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### ***Histopathology Practicals and slide numbers***

#### **Note:**

The following is a guideline of the main microscopic features to the provided glass slides and is not meant to be a full description. Students are advised to examine the microscopic appearances and to draw labelled diagrams. Different sections may be used for examination.

#### **Inflammation and Repair:**

- [1] ***Fibrinous pericarditis: Section of heart shows:***
  - The pericardium is distorted by thick irregular layer of pinkish fibrinous exudate with some red cells and inflammatory cells.
  - The subpericardial layer is thickened by edema and shows dilated blood vessels, chronic inflammatory cells and areas of calcification.
  
- [2] ***Acute suppurative appendicitis: Cross section of appendix shows:***
  - Accumulation of inflammatory exudate and pus cells in the lumen and the mucosa is ulcerated.
  - All layers of the appendix wall show edema, dilated and congested blood vessels and infiltration by many neutrophils.
  - Fibrino-purulent exudate is present on the serosal surface.
  
- [3] ***Foreign body reaction (pilonidal sinus): Section of skin shows:***
  - A sinus tract lined by an inflammatory granulation tissue in the dermis.
  - The lumen of sinus and wall contain large number of hair shafts with foreign body giant cells, lymphocytes, macrophages & neutrophils.
  
- [4] ***Granulation tissue: Section of fragments of edematous, loose connective tissue shows:***
  - Many small newly formed capillaries lined by plump endothelial cells.
  - Proliferation of fibroblasts is seen.
  - Inflammatory cells including macrophages, lymphocytes, plasma cells and neutrophils in the oedematous stroma.
  - Pink homogenous collagen fibres may be identified.

### **Degeneration and infiltrations:**

- [5] ***Fatty change of the liver: Section of liver shows:***
- Normal lobular architecture.
  - The liver cells are distended by clear vacuoles of dissolved fat with displacement of nuclei to the periphery.
  - Fatty cysts may be seen.
  - No inflammation and no fibrosis.
- [6] ***Amyloidosis of the liver: Section of the liver shows:***
- Deposits of homogenous eosinophilic amyloid material in the walls of blood sinusoids and between the groups of liver cells.
  - Liver cells are compressed, atrophied and may disappear in areas.
  - Some fatty change is also seen.
- [7] ***Amyloidosis of the kidney:***
- Sections from this renal biopsy show a core of renal tissue containing seven glomeruli which are showing varying degrees of replacement by homogenous pink amyloid deposits. The glomeruli are also hypocellular with obliteration of some glomerular vessels. The interstitium is slightly fibrotic and contains chronic inflammatory cells. Some blood vessels in the interstitium also show deposition of amyloid material.
- [8] ***Dystrophic calcification:Section of skin shows:***
- Irregular blue granular deposits of calcium in the dermis surrounded by fibrous tissue and foreign body giant cell reaction.

### **Circulatory disorders:**

- [9] ***Chronic venous congestion of the liver: Section of liver shows:***
- The central portion of liver lobules show congestion and dilatation of central veins and blood sinusoids, with atrophy and necrosis of liver cells.
  - Kupffer cells contain few brown haemosiderin pigment granules.
- [10] ***Chronic venous congestion of the lung: Section of lung shows:***
- The alveolar walls are thickened by dilated and engorged capillaries.
  - The alveoli contain edema fluid, red blood cells and large alveolar macrophages (heart failure cells), which are filled with haemosiderin pigment derived from red cells breakdown.
  - In the late stage some fibrous tissue may also be seen.

- [11] **Organizing thrombus:** *Cross section of a blood vessel shows:*
- The lumen is occluded by thrombus which consists of alternate layers of platelets with fibrin thread and clotted blood (line of Zahn).
  - Organization is seen at the periphery of thrombus which also shows formation of small capillaries & fibroblasts with chronic inflammatory cells.
  - Recanalization is seen at one side.
- [12] **Myocardial infarction:** *Section of myocardium shows:*
- Patchy coagulative necrosis of myocardial fibres. The dead muscle fibres are structureless and hyaline.
  - The necrotic muscle fibres are pale with loss of nuclei and striations.
  - Infiltration of neutrophils may be seen.
  - Later granulation tissue formation and fibrosis.
- [13] **Infarcted kidney:** *Section of kidney shows:*
- A cortical infarct showing coagulative necrosis of glomeruli, tubules and interstitial tissue with loss of cell nuclei.
  - The haemorrhagic zone at the periphery of the infarct shows dilated and congested blood vessels and cellular infiltrate by neutrophils, red blood cells and lymphocytes.

## Granulomas

- [14] **Tuberculous lymphadenitis:** *Section of a lymph node with connective tissue capsule and lymphoid tissue shows:*
- Many round and oval tubercles/granulomas with or without central caseation that appears structureless, homogenous and pink in colour.
  - The granulomas consists of epithelioid cells, few Langhan's giant cells (large cell with multiple peripheral nuclei) and peripheral rim of lymphocytes.
- [15] **Miliary tuberculosis of the lung:** *Section of lung shows:*
- The alveolar septae contain many tubercles with or without structureless granular pinkish caseation.
  - Tubercles consist of epithelioid cells, few Langhan's giant cells and peripheral rim of lymphocytes.
- [16] **Lepromatous leprosy of the skin:** *Section of the skin shows:*
- Extensive cellular infiltrate in the dermis consisting of large macrophages (Lepra cells).
  - The infiltrate causes the destruction of the cutaneous appendages and extends into subcutaneous fat.
  - A narrow clear zone separates the flattened epidermis from the infiltrate.



- [17] ***Bilharziasis of the rectum:***     ***Section of fragments of rectal mucosa shows:***
- Many Bilharzial ova with yellow brown shells in mucosa and submucosa surrounded by fibrosis and chronic inflammatory cells consisting of lymphocytes, plasma cells and many eosinophils.
  - Few granulomas are seen around the ova.
- [18] ***Para-vaginal Schistosomiasis:***
- The sections show a mass of fibrovascular connective tissue containing several histiocytic and giant cell granulomas at the centre of which *Schistosoma haematobium* eggs are identified. Many eosinophils are also seen surrounding the described granulomas.

### **Hyperplasia:**

- [19] ***Cystic hyperplasia of the endometrium:***     ***Section shows fragments of endometrial tissue and blood clot:***
- The endometrial glands are increased in number and show marked variation in size and shape and some are cystically dilated.
  - The glands are lined by more than one layer of tall columnar epithelium with many mitoses.
  - The stroma in between the glands is increased and cellular.
- [20] ***Cystic hyperplasia of the breast:***     ***Section of breast shows:***
- Adenosis: Increased in number and size of glands.
  - Epitheliosis: Epithelial hyperplasia of ducts with occasional papillae formation.
  - Cystic dilatation of some ducts.
  - Few cystic ducts are lined by large cells with eosinophilic cytoplasm (apocrine metaplasia).
  - Dense hyalinized fibrous tissue around ducts with scattered lymphocytes.

### **Benign tumours**

- [21] ***Nevus:***     ***Section of skin shows:***
- Nests and clusters of small round or spindle shaped nevus cells with few melanophages in the upper dermis.
  - The cells contain varying amount of brown melanin pigment.
  - No junctional activity.

[22] ***Leiomyoma: Section of tumour shows:***

- A well demarcated tumour mass in the muscle coat of uterus without a definite capsule.
- Tumour consists of interlacing bundles of smooth muscle and fibrous tissue.
- The muscle cells are spindle shaped with elongated nuclei and eosinophilic cytoplasm.

[23] ***Chondroma: Section of tumour shows:***

- Lobules of mature cartilage separated by thin trabeculae of fibrous tissue with blood vessels.
- Lobules consists of mature cartilage cells irregularly distributed through pale blue homogenous matrix and are contained within the lacunar spaces singly, in pairs or in tetrads.
- Few bony trabeculae are included in the tumour.

[24] ***Haemangioma: Section of the skin shows:***

- A tumour mass in the dermis which consists of large number of vascular spaces of varying shapes and sizes separated by connective tissue stroma.
- Vascular spaces are lined by the flattened endothelial cells and some contain blood.
- Delicate connective tissue stroma separates the capillary vascular spaces.

[25] ***Fibroadenoma of the breast: Section shows breast tumour:***

A tumour shows proliferation of both glandular tissues and fibrous tissue.

- (a) Proliferating fibrous tissue is invaginating the ducts causing elongation, compression and distortion of the ducts which have slit-like lumen (intracanalicular).
- (b) At places fibrous tissue is arranged around the ducts (pericanalicular) and does not invaginate.

**Malignant tumours:**

[26] ***Basal cell carcinoma of skin: Section of skin shows:***

- Normal epidermis with appendages on both ends of the section.
- Epidermis shows an ulcer covered by inflammatory exudate.
- Dermis is infiltrated by masses of neoplastic basal cell of variable sizes separated by connective tissue stroma.
- The neoplastic cells are small, dark staining and show little pleomorphism and palisading at periphery of masses.
- Some masses show cystic degeneration and melanin pigment.
- Few mitosis are seen.

- [27] ***Squamous cell carcinoma of the skin:***      ***Section of the skin shows:***  
***An ulcer covered by inflammatory exudate.***
- The dermis is infiltrated by masses of well differentiated neoplastic squamous cells which are separated by fibrous tissue stroma with chronic inflammatory cells.
  - Tumour cells show pleomorphism, hyperchromatism and many mitotic figures.
  - Pinkish laminated keratin pearls (epithelial cell nests) are present in the center of some cell masses.
- [28] ***Adenocarcinoma of the large intestine:***      ***Section of large intestine shows:***  
***A tumour mass at one end, and a normal mucosa on the other side.***
- Tumour consists of crowded irregular malignant acini separated by thin fibrovascular stroma.
  - The acini are lined by one or several layers of neoplastic cells with papillary projection showing pleomorphism, hyperchromatism and few mitoses.
  - Muscle coat is invaded by neoplastic glands.
- [29] ***Mucoid carcinoma of the large intestine:***      ***Section of large intestine shows normal mucosa:***
- All the layers under mucosa are infiltrated by masses of tumour cells separated by connective tissue stroma.
  - Tumour cells are present either singly or as imperfect acini floating in large quantities of mucin secreted by malignant cells.
  - The cells are pleomorphic with large basophilic nuclei, pushed to the side due to the presence of intracellular mucin giving a signet-ring appearance.
- [30] ***Fibrosarcoma:***      ***Section of the tumour shows:***
- The tumour consists of interlacing bundles of pleomorphic spindle shaped cells with areas of haemorrhage and necrosis.
  - The cells show marked variation in size and shape, nuclear hyperchromatism with tumour giant cells formation and many mitoses.

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