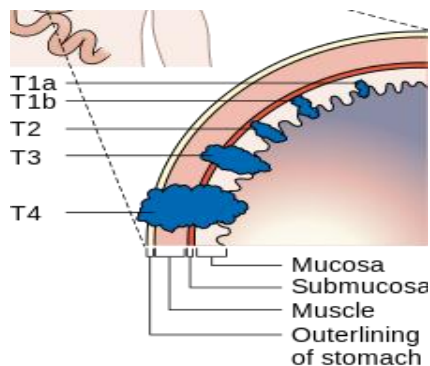
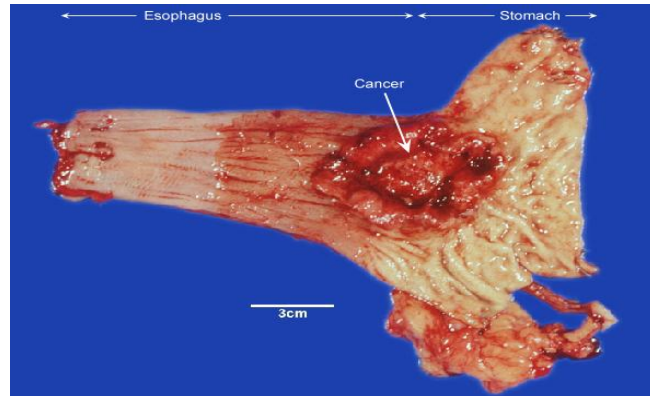
Kidney stones are typically classified by their location and chemical composition.

Kidney Stone type	Population	Circumstances	Color	Sensitivity	Details
Calcium oxalate	80%	when urine is acidic (decreased pH)	Black/Dark brown	Radio-opaque	Some of the oxalate in urine is produced by the body. Calcium and oxalate in the diet play a part but are not the only factors that affect the formation of calcium oxalate stones. Dietary oxalate is an organic molecule found in many vegetables, fruits, and nuts. Calcium from bone may also play a role in kidney stone formation.
Calcium phosphate	5–10%	when urine is alkaline (high pH)	Dirty white	Radio-opaque	Tends to grow in alkaline urine especially when proteus are present.
Uric acid	5–10%	when urine is persistently acidic	Yellow/Reddish brown	Radiolucent	Diets rich in animal proteins and purines: substances found naturally in all food but especially in organ meats, fish, and shellfish.

Struvite	10–15%	infections in the kidney	Dirty white	Radio-opaque	Preventing struvite stones depends on staying infection-free. Diet has not been shown to affect struvite stone formation.
Cystine	1–2% <sup>[48]</sup>	rare genetic disorder	Pink/Yellow	Radio-opaque	Cystine, an amino acid (one of the building blocks of protein), leaks through the kidneys and into the urine to form crystals.
Xanthine <sup>[49]</sup>		Extremely rare	Brick red	Radio-opaque	



## Cancer of stomach



- **Stage 0.** Limited to the inner lining of the stomach. Treatable by endoscopic mucosal resection when found very early (in routine screenings); otherwise by gastrectomy and lymphadenectomy without need for chemotherapy or radiation.
- **Stage I.** Penetration to the second or third layers of the stomach (**Stage 1A**) or to the second layer and nearby lymph nodes (**Stage 1B**). Stage 1A is treated by surgery, including removal of the omentum. Stage 1B may be treated with chemotherapy (5-fluorouracil) and radiation therapy.
- **Stage II.** Penetration to the second layer and more distant lymph nodes, or the third layer and only nearby lymph nodes, or all four layers but not the lymph nodes. Treated as for Stage I, sometimes with additional neoadjuvant chemotherapy.
- **Stage III.** Penetration to the third layer and more distant lymph nodes, or penetration to the fourth layer and either nearby tissues or nearby or more distant lymph nodes. Treated as for Stage II; a cure is still possible in some cases.
- **Stage IV.** Cancer has spread to nearby tissues and more distant lymph nodes, or has metastasized to other organs. A cure is very rarely possible at this stage.

## APPENDICITIS

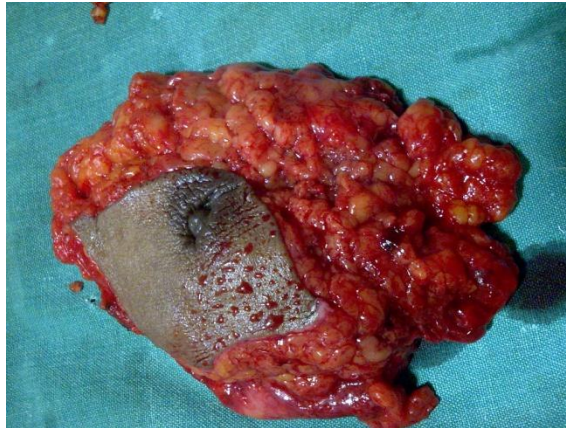


**Appendicitis** is inflammation of the appendix. Appendicitis commonly presents with right iliac fossa abdominal pain, nausea, vomiting, and decreased appetite. However, one third to a half of persons do not have these typical signs and symptoms. Severe complications of a ruptured appendix include wide spread, painful inflammation of the inner lining of the abdominal wall and sepsis.

Appendicitis is caused by a blockage of the hollow portion of the appendix, most commonly by a calcified "stone" made of feces. However inflamed lymphoid tissue from a viral infection, parasites, gallstone or tumors may also cause the blockage. This blockage leads to increased pressures within the appendix, decreased blood flow to the tissues of the appendix, and bacterial growth inside the appendix causing inflammation. The combination of inflammation, reduced blood flow to the appendix and distention of the appendix causes tissue injury and tissue death. If this process is left untreated, the appendix may burst, releasing bacteria into the abdominal cavity, leading to severe abdominal pain and increased complications.

Pain first, nausea and vomiting next, and fever last has been described as the classic presentation of acute appendicitis. Because the innervation of the appendix enters the spinal cord at the same level as the umbilicus (belly button), the pain begins stomach-high. As the appendix becomes more swollen and inflamed, it begins to irritate the adjoining abdominal wall. This leads to the localization of the pain to the. This classic migration of pain may not be seen in children under three years. This pain can be elicited through various signs and can be severe. Signs include localized findings in the right iliac fossa. The abdominal wall becomes very sensitive to gentle pressure (palpation). Also, there is severe pain on sudden release of deep pressure in the lower abdomen (rebound tenderness). If the appendix is retrocecal (localized behind the caecum), even deep pressure in the right lower quadrant may fail to elicit tenderness (silent appendix). This is because the caecum, distended with gas, protects the inflamed appendix from pressure. Similarly, if the appendix lies entirely within the pelvis, there is usually complete absence of abdominal rigidity. In such cases, a digital rectal examination elicits tenderness in the rectovesical pouch. Coughing causes point tenderness in this area (McBurney's point)

## Cancer of Breast



Breast cancer, like other cancers, occurs because of an interaction between an environmental (external) factor and a genetically susceptible host. Normal cells divide as many times as needed and stop. They attach to other cells and stay in place in tissues. Cells become cancerous when they lose their ability to stop dividing, to attach to other cells, to stay where they belong, and to die at the proper time.

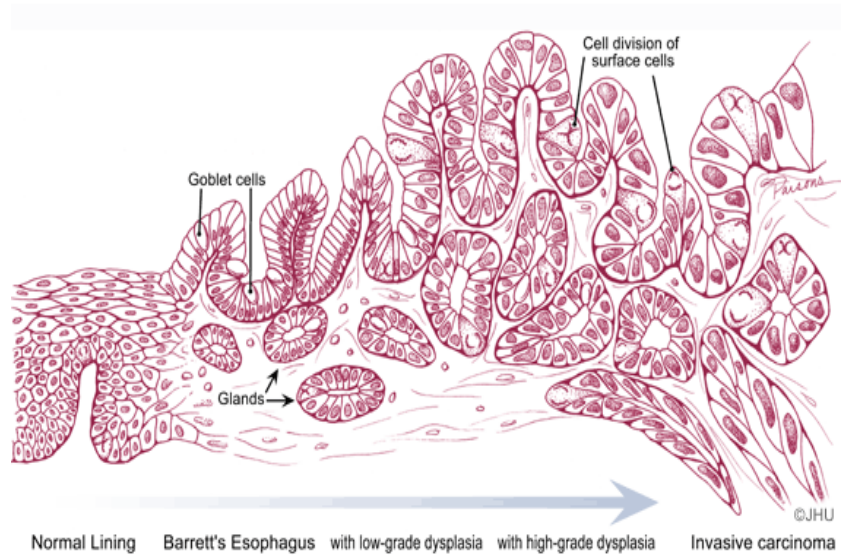
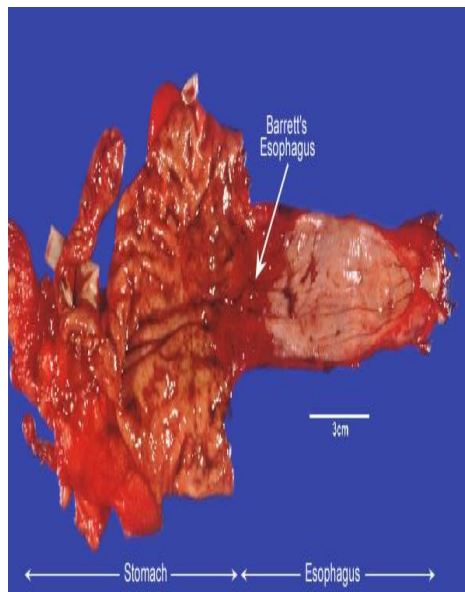
Normal cells will commit cell suicide (apoptosis) when they are no longer needed. Until then, they are protected from cell suicide by several protein clusters and pathways. One of the protective pathways is the PI3K/AKT pathway; another is the RAS/MEK/ERK pathway. Sometimes the genes along these protective pathways are mutated in a way that turns them permanently "on", rendering the cell incapable of committing suicide when it is no longer needed. This is one of the steps that causes cancer in combination with other mutations. Normally, the PTEN protein turns off the PI3K/AKT pathway when the cell is ready for cell suicide. In some breast cancers, the gene for the PTEN protein is mutated, so the PI3K/AKT pathway is stuck in the "on" position, and the cancer cell does not commit suicide.

Mutations that can lead to breast cancer have been experimentally linked to estrogen exposure.

Abnormal growth factor signaling in the interaction between stromal cells and epithelial cells can facilitate malignant cell growth. In breast adipose tissue, over expression of leptin leads to increased cell proliferation and cancer.

The familial tendency to develop these cancers is called hereditary breast–ovarian cancer syndrome.

## CA OESOPHAGUS



### SPECIMEN: -

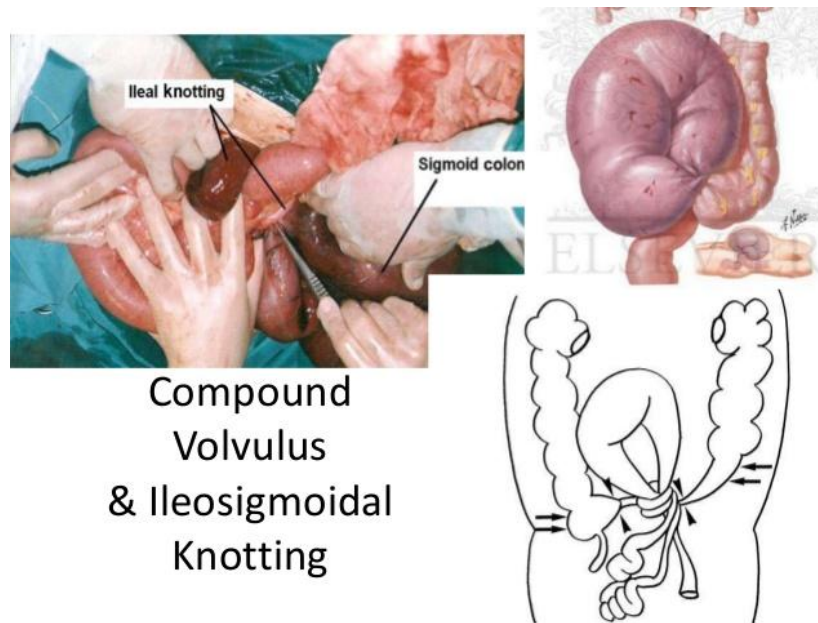
This specimen is a segment of an esophagus and a portion of the stomach from a patient with high-grade dysplasia in Barrett's esophagus. The esophagus and stomach have been opened and the esophagus is the narrower area on the right of the frame. The inside lining is whitish on the right but appears reddish and velvety closer to the stomach. The reddish area is Barrett's esophagus. There is no tumor (mass) in this specimen, which showed high-grade dysplasia (severe pre-cancerous change) on microscopic examination.

### MICROSCOPICALLY: -

Presence of Barrett's esophagus is associated with increased risk of developing an invasive cancer (adenocarcinoma). Columnar epithelial dysplasia as seen in Barrett's esophagus is a premalignant lesion for adenocarcinoma. Adeno carcinoma does not develop "out of the blue". Instead, adenocarcinoma in Barrett's esophagus develops in a sequence of changes, from nondysplastic (metaplastic) columnar epithelium, through low (precancerous change detected under the microscope) and finally invasive cancer. This makes early detection and early treatment a possibility.



## GANGRENE DUE TO SIGMOID VOLVULUS



Compound  
Volvulus  
& Ileosigmoidal  
Knotting

A large sigmoid colon distended with the gas of a high-fiber diet is more liable to twist on its mesentery. This is the commonest cause of large gut obstruction in most communities in the developing world, and is sufficiently characteristic to allow you to diagnose it before you do a laparotomy. If an obstructed sigmoid colon strangulates, its wall will become gangrenous, and may perforate. Sigmoid volvulus is however less dangerous and more common than volvulus of the small gut.

There are several kinds of sigmoid volvulus: (1) The common volvulus of the large thick-walled pelvic colon that is usual in people who eat a high-fiber diet, and which usually presents sub acutely. (2) The less common volvulus of the thin-walled type of pelvic colon which usually presents acutely. (3) A rare compound volvulus in which the small gut twists around a volvulus of the sigmoid.

## TOXIC MEGACOLON



**Toxic mega colon** (*mega colon toxicum*) is an acute form of colonic distension. It is characterized by a very dilated colon (mega colon), accompanied by abdominal distension (bloating), and sometimes fever, abdominal pain, or shock.

Toxic mega colon is usually a complication of inflammatory bowel disease, such as ulcerative colitis and, more rarely, Crohn's disease, and of some infections of the colon, including *Clostridium difficile* infections, which have led to pseudo membranous colitis. Other forms of mega colon exist and can be congenital (present since birth, such as Hirschsprung's disease). Also, it can be caused by *Entamoeba histolytica* and Shigella.

- Ulcerative colitis or Crohn's disease in the colon are the most common causes of toxic mega colon. In such patients episodes may be triggered by a worsening of the disease, other superimposed diseases resulting in prolonged bed rest, or discontinuing or decreasing prescribed dosages of anti-inflammatory agents such as sulfasalazine or the 5-aminosalicylic acid (5-ASA) drugs.
- Some medications—including narcotics (such as morphine and codeine), anticholinergic agents (such as scopolamine and atropine) and some antidepressants—may lead to toxic mega colon.



## LIPOMA



There are many subtypes of lipomas:

- **Adenolipomas** are lipomas associated with eccrine sweat glands.
- **Angiolipoleiomyomas** are acquired, solitary, asymptomatic acral nodules, characterized histologically by well-circumscribed subcutaneous tumors composed of smooth muscle cells, blood vessels, connective tissue, and fat.
- **Angiolipomas** painful subcutaneous nodules having all other features of a typical lipoma
- **Cerebellar pontine angle and internal auditory canal lipomas**
- **Chondroid lipomas** are deep-seated, firm, yellow tumors that characteristically occur on the legs of women.
- **Corpus callosum lipoma** is a rare congenital brain condition that may or may not present with symptoms. This occurs in the corpus callosum, also known as the colossal commissure, which is a wide, flat bundle of neural fibers beneath the cortex in the human brain.
- **Hibernomas** are lipoma of brown fat.
- **Intradermal spindle cell lipomas** are distinct in that they most commonly affect women and have a wide distribution, occurring with relatively equal frequency on the head and neck, trunk, and upper and lower extremities.
- **Neural fibrolipomas** are overgrowths of fibro-fatty tissue along a nerve trunk, which often leads to nerve compression.
- **Pleomorphic lipomas**, like spindle-cell lipomas, occur for the most part on the backs and necks of elderly men and are characterized by floret giant cells with overlapping nuclei.
- **Spindle-cell lipomas** are asymptomatic, slow-growing subcutaneous tumors that have a predilection for the posterior back, neck, and shoulders of older men.
- **Superficial subcutaneous lipomas**, the most common type of lipoma, lie just below the surface of the skin. Most occur on the trunk, thigh, and forearm, although they may be found anywhere in the body where fat is located.

## SEBACEOUS CYST



### Presentation:-

The scalp, ears, back, face, and upper arm, are common sites for sebaceous cysts, though they may occur anywhere on the body except the palms of the hands and soles of the feet. In males a common place for them to develop is the scrotum and chest. They are more common in hairier areas, where in cases of long duration they could result in hair loss on the skin surface immediately above the cyst. They are smooth to the touch, vary in size, and are generally round in shape.

They are generally mobile masses that can consist of:

- Fibrous tissues and fluids,
- A fatty (keratinous) substance that resembles cottage cheese, in which case the cyst may be called "keratin cyst" This material has a characteristic "cheesy" or foot odor smell,
- A somewhat viscous, serosanguineous fluid (containing purulent and bloody material).

The nature of the contents of a sebaceous cyst, and of its surrounding capsule, will be determined by whether the cyst has ever been infected.