

## SGD-1

A 50 yrs old male with h/o frequent dental treatments from a road side quack developed hepatitis C infection 20 yrs ago. He is brought to a hepatologist with weakness, fever and pain in the right hypochondrium. On USG the liver reveals a mass. The hepatologist orders a Single tumor marker to come to a diagnosis.

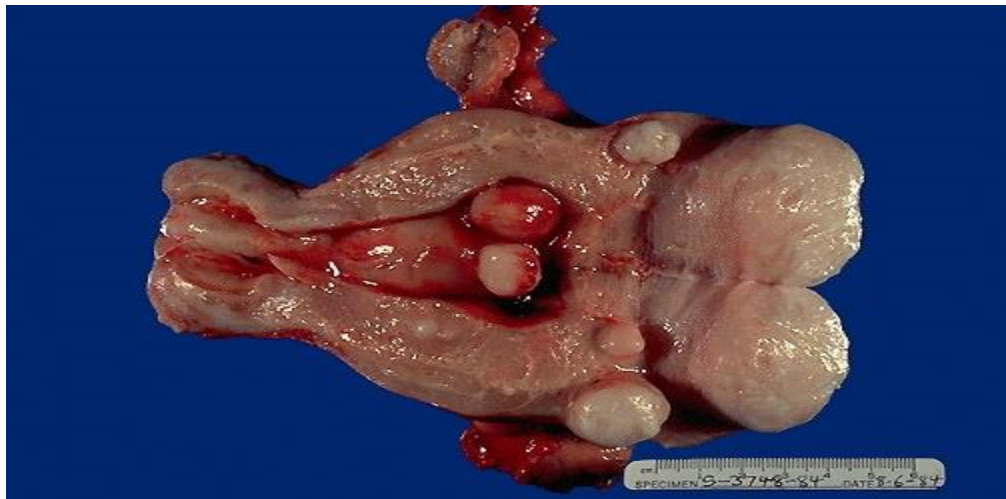
- a) Name the tumor marker he is most likely asked for?
- b) Enlist three tumor markers with their associated tumors.
- c) What is the importance of tumor markers?
- d) Define Differentiation and Anaplasia.
- e) Enumerate the pathways of spread of tumors.

Key:

- a) **Alpha Fetoprotein** (Hepatocellular Carcinoma)
  
- b) Any 3 from table 7-12 Page no 337 Robbins
  - 1. Calcitonin: Medullary carcinoma of Thyroid
  - 2. Prostatic Acid Phosphatase: Prostate cancer
  - 3. CA-125: Ovarian Cancer
  - 4. CA-15-3: Breast cancer
  
- c)
  - 1. Screening in general population
  - 2. Clinical staging of cancer
  - 3. Estimating Tumor volume
  - 4. As a prognostic indicator for disease progression
  - 5. Evaluating the success of treatment
  - 6. Detecting the recurrence of cancer
  
- d) **Differentiation:** The extent to which neoplastic parenchymal cells resemble the corresponding normal parenchymal cells, both morphologically and functionally.  
  
**Anaplasia:** Lack of differentiation
  
- e) Dissemination of cancer may occur through one of three pathways:
  - 1. Direct seeding of Body cavities or surfaces
  - 2. Lymphatic spread
  - 3. Hematogenous Spread

## SGD-2

A 24 yrs old woman with a history of heavy and painful menstrual periods has been having difficulty conceiving despite months of trying to become pregnant. Her workup included a bimanual pelvic examination and an USG, which demonstrated a mass in the uterus that was presumed to be leiomyoma.



- Examine the given specimen of the uterus and identify the pathology.
- Give TWO features of the tumor on gross examination.
- Give the tissue of origin and mention how many parenchymal cell types are involved?
- Name its malignant counterpart.
- Enlist tumors of Mesenchymal origin both benign and malignant.
- Describe Grading of a cancer.
- What is meant by stage of tumors?

Key:

- a) Gross specimen of uterus with Leiomyoma.
- b) Sharply circumscribed, discrete, round firm, gray-white.(Any two)
- c) Tissue of origin is smooth muscle, and it is composed of one parenchymal cell type.
- d) Leiomyosarcoma

e) <b>Benign</b>	<b>Malignant</b>
Fibroma	Fibrosarcoma
Lipoma	Liposarcoma
Chondroma	Chondrosarcoma
Osteoma	Osteogenic sarcoma

f) **Grading of a cancer:** It is based on degree of differentiation of tumor cells, number of mitosis and architectural features. It is the extent to which the tumor cells resemble or fail to resemble their normal counterparts

- a) Well differentiated tumors Grade I
- b) Moderately differentiated tumors Grade II
- c) Poorly differentiated Grade III

**g) Staging of tumors:** It is based on size of the primary lesion, its extent of spread to regional lymph nodes, and the presence or absence of blood-borne metastases.

**American Joint Committee On Cancer Staging** (Commonly used staging system), uses a classification called **TNM system**

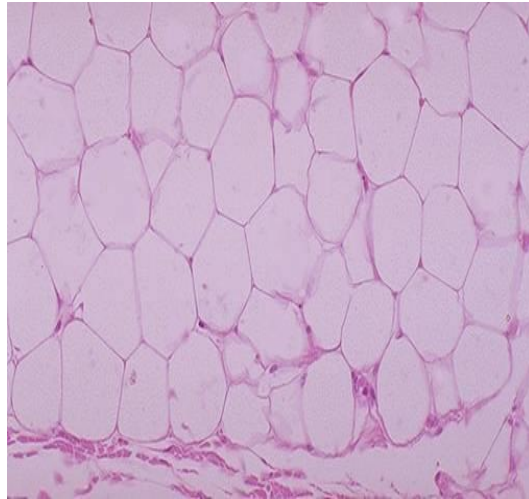
**T-** Primary tumor (based on size T1 to T4)

**N-** Regional lymph node involvement (N0,N1,N2,N3)

**M-** Metastasis (M0,M1,M2)

### SGD: 3

A 20 years old lady complains of a lump on right forearm. It is soft, movable and non-tender. Biopsy specimen is sent for histopathology. Tumor is yellow in color and is greasy on cut section.



- a) Give the microscopic findings.
- b) What is your likely diagnosis?
- c) Name its malignant Counterpart.
- d) Tabulate the differences between Benign and Malignant tumors
- e) Enumerate the cellular and molecular hallmarks of cancer

## KEY

- a) Slide shows tumor composed of fat cells. Fat cells appear empty with nucleus pushed to one side
- b) Lipoma (Benign Mesenchymal tumor)
- c) Liposarcoma (Malignant counterpart)
- d) Table 7-2 Page 274 Robbins & Cotran Volume I
- e) Hallmarks of cancer:
  1. Self-sufficiency in growth signals
  2. Insensitivity to growth-inhibitory signals
  3. Altered cellular metabolism
  4. Evasion of apoptosis
  5. Limitless replicative potential
  6. Sustained Angiogenesis
  7. Ability to invade and metastasize
  8. Ability to evade the host immune response

SGD: 4

A 60 years old radiologist complains ulcer on hand for many months. The hand was amputated based on biopsy report of this lesion.



- a) Give gross appearance of this lesion
- b) What is your diagnosis?
- c) Give one other predisposing condition of this type of lesion
- d) Enumerate the Tumor suppressor genes involved in inhibition of cell cycle progression with associated tumors.
- e) Define Paraneoplastic Syndromes. Give Examples.

KEY:



- a) Irregular nodular ulcer with undermined edge, and local invasion
- b) Squamous cell carcinoma
- c) Besides sun exposure, risk factors for squamous cell carcinoma arising in skin include carcinogens such as tars, chronic ulcers, burn scars, arsenic poisoning, and radiation exposure.
- d) **Inhibitors of Cell Cycle Progression**

### **RB**

(Retinoblastoma, Osteosarcoma, Carcinomas of breast, colon, lung)

### **CDKN2A**

Pancreatic, breast, and esophageal carcinoma. melanoma, certain leukemia

### e) **Paraneoplastic Syndromes**

Some cancer-bearing individuals develop signs and symptoms that cannot readily be explained by the anatomic distribution of the tumor or by the elaboration of hormones indigenous to the tissue from which tumor arose, these are known as paraneoplastic syndromes. **Examples:**

1. **Cushing syndrome** (Small cell carcinoma of lung, Pancreatic carcinoma, Neural tumors)
2. **Hypoglycemia** (Ovarian carcinoma. Fibrosarcoma, Other Mesenchymal sarcomas)
3. **Polycythemia** (Renal carcinoma ,Cerebellar hemangioma, Hepatocellular carcinoma)

