



MCQs

{ ومن لم يذق مرّ التعلّم ساعةً.. تجرع ذلّ الجهل طوال حياته }



References:

Robbins Review

- 1. During heterosexual intercourse, seminal fluid containing HIV contacts vaginal squamous mucosa. Cells capture virions and transport the virus via lymphatics to regional lymph nodes. Within the germinal centers of these lymph nodes, the virions infect CD4+ lymphocytes and proliferate, causing CD4+ cell lysis with release of more virions, which are taken up on the surface of cells having Fc receptors, allowing continued infection by HIV of more CD4+ cells passing through the nodes. Which of the following types of cells is most likely to capture HIV on its surface via Fc receptors?**
- A. B lymphocyte
 - B. CD8+ cytotoxic lymphocyte
 - C. Follicular dendritic cell
 - D. Natural Killer cell
 - E. Langhans giant cell
 - F. Macrophage
 - G. Mast cell
- 2. A 78-year-old man has had increasing difficulties with urination for the past 6 years. He has difficulty starting and stopping the urine stream. On physical examination, his temperature is 37° C and blood pressure is 130/85 mm Hg. The figure shows the representative gross appearance of the bladder. Which of the following laboratory findings is most likely to be reported in this patient?**
- A. Positive antinuclear antibody test
 - B. Hemoglobin concentration of 22.5 g/dL
 - C. Prostate-specific antigen level of 5 ng/mL
 - D. *Schistosoma haematobium* eggs in urine
 - E. Positive skin test for *Mycobacterium tuberculosis*
- 3. A 46-year-old man with a history of poorly controlled diabetes mellitus has had painful, erosive, markedly pruritic lesions on the glans penis, scrotum, and inguinal regions of the skin for the past 2 months. Physical examination shows irregular, shallow, 1- to 4-cm erythematous ulcerations. Scrapings of the lesions are examined under the microscope. Which of the following microscopic findings in the scrapings is most likely to be reported?**
- A. Atypical cells with hyperchromatic nuclei
 - B. Budding cells with pseudohyphae
 - C. Eggs and excrement of mites
 - D. Enlarged cells with intranuclear inclusions
 - E. Spirochetes under dark-field examination
- 4. A 28-year-old man has noticed increasing enlargement and a feeling of heaviness in his scrotum for the past year. On physical examination, the right testis is twice its normal size, and it is firm and slightly tender. An ultrasound examination shows a 3.5-cm solid right testicular mass. Abdominal CT scan shows enlargement of the para-aortic lymph nodes. Multiple lung nodules are seen on a chest radiograph. Laboratory findings include markedly increased serum levels of chorionic gonadotropin and α -fetoprotein. Which of the following neoplasms is the most likely diagnosis?**
- A. Choriocarcinoma
 - B. Large diffuse B-cell lymphoma
 - C. Leydig cell tumor
 - D. Metastatic prostatic adenocarcinoma
 - E. Mixed germ cell tumor
 - F. Pure spermatocytic seminoma

5. The mother of a 2-year-old boy notices that he has had increasing asymmetric enlargement of the scrotum over the past 6 months. On physical examination, there is a well-circumscribed, 2.5-cm mass in the left testis. A left orchiectomy is performed, and histologic examination of this mass shows sheets of cells and ill-defined glands composed of cuboidal cells, some of which contain eosinophilic hyaline globules. Microcysts and primitive glomeruloid structures also are seen. Immunohistochemical staining shows α -fetoprotein (AFP) in the cytoplasm of the neoplastic cells. What is the most likely diagnosis?
- A. Choriocarcinoma
 - B. Leydig cell tumor
 - C. Seminoma
 - D. Teratoma
 - E. Yolk sac tumor
6. A 31-year-old, sexually active woman has had a mucopurulent vaginal discharge for 1 week. On pelvic examination, the cervix appears reddened around the os, but no erosions or mass lesions are present. A Pap smear shows numerous neutrophils, but no dysplastic cells. A cervical biopsy specimen shows marked follicular cervicitis. Which of the following infectious agents is most likely to produce these findings?
- A. *Candida albicans*
 - B. *Chlamydia trachomatis*
 - C. *Gardnerella vaginalis*
 - D. Herpes simplex virus
 - E. Human papillomavirus
 - F. *Neisseria gonorrhoeae*
 - G. *Trichomonas vaginalis*
7. A 32-year-old woman has cyclic abdominal pain that coincides with her menses. Attempts to become pregnant have failed over the past 5 years. There are no abnormal findings on physical examination. Laparoscopic examination shows numerous hemorrhagic 0.2- to 0.5-cm lesions over the peritoneal surfaces of the uterus and ovaries. Which of the following ovarian lesions is most likely to be associated with her findings?
- A. Fibroma
 - B. Brenner tumor
 - C. Endometriotic cyst
 - D. Krukenberg tumor
 - E. Metastatic choriocarcinoma
 - F. Mucinous cystadenocarcinoma
8. A 53-year-old woman whose last menstrual period was 3 years ago notes vaginal bleeding for a week. On physical examination, her uterus is markedly enlarged, but there are no adnexal masses. CT imaging reveals an irregular 8-cm mass in the body of the uterus. A total abdominal hysterectomy is performed, and microscopic examination of the soft, hemorrhagic mass shows spindle cells with atypia and numerous mitoses. There is coagulative necrosis of tumor cells. Which of the following is the most likely cell of origin for this mass?
- A. Cytotrophoblastic cells
 - B. Endometrial glandular cells
 - C. Germ cells
 - D. Smooth muscle cells
 - E. Squamous epithelial cells

9. A 22-year-old woman experiences sudden onset of severe lower abdominal pain. Physical examination shows no masses, but there is severe tenderness in the right lower quadrant. A pelvic examination shows no lesions of the cervix or vagina. Bowel sounds are detected. An abdominal ultrasound scan shows a 4-cm focal enlargement of the proximal right fallopian tube. A dilation and curettage procedure shows only decidua from the endometrial cavity. Which of the following laboratory findings is most likely to be reported for this patient?
- A. Cervical culture positive for *Neisseria gonorrhoeae*
 - B. Detection of human chorionic gonadotropin in serum
 - C. 69,XXY karyotype on decidual tissue cells
 - D. Pap smear showing pseudohyphae of *Candida*
 - E. Positive result of serologic testing for syphilis
10. A 34-year-old woman has noticed a bloody discharge from the nipple of her left breast for the past 3 days. On physical examination, the skin of the breasts appears normal, and no masses are palpable. There is no axillary lymphadenopathy. She has regular menstrual cycles and is using oral contraceptives. Excisional biopsy is most likely to show which of the following lesions in her left breast?
- A. Acute mastitis
 - B. Fibroadenoma
 - C. Intraductal papilloma
 - D. Phyllodes tumor
 - E. Sclerosing adenosis
11. A 25-year-old Jewish woman sees her physician after finding a lump in her right breast. On physical examination, a 2-cm, firm, nonmovable mass is palpated in the upper outer quadrant. No overlying skin lesions and no axillary lymphadenopathy are present. The figure shows an excisional biopsy specimen. The family history indicates that the patient's mother, maternal aunt, and maternal grandmother have had similar lesions. Her 18-year-old sister has asked a physician to determine whether she is genetically at risk of developing a similar disease. A mutated gene encoding for which of the following is most likely to be found in her sister?
- A. *BRCA1*
 - B. Estrogen receptor (*ER*)
 - C. *HER2/neu*
 - D. *TP53*
 - E. Progesterone receptor (*PR*)
 - F. *RBI*
12. A study of gene expression profiling involving breast biopsies showing invasive carcinoma of no specific type (NST) is performed. A subset of these cases, comprising about 15% of all cases, has the following characteristics: estrogen receptor (ER) and progesterone receptor (PR) negative, HER2/neu negative, basal keratin positive, flow cytometry showing aneuploidy and high proliferation rate, and association with BRCA1 mutations. Which of the following therapies is most likely to be effective in women with this subset of NST breast cancer?
- A. Chemotherapy
 - B. Radiation
 - C. Surgery alone
 - D. Tamoxifen
 - E. Trastuzumab

Answers:

- C.** Dendritic cells are a form of antigen-presenting cell. Dendritic cells in epithelia are known as *Langerhans cells*, and those within germinal centers are called *follicular dendritic cells (FDCs)*. The FDCs may become infected but not killed by HIV. They have cell surface Fc receptors that capture antibody-coated HIV virions through the Fc portion of the antibody. These virions attached to the FDCs can infect passing CD4⁺ lymphocytes. Dendritic cells elaborate type I interferons that up-regulate antiviral proteins in neighboring cells. B cells are a component of humoral immunity, and antibody to HIV does not serve a protective function, but allows serologic detection of infection. CD8⁺ cells are cytotoxic lymphocytes that lack the receptor necessary for infection by HIV. Because they survive selectively, the CD4⁺:CD8⁺ ratio is reversed so that it is typically less than 1 with advanced HIV infection. Innate lymphoid cells resemble NK cells, but shape further lymphoid reactions. Langerhans giant cells are “committees” of activated macrophages that are part of a granulomatous response. Macrophages are a type of antigen-presenting cell that can become infected by HIV without destruction. Mast cells have surface-bound IgE, which can be cross-linked by antigens (allergens) to cause degranulation and release of vasoactive amines, such as histamine, as part of anaphylaxis with type I hypersensitivity.
- C.** Bladder hypertrophy can result from outlet obstruction. In an older man, this type of obstruction is most often caused by prostatic enlargement caused by hyperplasia or carcinoma. Mild elevations in the prostate-specific antigen (PSA) level may occur in patients with prostatic hyperplasia, and greater increases in PSA suggest carcinoma. Autoimmune conditions may be associated with interstitial cystitis, but cystitis does not cause bladder neck obstruction. Polycythemia can be the result of a paraneoplastic syndrome, but urothelial malignancies are unlikely to produce this finding; renal cell carcinoma is a more likely cause. Schistosomiasis leads to chronic inflammation and scarring. Bladder outlet obstruction can increase the risk of infection, typically with bacterial organisms such as *Escherichia coli*, not *Mycobacterium tuberculosis*.
- B.** Genital candidiasis can occur in individuals without underlying illnesses, but it is far more common in individuals with diabetes mellitus. Warm, moist conditions at these sites favor fungal growth. Scabies mites are more likely to be found in linear burrows in epidermis scraped from the extremities. Neoplasms with atypical cells may ulcerate, but such lesions are unlikely to be shallow or multiple without a mass lesion present. Intranuclear inclusions suggest a viral infection; however, diabetes is not a risk factor for genital viral infections. These lesions are too large and numerous to be syphilitic chancres.
- E.** Although a modest elevation of the human chorionic gonadotropin (hCG) concentration can occur when a seminoma contains some syncytial giant cells, significant elevation of the α -fetoprotein (AFP) level never occurs with pure seminomas. Elevated levels of AFP and hCG effectively exclude the diagnosis of a pure seminoma and indicate the presence of a nonseminomatous tumor of the mixed type. The most common form of testicular neoplasm combines multiple elements; the term *teratocarcinoma* is sometimes used to describe tumors with elements of teratoma, embryonal carcinoma, and yolk sac tumor. The yolk sac element explains the high AFP level. Mixed tumors may include seminoma. Choriocarcinomas secrete high levels of hCG, but no AFP. It is unusual for a tumor to metastasize to the testis; this patient is of an age at which a primary cancer of the testis should be considered when a testicular mass is present. Lymphomas may involve the testis, usually when there is systemic involvement by a high-grade lesion. Prostatic adenocarcinoma and lymphomas do not elaborate hormones. Leydig cell tumors are non-germ cell tumors derived from the interstitial (Leydig) cells; they may elaborate androgens.

5. **E.** Yolk sac tumors are typically seen in boys younger than 3 years. The primitive glomeruloid structures are known as *Schiller-Duval bodies*. The cells are strongly positive for AFP. Embryonal carcinomas with yolk sac cells contain AFP, but they are seen in adults. They are composed of cords and sheets of primitive cells. Choriocarcinomas contain large, hyperchromatic, syncytiotrophoblastic cells. Seminomas have sheets and nests of cells resembling primitive germ cells, often with an intervening lymphoid stroma. Leydig cell tumors act in a benign fashion and may produce androgens or estrogens or both. Teratomas contain elements of mature cartilage; bone; or other endodermal, mesodermal, or ectodermal structures.
6. **B.** The inflammatory cells in the cervical discharge with redness (erythema), and the biopsy findings indicate that the patient has cervicitis. *Chlamydia trachomatis* is the most common cause of cervicitis in sexually active women. Candidiasis, gonorrhea, and trichomoniasis also are common. Candidiasis often produces a scant, white, curdlike vaginal discharge; gonorrhea may have an associated urethritis; and *Trichomonas* may produce a profuse homogeneous, frothy, and adherent yellow or green vaginal discharge. *Gardnerella* is found in bacterial vaginosis, a common condition caused by overgrowth of bacteria. *Gardnerella* infection produces a moderate, homogeneous, low-viscosity, adherent vaginal discharge that is white or gray and has a characteristic fishy odor; clue cells are seen on a wet mount. Herpetic infections are more likely to manifest as clear vesicles on the skin in the perineal region. Infection with human papillomavirus is associated with condylomata, dysplasias, and carcinoma.
7. **C.** Endometriosis is a condition in which functional endometrial glands are found outside the uterus. Common sites include ovaries, uterine ligaments, rectovaginal septum, and pelvic peritoneum. These endometrial glands can respond to ovarian hormones so that cyclic abdominal pain coincides with menstruation. Recurrent hemorrhages may incite scarring and the formation of fibrous adhesions in the pelvic region. This may cause distortion of the ovaries and fallopian tubes and may lead to infertility. One common variation is formation of an endometrioma, or chocolate cyst, which represents a focus of endometriosis that becomes an expanding cystic lesion as its center becomes filled with chocolate-brown sludge from the recurrent hemorrhage. The remaining choices are not associated with endometriosis, although endometrioid tumors may form in foci of endometriosis.
8. **D.** Leiomyosarcomas arising in the uterine corpus account for about 5% of all GYN malignancies, and is most often present in postmenopausal women. The cellular atypia, coagulative necrosis, and numerous mitoses distinguish this neoplasm from the much more common leiomyoma (which does not give rise to leiomyosarcoma), both derived from smooth muscle. Anaplastic cytotrophoblasts are seen with choriocarcinomas. Cross striations are seen with rhabdomyosarcomas. Adenocarcinomas arise from glandular epithelium. Germ cells give rise to ovarian tumors such as teratoma and dysgerminoma. Squamous carcinomas are much more common but arise in the cervical portion of the uterus.
9. **B.** Conditions predisposing to ectopic pregnancy include chronic salpingitis (which may be caused by gonorrhea, but a culture would be positive only with acute infection), intrauterine tumors, and endometriosis. In about half of cases, there is no identifiable cause. Gestational trophoblastic disease associated with a triploid karyotype with partial mole developing outside the uterus is rare. *Candida* produces cervicitis and vaginitis and is rarely invasive or extensive in immunocompetent patients. Syphilis is not likely to produce a tubal mass with acute symptoms (a gumma is a rare finding).
10. **C.** Intraductal papillomas are usually solitary and smaller than 1 cm. They are located in large lactiferous sinuses or large ducts, and have a tendency to bleed, though they are benign. Abscesses complicating mastitis organize with a fibrous wall. Fibroadenomas contain ducts with stroma and are not highly vascular; these lesions are not located in ducts. Phyllodes tumors also arise from intralobular stroma and can be malignant, but they do not invade ducts to cause bleeding. Sclerosing adenosis, a lesion occurring with fibrocystic changes, has abundant collagen, not vascularity.

11. A. The biopsy specimen shows an invasive breast cancer. Given the young age of the patient and the strong family history of breast cancer, it is reasonable to assume that she has inherited an altered gene that predisposes to breast cancer. There are two known breast cancer susceptibility genes: *BRCA1* and *BRCA2*. Both are cancer suppressor genes. Specific mutations of *BRCA1* are common in some ethnic groups, such as Ashkenazi Jews. Estrogen receptors are expressed in 50% to 75% of breast cancers. Their presence bodes well for therapy with hormone receptor antagonists. There is no known relationship between the structure of the estrogen receptor gene and susceptibility to breast cancer. Likewise, presence of progesterone receptors in the cancer cells indicates potential response to hormonal therapy, not risk for breast cancer. *HER2/neu* is a growth factor receptor gene that is amplified in certain breast cancers and is a marker of poor prognosis, not susceptibility. There is alteration of *TP53* in many cancers, typically acquired and not familial, including breast carcinomas, but it does not have predictive value for risk. Inheritance of *RBI* mutations increases the risk for retinoblastoma and osteosarcomas, but not breast carcinomas.

12. A. This is the basal-like subset of NST breast cancers that is triple negative for the usual immunohistochemical markers. Hence, lack of ER positivity predicts that antihormonal therapy with tamoxifen will not be of benefit, and lack of HER2/neu indicates that trastuzumab will be ineffective. The basal-like cancers are highly aggressive and tend to metastasize early, so containment with surgery or radiation is unlikely. However, some of them are cured by chemotherapy. This emphasizes the importance of gene expression profiling, so that treatment is individualized to each cancer patient for the best chance of success.