Cardiovascular Pathology

1) A 39-year old female of Chinese descent presents to her family physician with malaise, fever, arm pain, loss of appetite, and blurred vision. Physical examination reveals diminished pulsation and low BP on the upper extremities; pulses and BP pressure on the lower extremities are within normal limits (WNL). Which of the following morphologic changes are most likely to be found within the affected arteries?

a) Segmental necrotizing inflammation
b) Necrotizing inflammation with thrombosis and abscess formation
c) Necrotizing inflammation with eosinophilia
d) Granulomatous inflammation and AFBs
e) Granulomatous inflammation and treponemas
f) Granulomatous inflammation

2) A 21-year-old apparently healthy Caucasian female complains to her physician that her fingers and hands undergo dramatic color changes from white to blue to red when she gets cold or upset. Physical findings are WNL. Which of the following is the most likely diagnosis?

a) Systemic sclerosis
b) CREST
c) SLE
d) Raynaud disease
e) Secondary Raynaud phenomenon
3) A 63-year-old hypertensive Caucasian male experiences severe “tearing” chest pain, which migrates from his upper back to mid-back over the period of an hour. Which of the following morphologic changes are most likely to be found within the patient’s aorta?

a) Focal mononuclear infiltration and intimal “tree-barking”
b) Granulomatous inflammation
c) Cystic medial degeneration
d) Concentric atherosclerotic plaques
e) Amyloid deposits
f) Fibrinoid necrosis

4) A 54-year-old African American male is found dead in his house. Autopsy reveals hemopericardium due to acute myocardial infarction and left ventricular wall rupture. For how long time had the patient experienced myocardial infarction before he expired?

a) < 1 day
b) 1 – 3 days
c) 4 – 7 days
d) 7 – 14 days
e) 14 – 28 days
5) A fourteen-month-old Caucasian baby girl develops cardiac failure and dies two months later. At autopsy, the heart does not have any obvious congenital defects, but the heart chambers are small and covered with thick white endocardium. Histologic examination of the postmortem material reveals regular elastic fibers embedded in the thickened fibrous endocardium. Which of the following is the most likely diagnosis?

a) Kawasaki disease
b) Emomycardial fibrosis
c) Lofler endocarditis
d) Endocardial fibroelastosis
e) Cardiac amyloidosis

6) A 53-year-old Indian female with a history of rheumatic fever presents to the outpatient clinic with dyspnea, fatigue, lower leg edema, dry cough with scanty amount of rusty sputum, and abdominal distension. Physical examination reveals cyanosis, pedal edema, ascites, and rales in the both lower lung field. A chest X-ray reveals left atrial enlargement and pulmonary edema. Which of the following is the most likely type of heart failure seen in this patient?

a) Acute LSHF
b) Chronic LSHF
c) Acute RSHF
d) Chronic RSHF
e) Chronic biventricular HF
7) Clinical scenario from question 6. Which of the following is the most likely mechanism of heart failure in this patient?

a) Reduced preload
b) Pressure overload
c) Volume overload
d) Impaired contractility
e) Elevated preload

8) A 28-year-old Hispanic female is brought to the emergency room with shortness of breath and heart palpitations. Her past medical history is significant for ventricular septal defect (VSD). Physical examination reveals cyanosis, pitting edema of the lower legs, distended jugular veins, and hepatosplenomegaly. Heart examination reveals a harsh holosystolic murmur and thrill at the left sternal border. Which of the following VSD complications has most likely developed in this patient?

a) Atrial fibrillation
b) Ventricular fibrillation
c) Myocardial infarction
d) Eisenmenger syndrome
e) Dissecting aortic aneurysm

9) A 58-year-old Caucasian male presents to the outpatient clinic with reddish-blue lesions on his lower extremities, fever, muscle pain, and weight loss. He reports a history of acute viral hepatitis B three months ago. Physical examination reveals multiple moderately tender red-
purple nodules on the skin of the both legs. Laboratory results for P- and C-ANCA are negative. Urinalysis reveals hematuria and proteinuria. Abdominal ultrasound reveals few 1 – 2 cm fluid-filled cavities in the both kidneys. Which of the following is the most likely diagnosis?

a) Polyarteritis nodosa  
b) Microscopic polyangiits  
c) Chrurg-Strauss syndrome  
d) Henoch-Schonlein purpura  
e) Wegener granulomatosis

10) A 68-year-old African American male presents to his family physician office with abdominal discomfort and a periumbilical mass. Physical examination reveals a 6-cm pulsative abdominal mass in the periumbilical area. Abdominal CT scan reveals multiple calcifications and distension of the abdominal aorta. Which of the following is the most likely underlying cause for the described aortic changes?

a) Medial degeneration  
b) Cystic medial necrosis  
c) Atherosclerosis  
d) Fibrinoid necrosis  
e) Syphilitic aortitis

11) A 39-year-old Caucasian female seeks medical care because of transient hematuria and hemoptysis of one week duration. She had an acute bacterial pneumonia five weeks ago and from that time she has not felt well. Two weeks ago she noticed some blood nasal discharge.
The patient also complains that his left knee has been hurting and that red spots have appeared on his arms and legs. Physical examination reveals lower leg pitting edema, and multiple small, red, raised lesions on the skin of his extremities that are painless. BP is 155/100 mm Hg.

Lab findings:
- Moderate leukocytosis with ordinary WBC differential count
- UA: hematuria and proteinuria
- Elevated serum P-ANCA and C-ANCA levels
- Normal serum IgA level

Which of the following is the most likely diagnosis?

a) Polyarteritis nodosa  
b) Microscopic polyangiitis  
c) Rheumatic fever  
d) Subacute bacterial endocarditis  
e) Churg-Strauss syndrome

12) Clinical scenario from Q11. What histological changes will most likely be seen within the wall of the affected vessels?

a) Transmural inflammation with fibrinoid necrosis  
b) Necrotizing granuloma  
c) Eosinophilic granuloma  
d) Granuloma with intimal proliferation and elastic fiber destruction
13) A 48-year-old African American female presents with severe headache, blurred vision, and nausea. Physical examination reveals BP of 240/120 mm Hg and bilateral papilledema. Which of the following is the most likely diagnosis?

a) Accelerated benign hypertension  
b) **Hypertensive crisis**  
c) Hypertensive urgency  
d) Cerebrovascular accident

14) Histologic examination of a renal biopsy reveals necrotic changes of glomerular capillaries and proliferation of the epithelium of the Bowman capsule. Which of the following diseases the patient most likely has?

a) Polyarteritis nodosa  
b) Microscopic polyangiitis  
c) Henoch Shonlein purpura  
d) Churg-Strauss syndrome  
e) IgA nephropathy

15) Postmortem histologic examination of the heart from the patient who died of a confirmed acute myocardial infarction reveals coagulative necrosis of cardiomycocytes, multiple small
hemorrhages, and prominent polymorphonuclear infiltration. What is the most likely “age” of myocardial infarction in this patient?

a) < 4 hours  
b) 4 – 12 hours 
c) 12 – 24 hours 
d) 24 – 72 hours 
e) 4 – 7 days

16) Which of the following are the mechanisms of right ventricular failure in a patient with a mitral stenosis?

a) Reduced preload, volume overload, and pressure overload  
b) Increased preload, increased afterload, and impaired contractility  
c) Increased preload, reduced afterload, and impaired contractility  
d) Elevated preload, volume overload and pressure overload  
e) Reduced preload and impaired contractility

17) Histologic examination of the endomyocardial biopsy, obtained from a 12-year-old African girl, reveals small foci of fibrinoid necrosis with admixture of lymphocytes, epithelioid cells and multinucleated macrophages; some of macrophage nuclei contain chromatin arranged in “caterpillar” pattern. Which of the following is the most likely diagnosis?

a) Viral myocarditis 
b) Rheumatic myocarditis
c) Giant cell myocarditis

d) Endomyocardial fibrosis

e) Subacute bacterial endocarditis

18) Which of the following congenital heart defects will never become cyanotic?

a) Atrial septal defect

b) Ventricular septal defect

c) Aortic valvular stenosis

d) Tetralogy of Fallot

e) Transposition of great arteries

19) Which of the following clinical conditions is most likely to complicate varicosity of leg veins?

a) Deep vein thrombosis

b) Pulmonary thromboembolism

c) Systemic embolism

d) Gangrene

e) Ulceration

20) A 38-year-old Caucasian female is brought to the emergency room with syncope, dizziness, and left-sided hemiplegia. After admission she developed an intense chest pain and dies. Postmortem examination reveals a cerebral infarction in the area of the middle cerebral artery.
and a 2-cm semitranslucent elastic mass firmly attached to the wall of the left atrium. Which of the following are the most likely histologic findings in this case?

a) Myxoid matrix with sparse stellate cells
b) Hemorrhagic adipose tissue
c) Bundles of spindle-shaped cells and vascular channels
d) Pleomorphic rhabdomyocytes
e) Pleomorphic endothelial cells and vascular channels

21) A 24-year-old African American male, a professional football player develops a severe chest pain during a game. Echocardiography reveals an asymmetrically thickened interventricular septum along with a decreased end-diastolic volume. Which of the following is the most likely diagnosis?

a) Hypertrophic cardiomyopathy
b) Endomyocardial fibrosis
c) Dilated cardiomyopathy
d) Restrictive cardiomyopathy
e) Physiologic heart hypertrophy

22) Postmortem examination of a 60 year old Caucasian male, who died with multiple symptoms of left sided heart failure including cough and dyspnea, reveals dilated thoracic aorta with diffuse and perivascular mononuclear infiltrate within the tunica adventitia and media. What laboratory test finding is most likely to be found in the patient’s medical record?
23) A newborn Caucasian baby boy was observed at birth to be noncyanotic. The mother was known to have been infected with rubella during the pregnancy. On examination, the patient is found to have a continuous murmur that is present in both systole and diastole. A non-steroidal anti-inflammatory drug was prescribed, and on follow-up, the murmur was found to have disappeared. Which of the following is the most likely congenital heart defect?

a) Transposition of great arteries 

b) Patent truncus arteriosus 

c) Tetralogy of Fallot 

d) Patent ductus arteriosus 

e) Coarctation of the aorta 

24) Postmortem examination of a 42-year-old Hispanic male, an intravenous drug user who died after four days of an acute febrile illness, reveals destroyed aortic valve with cusps covered by bulky dirty-grey fragile deposits. What laboratory test finding is most likely to be found in the patient’s medical record?

a) Elevated anti-streptolysin–O titer 

b) High serum c-ANCA titer
c) Increased CK-MB fraction  
d) High p-ANCA titer  
e) Positive culture for Staph aureus

25) A 31-year-old Caucasian male dies after seven days of an acute coxsackievirus infection. Autopsy reveals a widely distended pericardial sac filled with serous fluid. The heart is of normal weight. Both ventricular walls are of normal thickness and all chambers are of normal size. There is no history of cardiac abnormalities prior to infection and a heart monitor during the course of the illness shows no evidence of fatal arrhythmia. Which of the following is the most likely mechanism for heart failure?

a) Reduced preload  
b) Increased preload  
c) Increased afterload  
d) Decreased afterload  
e) Impaired contractility

ANSWERS: 1f; 2d; 3c; 4c; 5d; 6e; 7a; 8d; 9a; 10c; 11b; 12a; 13b; 14b; 15d; 16a; 17b; 18c; 19e; 20a; 22d; 23d; 24e; 25a