



Team SAQ

1st case:

- ▶ **A 23 years old man came to the ER complaining from his leg, which produces gas bubbles, bad smell and it become black and decomposing. He also reports that he fell down when he was racing with his friend on the beach causing a wound on his leg that he did not treated.**

1st case:

Q1: What is Diagnosis?

Gas Gangrene (Wet Gangrene)

Q2: how can we treat him?

The Limb Has To Be Amputated

Q3: which organisms cause his illness?

C. Perfringens (Anaerobic Gram Positive Bacilli)

Q4: determined his symptoms?

Gas Bubbles, Bad Smell And It Become Black And Decomposing

Q5: is it congenital or acquired?

Acquired

Q6: This disease affect which parts of the body?

The lower limbs

Q7: determined one of the most common risk factor ?

Diabetes Mellitus

2nd case:

- ▶ **A man and his wife went to an ob-gyn. They were complaining that they can't have children. The doctor tested them and the result showed that the man was infertile. The doctor made further investigations and found that the man had chronic respiratory tract infection since he was born.**

2nd case:

**Q1: Possible diagnosis:
Immotile cilia syndrome.**

**Q2: Symptoms:
Infertility in males.**

Chronic respiratory tract infections in both males and females.

**Q3: Cause:
Immobility of Cilia and Flagella which is cause by deficiency in
Dynein.**

**Q4: What is Dynein?
It is the protein responsible for movements of Cilia and Flagella.**

3rd case:

- ▶ **45 year old man, came to the hospital complaining of productive cough and dyspnea (shortness of breath), he told the doctor that he had fever since 1 month and when he took a medicine it goes and comes back, after asking him a few questions the doctor knew that he was in a village in north America before 50 day, bronchoscopy with transbronchial biopsy: showed granuloma containing fungus, the doctor decided to give him antifungal which damage the fungal cell membrane**

3rd case:

Q1: what is the possible diagnosis?

granulomatous mycosis

Q2: which type of fungi cause the granuloma ?

primary pathogens

because primary pathogens cause respiratory diseases and it geographically restricted in north and south America

Q3: which labs you will use to identify this fungi?

histology or microbiology

Q4: mention two name of fungi that cause this type of granuloma.

1- Histoplasma spp.

2- Blastomyces spp.

Q5: what is the antifungal agent ?

polyenes or azole

- ▶ *the student should know that is mycoses even if it's not mentioned in the question because of (respiratory disease and the geographically restricted in north and south America).
- ▶ *If there is no mention for granuloma, the answer for the 4th question could be any primary pathogens.

4th case:

- ▶ **A 34 year old man came to the hospital, he had a diabetes and he did solid organ transplantation, his CBC (complete blood count) are abnormal and lab results are found some yeast (candida spp) in his body , the doctor knew that drug killed these organisms and he gave him ketoconazole to destroy the cell wall of organisms.**

4th case:

Q1: What is the infections types ?

Mycosse fungi infection. (opportunistic fungi infection- normal flora).

Q2: What are the factors that made the invasion easier for the fungus? and what do we could this type of patient ?

- **Diabetes**
- **Solid organs transplantation**
- **disease in immunocompromised host.**

Q3: What are the labs investigations?

- **histopathology**
- **Microbiology**

Q4: How can the doctor treat the infection?

- **used antifungal agent**
- **(azole) because azole used to destroy the cell membrane in fungi** ⁹

5th case:

▶ **A 10-year-old girl with severe neutropenia a 1 month after bone marrow transplantation develops fever and difficulty in breathing. A chest radiograph suggests pulmonary infarcts. At autopsy, pulmonary vessels are occluded by abundant growth of microorganism.**

5th case:

Q1: what is the possible diagnosis?

Opportunistic fungal infection.

Q2:

Clinical features : (History, risk factors , etc)

Imaging: Good value in diagnosis and therapy monitoring.

Radiographs and clinical history may strongly suggest: Aspergillosis.

Q3: Information about the disease :

- 1- It occur in immunocompromised host (الأشخاص منقوصي المناعة).**
- 2- Many fungal are opportunists and are usually not pathogenic but, if the immune system is weak will be pathogenic and cause infection.**
- 3- Opportunistic fungal infection is a type from the fungal infections (Mycoses)**

5th case:

Q1: Which patients could be immunocompromised ? or what are the risk factors that cause immunocompromised?

HIV / AIDS

Hematopoietic stem cells.

Transplant (HSCT)

Solid organs transplantation. (Like bone marrow in our case)

Malignancies or cancers.

Neutropenias (Like in our case)

Diabetes.

What are fungal infections (Mycoses) types?

Superficial mycoses.

Cutaneous mycoses.

Subcutaneous mycoses.

Systemic mycoses.

Opportunistic mycoses.

5th case: Write some examples about opportunistic fungi:

***NORMAL FLORA:**

Candida spp.

Other yeast.

***UBIQUITOUS IN OUR ENVIROMENT:**

Aspergillus spp.

Zygomycetes spp.

Cryptococcus spp.

In our case there is pulmonary Cryptococcosis.

How it is characterized?

By tissue necrosis.

Hemorrhage.

Vascular occlusion.

Little or no inflammatory response.

5th case:

- What is the treatment?

We can treat it by using antifungal

Targets for antifungal agents?

Cell membrane

Cell wall

DNA/RNA synthesis

6th case:

- ▶ **A is a 39-year-old male patient married with three kids work in a bank presented to the er with a history of chest pain, shortness of breath associated with cough with sputum for five days and night sweat . A doctor ordered a blood test ,chest x-ray and a sputum culture and stain. The results was positive with mycobacterium and acid fast bacilli**

6th case:

Q1: The patient is most likely to have?

tuberculosis

Q2: caused by? And What is the name of the stain used to identify it?

- **caused by a bacterium called Mycobacterium tuberculosis.**

- **Ziehl Neelsen Stain (Acid fast stain)**

Q3: If we take a biopsy , under the microscope we will see?

The microscopic shows a granulomatous tissue with caseous necrosis

Q4: If we took an X-ray of the lung what will you find?

A coin shaped lesion (granuloma)

Q5: if we took a WBC count what type(s) of the WBC would be found in large amounts in the blood?

1- macrophage 2- lymphocytes

6th case:

Q6: Treatment ?

Isoniazid Anti-TB

Q7:Prevention?

- Pasteurization of milk To prevent diseases like Tuberculosis

-U.V. light Has limited sterilizing power because of poor penetration into most materials. Generally used in irradiation of air in certain areas such as tuberculosis labs.

if the patient takes several antibiotics for a long time to treat the disease, what type of inflammation could develop during his treatment?

Pseudomembranous Colitis

7th case:

- ▶ A 35 years old woman came to a gynecologist complaining from dysmenorrhea (عسر الطمث) also a chronic pelvic pain, pain in lower back (for a long period of time) suspected carcinoma in cervix ,cervical biopsy (pap smear) (مسحة عنق الرحم) shows replacement of columnar cells by squamous in squamocolumnar junction.

7th case:

Q1: Diagnosis?

Cervix Squamous metaplasia

Q2: Risk factors?

Squamous cell carcinoma arises from squamous metaplasia in cervix

8th case:

- ▶ **A 40 years smoker complains from difficulties in breathing ,test shows a replacement of the bronchial columnar epithelium by a squamous**

8th case:

Q1:Diagnosis?

Sqamous metaplasia

Q2:Risk factors?

**If causative agent persist it may predispose to malignant(cancer)
transformation**

9th case:

- **25 years old patient complains from chronic reflux, microscope show(esophagus shows a columnar epithelium instead of squamous**

9th case:

Diagnosis:

Barrett's esophagus(columnar metaplasia)

What is this disease associated with?

chronic gastro-esophageal reflux

Risk factor :

Devolpment of adenocarcinoma of esophagus

10th case:

- **A 66 years old man with a history of hypertension, he came to the ER with severe chest pain. Unfortunately, the patient could not survive. A pathologist performed an autopsy and his report stated that the patient died from myocardial infarction.**

10th case:

Q1: what is the involved organ in this condition?

Heart

Q2: what is the pathogenesis of myocardial infraction?

Hypoxia caused by ischemia

Q3: what is the type of cell injury?

Coagulative necrosis

Q4: is it reversible or irreversible cell injury?

Irreversible

Q5: what is the adaptation mechanism of the organ with hypertension?

Hypertrophy

Q6: what is the morphology of the disease?

The architecture is preserved, we also find karyolysis and karyorrhexis of the nuclei

10th case:

Q7: what is autopsy?

Examining a patient after death to know the cause of death

Q8: a double sac of serous membrane that encloses the organ is?

Pericardium

Q9: the muscle that surrounds the organ?

Cardiac muscle

11th case:

- **A 6 year old boy was playing in the street in the 'Eid night, then he had an accident and he injured his leg. The boy stopped playing because of the pain, and his parents noticed that his leg was red and warm. The boy was taken to ER and the doctor believed that his leg was inflamed. The doctor took an aspirate from the inflamed area, and the result show high levels fibrinogen.**

11th case:

Q1: What type of inflammation does the boy have?

FIBRINOUS INFLAMMATION

Q2: Morphology of this type of the inflammation?

it appears as an **Eosinophilic meshwork of threads or sometimes as an amorphous coagulum.**

Q3: What type of drugs we should use to reduce the inflammation?

Non-steroidal anti-inflammatory drugs like Aspirin

Q4: What is the possible outcome for this type of the inflammation?

(1) Resolution 2) Organization

Q5: example site for Inflammation?

Pericardium

Q6: briefly explain how the fibrinogen is accumulated?

the damage of the endothelial cells increases vascular permeability

11th case:

Q7: what is the process that eliminates the fibrinogen?

Fibrinolysis

Q8: give one difference between exudates and transudates?

Transudates has low concentration of protein, Exudates has high concentration of protein

Q9: give two chemical mediators that contribute vascular permeability

Histamine, and serotonin

Q10: name an organism that may cause the disease

Streptococcus pneumonias, or Corynbacterium diphtherias

12th case:

- **A patient went to the hospital, and he had a tumor around the gluteus Maximus. The doctor took a biopsy to examine the tumor; the doctor was relieved to find out that the tumor was benign.**

12th case:

Q1: what is the medical term for the following tumor

rhabdomyoma

Q2: What is the rate of growth of benign tumor?

Slow growth

Q3: name the factors that affect the growth of the tumor?

It affected by blood supply, hormonal effects, and location.

Q4: does the tumor invade other cells?

Q5: Some benign tumor example:

Q6: what does Benign epithelial neoplasms produce?

13th case:

- **A 60 year old men , has an atrophic gastritis (inflammation of the stomach mucosa leading to destruction of gastric parietal cells). He suffers from weight loss, fatigue, weakness, diarrhea and glossitis (swollen, red and smooth appearance of the tongue).**

13th case:

What type of anemia he has ?

Pernicious Anemia (type of megaloblastic anemia)

What are the major causes behind this type of anemia ?

Deficiency of vitamin B12 that must be obtained from food (cannot be produced by the body) and poor absorption of this vitamin due to intestinal disease. Intestinal disease can lead to loss of gastric parietal cells that are responsible for secretion of a protein called intrinsic factor that must bound to vitamin B12 to be able to absorb in the terminal ileum.

14th case:

A 35 year old woman who lives in high altitudes, has prolonged heart and lung disease. She notices abnormal symptoms such as reddened face, excessive bleeding, itching, joint pain, headache and fatigue. Therefore, she did a test which results in :

Hematocrit (HCT or Packed cell volume “PCV” which expressed the volume of red blood cells) = 55 %

Hemoglobin level = 18.5 g/dL and increased count of Reticulocytes in circulation.

14th case:

What is her diagnosis ? Explain your answer.

Her diagnosis is **Polycythemia**. That's because of higher levels of HCT and hemoglobin :

Normal range of HCT in females is (38% to 46%) and normal range of Hb is (14-16 g/dl). So, she has increased number of Red blood cells which results in this disease.

What are the causes that result in Polycythemia ?

High altitude dwellers, patients with chronic respiratory or cardiac diseases are more susceptible to have Polycythemia. Kidney secretes large amounts of Erythropoietin in response to Hypoxia (low oxygen in blood and tissues) in order to increase oxygen carrying-capacity.

14th case:

How many types of polycythemia there are?

There are two types :

Primary : which called (Polycythemia Rubra Vera – PRV) :

(uncontrolled production of Red blood cells) caused by genetic aberration in red blood cells production, in other words “Unknown reason”.

Secondary polycythemia : Whenever the tissues become hypoxic because of high altitudes or cardiac failure

red blood cells will be produced in large quantities.

(Occurs in natives who live in high altitudes “Physiologic polycythemia “)

15th case:

A pregnant woman with symptoms of fatigue, weakness, lightheadedness, loss of appetite, and fast heartbeat went to the hospital with her 17 year old daughter. Her gynecologist asked her to do a test (CBC “complete blood count”) and Red blood cell folate level to determine the problem.

The result was :

Decreased Red blood cells and Hemoglobin levels

Hyper segmented Neutrophils

MCV>95 fl (Mean Corpuscular volume)

Very low levels of Folic acid & Vitamin B12.

15th case:

What is her diagnosis ?

According to the result, it is obvious that she has (Anemia) because of decreased RBCs , decreased hemoglobin.

What types of Anemia does she have?

She has (Macrocytic anemia) why? We mentioned that (MCV>95 fl) while the normal range is (78 to 94 fl) so the RBCs are larger than normal (as large as lymphocytes). In addition, there are Hyper segmented Neutrophils which is a prominent feature of Macrocytic anemia.

(Fewer RBCs, Decreased Hb , Increased MCV, Hyper segmented Neutrophils)

What are the major causes behind Macrocytic (or megaloblastic) anemia ?

The woman is pregnant so, she must take folic acid during her pregnancy to prevent defects in the fetus. Deficiency of folic acid leads to failure of nuclear maturation & division.

, her daughter felt tired and collapsed , the doctor statin examining her and asked for CBC. The result was :

Decreased Red blood cells and Hemoglobin levels

MCV = 62 femtoliter

Hypochromic and pale RBCs.

What is her diagnosis ?

Since the RBCs & Hb are decreased then she has anemia. The MCV result was 62 while the normal range is (73 – 90 fl) > “ smaller than normal “

so, she has Microcytic anemia.

What are the causes of microcytic anemia ?

The major and the most important cause is Iron deficiency.

16th case:

- ▶ **A 66-year old male patient came to the ER with Chest pain described as a pressure sensation , after further investigation , his blood results showed an abnormalities in the Myoglobin enzyme and Uric acid , higher than normal , he is diabetic and he had a repetitive history of ischemia in multiple areas of his body .**

16th case:

In which organ , system does this disease appear ?

The heart , cardiovascular system .

what is the most appropriate disease that describes these symptoms ?

Myocardial infarction

In which way do ischemia and this disease relate ?

One of the consequences of ischemia (loss of blood supply) is myocardial infarction .

17th case:

- ▶ **A 24 year old female patient came to the clinic with yellow sclera and skin , suffered from anemia for long time , and has some abnormalities in her liver function .**

17th case:

What is the most likely disease ?

Jaundice

Which type of anemia does the patient suffer from ? why ?

It is hemolytic anemia , because when the RBCs are broken down the heme (porphyrin) which gives the RBCs its color , turns into bilirubin , which gives the yellow color to the skin , sclera when its in abnormal quantities in the blood .

18th case:

- ▶ **A 21 year old man visited a dentist to extract a tooth. After this dental procedure he had excessive bleeding which persisted for 3 days.**

18th case:

Why is he bleeding too much ? what do you think his diagnosis is ?

Since he has excessive bleeding for a long period of time, that's mean he has a disorder affecting his clotting system . Hemophilia is X-linked disorder that mostly affects males “ and rarely affects females”. Hemophilia patient have a little or no clot factors that help to stop bleeding.

How many types of hemophilia do we know? What are the causes ?

Hemophilia A > Deficiency of clotting factor VIII (8)

Hemophilia B > Deficiency of clotting factor IX (9).

19th case:

25 year old men has been diagnosed with Typhoid fever.

(Typhoid fever Symptoms are : severe intestinal hemorrhage, malaise and diffuse abdominal pain). His CBC result shows :

White blood cells count = 2500 per cubic millimeter.

According to the result above, there is abnormality in white blood cells count. What is the name of this condition ?

The normal range is between 4000-11000. Since he has only 2500, it indicates lower count of WBCs. Therefore, we can say that he has Leukopenia.

What are the major causes behind Leukopenia ?

- 1- Typhoid fever.
- 2- Drugs.
- 3- Malnutrition.
- 4- Radiation.
- 5- B12 & folic acid deficiency.

There are another condition that opposes Leukopenia. What does it called ? explain its causes.

Leukocytosis (increased in WBCs count, above 11000)

It may be due to :

Physiological causes :

After physical exercise, Adrenaline injection and stress.

Disease :

- **Bacterial infection (tonsillitis , Appendicitis)**
- **Worm infection**

20th case:

A patient went to the hospital, and he had a tumor around the gluteus Maximus. The doctor took a biopsy to examine the tumor; the doctor was relieved to find out that the tumor was benign.

20th case:

Q1: what is the medical term for the following tumor

rhabdomyoma

Q2: What is the rate of growth of benign tumor?

Slow growth

Q3: name the factors that affect the growth of the tumor?

It affected by blood supply, hormonal effects, and location.

Q4: does the tumor invade other cells?

No they do not invade, it remains localized

Q5: Some benign tumor example:

A benign tumor arising in fibrous tissue is called a fibroma

A benign cartilaginous tumor is a chondroma

20th case:

Q6: what does Benign epithelial neoplasms produce?

They produce microscopically or macroscopically visible finger-like or warty projections from epithelial surfaces are referred to as papillomas.

Q7: what is Polyp?

A mass that project above a mucosal surface forming a macroscopically visible structure.

Q8: Except for (epithelial benign tumors) the tumor is classified based on what?

The cell of origin, and Macroscopic pattern.

Q9: give some Examples of benign epithelial neoplasms?

-- Respiratory airways: Bronchial adenoma.

- Renal epithelium: Renal tubular adenoma.

- Liver cell: Liver cell adenoma.

- Squamous epithelium: squamous papilloma

Q10: When the doctor looks at the biopsy under the microscope, what do you expect he will find?

The doctor will find well-differentiated cells

21st case:

A patient was admitted to the hospital, and he was complaining about over accumulation of mucus in the respiratory passage. When the doctor took the medical history he realized that the patient was a heavy smoker. The doctor took a sample from the trachea, and examined it under the microscope. He found squamous epithelium covering the trachea?

21st case:

Q1- Which cellular adaptation is exhibited in the condition?

Metaplasia

Q2- normally, the trachea is surrounded with which type of epithelium?

Pseudo-Stratified Columnar ciliated with goblet cells

Q3- briefly explain why the mucus was accumulated in this condition? **The lose of cilia helped the mucus to persist**

Q4- Describe the morphology of squamous epithelium under the microscope?

Flat cells with flat nuclei

Q5- name one other organ that could undergo the same cellular adaptation?

Esophagus, or uterine cervix

Q6- This condition is normally reversible or irreversible?

Reversible

Q7- In general, what is causes this condition?

Chronic irritations that induces mutations

22nd case:

40-year-old woman visited a doctor and she had a breast lump. The doctor was worried given her age that the lump resulted from a malignant tumor (cancer). He took an aspirate from the lump and examined it under the microscope. The doctor observed some fat cells that lacked nuclei. The doctor was relieved to find out that the lump did not result from a malignant tumor, instead from a cell injury

22nd case:

Q1- What is the cell injury?

Fat necrosis

Q2- What is the laboratory technique used to examine the breast lump?

Fine-needle cytology

Q3- knowing the cause of Lump, what you also expect to find under the microscope?

Calcium deposits (saponification)

Q4- What could be the cause of the injury?

Trauma

Q5- if we took a blood sample, one enzyme must be in high concentration.
Name the enzyme?

Lipase

22nd case:

Q6: if the breast lump resulted from a malignant tumor, what would the doctor find under the microscope?

Polymorphic cells, hyper chromatic nuclei, a lot of mitosis

Q7: give two characteristics of malignant tumors

Metastasis, high rate of growth

Q8: the nomenclature and biologic behaviors of tumors is based on what?

Parenchyma

Q9: Malignant tumors arising from endothelial germ layer are called?

Carcinoma

Q10: What is the process in which the tumor (in the woman's breast) could invade different tissues?

Metastasis

23rd case:

A young boy was wearing tight and uncomfortable shoes.

When he took off his shoes he found a white mass protruding from his skin

(Skin blister). The boy was playing with this area until it burst, and fluid came out.

23rd case:

1 What is the type of inflammation

Serous inflammation

2-briefly describe this type of inflammation

The outpouring of watery, relatively protein-poor fluid.

3-the skin blister resulting from what?

Burns or viral infection.

4-fluids from the inflammation is derived from where?

From the plasma or from the secretions of mesothelial cells (skin).

5- where does the fluid usually accumulate?

Within or immediately beneath the epidermis.

24th case:

Mohammed went the doctor, and he is complaining about a pain in his knee joint. Moreover, the doctor noticed redness in the skin that covered knee joint, so he concluded that it was inflamed. The doctor opened the skin and applied some force, and a yellow liquid came out.

24th case:

Q1- what is the type of inflammation?

suppurative (purulent) inflammation

Q2- what do we call the yellow liquid?

Pus

Q3- what does the liquid normally contain?

Neutrophils, and necrotic cells

Q4- name the class of bacteria that induces the accumulation of the fluid?

Staphylococci (S. aureus)

24th case:

Q5- Define Abscess?

Focal collection of pus

Q6- which chemical mediator probably caused the pain?

Prostaglandins

Q7- briefly explain why the skin turned red, and name two chemical mediators that played a role in this phenomena?

Vasodilation increases the blood flow to the skin. Histamine and prostaglandins

Q8: in the following scenario, name the sign and the symptom

Signs: redness in the skin

Symptoms: pain in the knee joint

25th case:

**a 50 year old woman, from Africa, she came with severe headache, and six months ago she developed chest pain with difficult breathing, abdominal pain with loose stools.
Doctor diagnosed her with Hepatitis B**

25th case:

1- What type of inflammations Coincides with this disease?

Both chronic and acute

2- name the micro organism that cause Hepatitis B?

Hepatitis B Virus

3- types of cells will be present in the chronic case of hepatitis B?

Macrophages, and lymphocytes

4- what is the major affected organ with Hepatitis B?

Liver

5- dose geographic distribution has an impact on the incidence of the disease?

Yes, because in Africa the disease is more prevalent than other countries like (Eastern Europe)

6- briefly explain how the virus could cause malignant tumor?

The virus causes hepatic damage that stimulates proliferation and DNA damage (mutation)

26th case:

35-year-old man had an appointment with an orthopedic. The doctor noticed that half his foot was black in color. The doctor touched the area, but the patient could not feel the doctor's hand. The doctor took a sample from the injured region and sent it to the lab. The lab results show no evidence of bacterial infection.

25th case:

Q1: what is the diagnosis?

Dry gangrene

Q2: the main cause of the disease?

Ischemia

Q3: name one complication that helps develop the following disease?

Diabetes Mellitus or Atherosclerosis

Q4: The lab mentioned in the question belongs to which department of pathology?

Microbiology

Q5: what is the treatment?

surgery (Amputation)

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