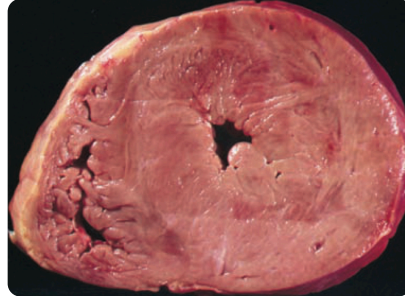


MCQ PATHOLOGY

1*The illustration shows a section of the heart from a 45-year-old African-American man with long-standing hypertension who died of a "stroke ." Which of the following adaptive changes is exemplified in the illustration ?

- A* Aplasia
- B* Atrophy
- C* Hyperplasia
- D* Hypertrophy
- E* Hypoplasia



2*A 45-year -old woman is investigated for hypertension and is found to have enlargement of the left kidney. The right kidney is smaller than normal. Contrast studies reveal stenosis of the right renal artery. The size change in the right kidney is an example of which of the following adaptive changes?

- A* Aplasia
- B* Atrophy
- C* Hyperplasia
- D* Hypertrophy
- E* Metaplasia

3*A 53-year-old woman with no prior illnesses has a routine checkup by her physician. On examination she has a blood pressure of 150/95 mm Hg. If her hypertension remains untreated for years, which of the following cellular alterations would most likely be seen in her myocardium?

- A* Apoptosis
- B* Dysplasia
- C* Fatty change
- D* Hyperplasia
- E* Hypertrophy
- F* Metaplasia

MCQ PATHOLOGY

4* A 71-year-old man has had difficulty with urination, including hesitancy and increased frequency, for the past 5 years. A digital rectal examination reveals that his prostate gland is palpably enlarged to twice normal size. A transurethral resection of the prostate is performed, and the microscopic appearance of the prostate "chips" obtained is that of nodules of glands with intervening stroma. Which of the following pathologic processes has most likely occurred in his prostate?

- A* Apoptosis
- B* Dysplasia
- C* Fatty change
- D* Hyperplasia
- E* Hypertrophy
- F* Metaplasia

5* A 29-year-old man sustains a left femoral fracture in a motorcycle accident. His leg is placed in a plaster cast. After his left leg has been immobilized for 6 weeks, the diameter of the left calf has decreased in size. This change in size is most likely to result from which of the following alterations in his calf muscles?

- A* Aplasia
- B* Atrophy
- C* Dystrophy
- D* Hyalinosis
- E* Hypoplasia

6* A 34-year-old obese woman has experienced heartburn from gastric reflux for the past 5 years after eating large meals. She undergoes upper gastrointestinal endoscopy, and a biopsy specimen of the distal esophagus is obtained. Which of the following microscopic changes, seen in the figure, has most likely occurred?

- A* Columnar metaplasia
- B* Goblet cell hyperplasia
- C* Lamina propria atrophy
- D* Squamous dysplasia
- E* Mucosal hypertrophy

MCQ PATHOLOGY

7*A 43-year-old man has complained of mild burning substernal pain following meals for the past 3 years. Upper GI endoscopy is performed and biopsies are taken of an erythematous area of the lower esophageal mucosa 3 cm above the gastroesophageal junction. There is no mass lesion, no ulceration, and no hemorrhage noted. The biopsies show the presence of columnar epithelium with goblet cells. Which of the following mucosal alterations is most likely represented by these findings?

- A* Dysplasia
- B* Hyperplasia
- C* Carcinoma
- D* Ischemia
- E* Metaplasia

8*A study is performed to identify predisposing risks for tissue cellular changes. In some persons epithelial metaplasia occurs. In which of the following situations is the process of epithelial metaplasia most likely to take place?

- A* Tanning of the skin following sunlight exposure
- B* Lactation following pregnancy
- C* Vitamin A deficiency
- D* Acute myocardial infarction
- E* Urinary obstruction from an enlarged prostate

9*A 71-year-old man has difficulty with urination . His urinary retention leads to numerous trips to the restroom per day. On digital rectal examination is prostate is diffusely enlarged. Which of the following represents a pathologic change leading to this man's problem?

- A* Dysplasia
- B* Hypertrophy
- C* Hyperplasia
- D* Metaplasia
- E* Neoplasia

MCQ PATHOLOGY

10* A 3-year-old child has been diagnosed with ornithine transcarbamylase deficiency and has developed hepatic failure. The left lobe of an adult donor liver is used as an orthotopic transplant. A year later, the size of each liver in donor and recipient is greater than at the time of transplantation. Which of the following cellular alterations is most likely to explain this phenomenon?

- A* Metaplasia
- B* Dysplasia
- C* Hyperplasia
- D* Anaplasia
- E* Neoplasia

11* A 50-year-old male dies during a car accident. At autopsy, he is noted to have a moderately stenotic aortic valve. The heart weighs 500 grams. The cause of death from the motor vehicle accident is entirely blunt force injuries of the head and neck, including an atlantooccipital dislocation. No internal injuries below the neck are identified. There is no history of heart failure. A section of the myocardium from the left ventricle would reveal which of the following processes?

- A* Hypertrophy
- B* Hyperplasia
- C* Atrophy
- D* Metaplasia
- E* Reversible cell injury
- F* Irreversible cell injury

12* A 25-year-old male, who is an offensive lineman for the local college football team, dies during a car accident. At autopsy, the injuries, being multiple rib fractures and lacerations of the lungs and heart, with 1500 mL of blood found in the left pleural cavity, are confined to the chest. At autopsy, a biopsy of his left biceps femoris muscle would reveal which of the following?

- A* Physiologic hyperplasia
- B* Pathologic hyperplasia
- C* Physiologic hypertrophy
- D* Pathologic hypertrophy
- E* Physiologic atrophy
- F* Pathologic atrophy

MCQ PATHOLOGY

13* A 2-year-old female aspirates a small coin, unbeknownst to her caregivers. Over the next few days, she develops a cough and becomes less responsive and sleeps longer periods. Her parents also notice that she feels warm to the touch, but do not take her temperature. Six days following the coin being swallowed, her parents find her unresponsive in her bedroom. They call 9-1-1 and she is pronounced dead at the hospital. Autopsy reveals a widespread bronchopneumonia in the right lung and a coin lodged in the right mainstem bronchus, nearly completely blocking it. A microscopic section of the bronchus from where the coin was lodged reveals stratified squamous epithelium, which appears essentially normal, similar to that seen in the inner lining of the esophagus. Which of the following processes has occurred in the bronchus?

- A* Hypertrophy
- B* Hyperplasia
- C* Metaplasia
- D* Atrophy
- E* Irreversible cellular injury

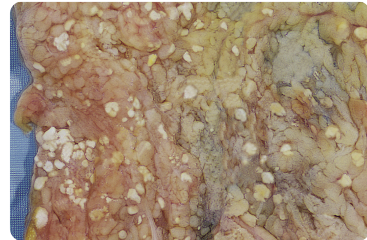
14* After developing hematuria and flank pain, a 55-year-old male is diagnosed with a renal cell carcinoma in his right kidney. To treat the tumor, the patient's right kidney is resected. Five years later, he dies in a car accident. At autopsy, there is an absence of the right kidney, and the left kidney weighs 300 grams (normal weight is 150-200 grams for an adult male). Of the following processes, which is most likely occurring in the left kidney?

- A* Physiologic hypertrophy
- B* Pathologic hypertrophy
- C* Physiologic hyperplasia, hormonal type
- D* Physiologic hyperplasia, compensatory type
- E* Pathologic hyperplasia

MCQ PATHOLOGY

15* A 38-year-old woman has experienced severe abdominal pain over the past day. On examination she is hypotensive and in shock. Laboratory studies show elevated serum lipase. From the representative gross appearance of the mesentery shown in the figure, which of the following events has most likely occurred?

- A* Acute pancreatitis
- B* Gangrenous cholecystitis
- C* Hepatitis B virus infection
- D* Small intestinal infarction
- E* Tuberculous lymphadenitis

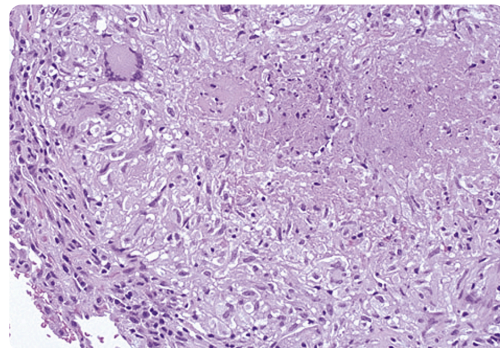


16* A 68-year-old woman suddenly lost consciousness and on awakening 1 hour later, she could not speak or move her right arm. Two months later, a head CT scan showed a large cystic area in the left parietal lobe. Which of the following pathologic processes has most likely occurred in her brain?

- A* Apoptosis
- B* Coagulative necrosis
- C* Fat necrosis
- D* Karyolysis
- E* Liquefactive necrosis

17* A screening chest radiograph of an asymptomatic 37-year-old man shows a 3-cm nodule in the middle lobe of his right lung. The nodule is excised with a pulmonary wedge resection, and sectioning shows a sharply circumscribed mass with a soft, white center. The microscopic appearance is shown in the figure. The serum interferon gamma release assay is positive. Which of the following pathologic processes has most likely occurred in this nodule?

- A* Apoptosis
- B* Caseous necrosis
- C* Coagulative necrosis
- D* Fat necrosis
- E* Fatty change
- F* Gangrenous necrosis
- G* Liquefactive necrosis



MCQ PATHOLOGY

18*A 29-year-old man hospitalised for acquired immunodeficiency syndrome (AIDS) is found to have pulmonary tuberculosis. Which type of necrosis is found in the granulomatous lesions (clusters of modified macrophages) characteristic of this increasingly frequent complication of AIDS?

- A* Caseous
- B* Coagulative
- C* Enzymatic
- D* Fibrinoid
- E* Liquefactive

19*A 56-year-old man recovered from a myocardial infarction after his myocardium was entirely "saved" by immediate thrombolytic therapy. If it had been possible to examine microscopic sections of his heart during his ischemic episode, which of the following would be the most likely cellular change to be found?

- A* Karyolysis
- B* Karyorrhexis
- C* Pyknosis
- D* Swelling of the endoplasmic reticulum

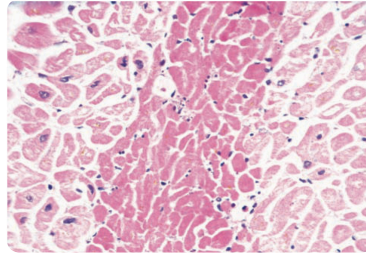
20*A 64-year-old woman presents with fever, chills, headache, neck stiffness, vomiting, and confusion. The Kernig sign (passive knee extension eliciting neck pain) and Brudzinski sign (passive neck flexion eliciting bilateral hip flexion) are both positive. Examination of the cerebrospinal fluid reveals changes consistent with bacterial meningitis, and brain imaging demonstrates a localized abscess. Which of the following types of necrosis is most characteristic of abscess formation?

- A* Caseous
- B* Coagulative
- C* Enzymatic
- D* Fibrinoid
- E* Liquefactive

MCQ PATHOLOGY

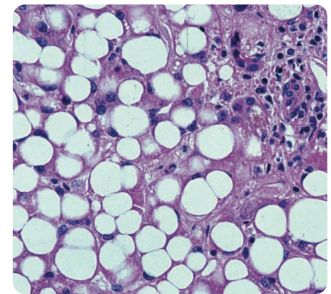
21*This figure illustrates the microscopic appearance of the heart of a 56-year-old man who died after a 24-hour hospitalization for severe "crushing" chest pain complicated by hypotension and pulmonary edema. The type of necrosis shown is best described as

- A* caseous.
- B* coagulative.
- C* fibrinoid.
- D* gangrenous.
- E* liquefactive.



22*The illustration is from a liver biopsy of a 34-year-old woman with a long history of alcoholism. Which of the following is the best explanation for the changes shown here?

- A* Accumulation of triglycerides within hepatocytes
- B* Apoptosis with replacement of damaged cells by lipid-laden macrophages
- C* Bilirubin accumulation with mobilization of fat by bile salts
- D* Enzymatic fat necrosis with digestion of liver parenchyma by released enzymes
- E* Irreversible damage to mitochondria



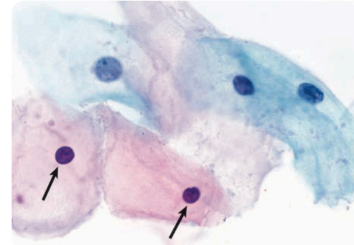
23*A 56-year-old man dies 24 hours after the onset of substernal chest pain radiating down his left arm to the ulnar aspect of his fingertips. Which of the following morphologic myocardial findings is an indicator of irreversible injury?

- A* Cell blebs
- B* Depletion of glycogen
- C* Mitochondrial swelling
- D* Myelin figures
- E* Pyknotic nuclei

MCQ PATHOLOGY

24* A 31-year-old woman complains of increased vaginal discharge of 1-month duration. A cervical Pap smear is shown in the image. Superficial epithelial cells are identified with arrows. When compared to cells from the deeper intermediate layer (top), the nuclei of these superficial cells exhibit which of the following cytologic features?

- A* Karyolysis
- B* Karyorrhexis
- C* Pyknosis
- D* Segmentation
- E* Viral inclusion bodies



25* A 37-year-old male with a history of chronic alcohol abuse and gallstones is brought to the emergency room by a friend. The patient has been complaining of severe abdominal pain for 3 days following a bout of increased alcohol consumption. Laboratory testing in the emergency room indicates an elevated amylase and lipase. Despite treatment, the patient dies. An autopsy of the individual most likely will reveal which of the following in the greater omentum?

- A* Coagulative necrosis
- B* Liquefactive necrosis
- C* Gangrenous necrosis
- D* Caseous necrosis
- E* Fat necrosis
- F* Fibrinoid necrosis

26* A pathologist is examining a section of kidney and notes hydropic change in the proximal convoluted tubule epithelial cells. Damage to or decreased function of which of the following cellular structures is most important in directly causing this finding?

- A* Rough endoplasmic reticulum
- B* Smooth endoplasmic reticulum
- C* Sodium-potassium pump
- D* Phagocyte oxidase
- E* Cytoskeletal proteins

MCQ PATHOLOGY

27* A 50-year-old woman with a history of unstable angina suffers an acute myocardial infarction. Thrombolytic therapy with tissue plasminogen activator (tPA) is administered to restore coronary blood flow. In spite of this therapy, the extent of myocardial fiber injury may increase because of which of the following cellular abnormalities?

- A* Cytoskeletal intermediate filament loss
- B* Decreased intracellular pH from anaerobic glycolysis
- C* Increased free radical formation
- D* Mitochondrial swelling
- E* Nuclear chromatin clumping
- F* Reduced protein synthesis

28* An impending myocardial infarction was successfully averted by thrombolytic (clot-dissolving) therapy in a 55-year-old man. Which of the following biochemical events most likely occurred during the period of hypoxia?

- A* Decreased hydrogen ion concentration
- B* Increase in oxidative phosphorylation
- C* Loss of intracellular Na^+ and water
- D* Stimulation of ATP synthesis
- E* Stimulation of anaerobic glycolysis and glycogenolysis

29* A 40-year-old man is pulled from the ocean after a boating accident and resuscitated. Six hours later, the patient develops acute renal failure. Kidney biopsy reveals evidence of karyorrhexis and karyolysis in renal tubular epithelial cells. Which of the following biochemical events preceded these pathologic changes?

- A* Activation of Na^+/K^+ ATPase
- B* Decrease in intracellular calcium
- C* Decrease in intracellular pH
- D* Increase in ATP production
- E* Increase in intracellular pH

MCQ PATHOLOGY

30* A 24-year-old woman accidentally ingests carbon tetrachloride (CCl₄) in the laboratory and develops acute liver failure. Which of the following cellular proteins was directly involved in the development of hepatotoxicity in this patient?

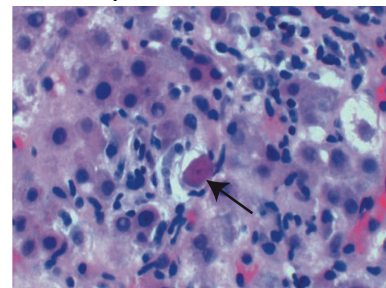
- A* Acetaldehyde dehydrogenase
- B* Alcohol dehydrogenase
- C* Glucose-6-phosphate dehydrogenase
- D* Mixed function oxygenase
- E* Superoxide dismutase

31* A cellular mutation results in transcription with translation of a protein that does not fold properly. The misfolded protein remains within the cell and is not excreted. Activation of which of the following cytoplasmic enzymes is most likely to occur?

- A* Caspase
- B* Glutathione peroxidase
- C* NADPH oxidase
- D* Ribonuclease
- E* Telomerase

32* A 42-year-old man undergoes liver biopsy for evaluation of the grade and stage of his hepatitis C virus infection. The biopsy reveals swollen (ballooned) hepatocytes and moderate lobular inflammatory activity (shown in the image). The arrow identifies an acidophilic (Councilman) body. Which of the following cellular processes best accounts for the presence of scattered acidophilic bodies in this liver biopsy?

- A* Aggregation of intermediate filament proteins
- B* Apoptotic cell death
- C* Coagulative necrosis
- D* Collagen deposition
- E* Intracellular viral inclusions



MCQ PATHOLOGY

33* A scientist is studying apoptosis. By the introduction of a naturally occurring chemical, she wishes to shorten the life span of cultured cells that are derived from a human liver and that have been exposed to radiation. Which of the following effects, if caused by the introduced chemical, would produce her desired outcome?

- A* Increased concentration of bcl-2
- B* Increased concentration of bcl-xL
- C* Increased concentration of BH3 proteins
- D* Decreased concentration of Bax
- E* Decreased concentration of Bad

34* An experiment introduces a knockout gene mutation into a cell line. The frequency of shrunken cells with chromatin clumping, karyorrhexis, and cytoplasmic blebbing is increased compared with a cell line without the mutation. Overall survival of the mutant cell line is reduced. Which of the following genes is most likely to be affected by this mutation?

- A* BAX
- B* BCL2
- C* C-MYC
- D* FAS
- E* p53

35* A 47-year-old man has a lung carcinoma with metastases. He receives chemotherapy. A month later, histologic examination of a metastatic lesion shows many foci in which individual tumor cells appear shrunken and deeply eosinophilic. Their nuclei exhibit condensed aggregates of chromatin under the nuclear membrane. The pathologic process affecting these shrunken tumor cells is most likely triggered by release of which of the following substances into the cytosol?

- A* BCL2
- B* Catalase
- C* Cytochrome c
- D* Lipofuscin
- E* Phospholipase

MCQ PATHOLOGY

36* A 71-year-old man diagnosed with pancreatic cancer is noted to have decreasing body mass index. His normal connective tissues undergo atrophy by sequestering organelles and cytosol in a vacuole, which then fuses with a lysosome. However, the cancer continues to increase in size. Which of the following processes is most likely occurring in the normal cells but is inhibited in the cancer cells of this man?

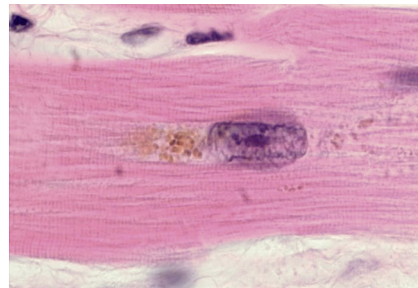
- A* Aging
- B* Apoptosis
- C* Autophagy
- D* Hyaline change
- E* Karyorrhexis

37* A 69-year-old woman has had transient ischemic attacks for the past 3 months. On physical examination, she has an audible bruit on auscultation of the neck. A right carotid end-arterectomy is performed. The curetted atheromatous plaque has a grossly yellow-tan, firm appearance. Microscopically, which of the following materials can be found in abundance in the form of crystals within cleftlike spaces?

- A* Cholesterol
- B* Glycogen
- C* Hemosiderin
- D* Immunoglobulin
- E* Lipofuscin

38* At autopsy, the heart of a 63-year-old man weighs only 250 g (normal 330 g) and has small right and left ventricles. The myocardium is firm, with a dark chocolate-brown color throughout. The coronary arteries show minimal atherosclerotic changes. An excessive amount of which of the following substances, shown in the figure, would most likely be found in the myocardial fibers of this heart?

- A* Bilirubin
- B* Glycogen
- C* Hemosiderin
- D* Lipofuscin
- E* Melanin



MCQ PATHOLOGY

39* A 69-year-old woman has had a chronic cough for the past year. A chest radiograph shows a 6-cm mass in the left lung. A needle biopsy specimen of the mass shows carcinoma. A pneumonectomy is performed, and examination of the hilar lymph nodes reveals a uniform, dark black cut surface. Which of the following factors most likely accounts for the appearance of these lymph nodes?

- A* Aging effects
- B* Bleeding disorder
- C* Cigarette smoking
- D* Liver failure
- E* Multiple metastases

40* A 22-year-old woman from Albania has a congenital anemia requiring multiple transfusions of RBCs for many years. On physical examination, her skin has a bronze color. Liver function tests show reduced serum albumin. Which of the following findings would most likely appear in a liver biopsy specimen?

- A* Amyloid in portal triads
- B* Bilirubin in canaliculi
- C* Glycogen in hepatocytes
- D* Hemosiderin in hepatocytes
- E* Steatosis in hepatocytes

41* A 72-year-old man died suddenly from congestive heart failure. At autopsy, his heart weighed 580 g (normal 330 g) and showed marked left ventricular hypertrophy and minimal coronary arterial atherosclerosis. A serum chemistry panel ordered before death showed no abnormalities. Which of the following pathologic processes best accounts for the appearance of the aortic valve seen in the figure?

- A* Amyloidosis
- B* Dystrophic calcification
- C* Hemosiderosis
- D* Hyaline change
- E* Lipofuscin deposition



MCQ PATHOLOGY

42* A 70-year-old man with hypercalcemia died suddenly. At autopsy, microscopic examination showed noncrystalline amorphous deposits of calcium salts in gastric mucosa, renal interstitium, and alveolar walls of lungs. Which of the following underlying conditions would most likely explain these findings?

- A* Chronic active hepatitis
- B* Diffuse parathyroid hyperplasia
- C* Disseminated tuberculosis
- D* Generalized atherosclerosis
- E* Normal aging process
- F* Pulmonary emphysema

43* An experiment analyzes cells for enzyme activity associated with sustained cellular proliferation. Which of the following cells is most likely to have the highest telomerase activity?

- A* Endothelial cells
- B* Erythrocytes
- C* Germ cells
- D* Neurons
- E* Neutrophils

44* A 60-year-old woman with breast cancer and widespread bony metastases is found to have calcification of multiple organs. The calcifications are best described as

- A* dystrophic with decreased serum calcium.
- B* dystrophic with increased serum calcium.
- C* metastatic with decreased serum calcium.
- D* metastatic with increased serum calcium.

45* A 45-year-old man is referred because of a recent diagnosis of hereditary hemochromatosis. Which of the following is a correct statement about this disorder?

- A* Damage to organs results from abnormal deposition of lead
- B* It can progress to liver cirrhosis, diabetes mellitus, and skin pigmentation
- C* Most cases are due to spontaneous mutations
- D* Skin hyperpigmentation is due to bilirubin accumulation
- E* The TIBC is characteristically increased

MCQ PATHOLOGY

46* A forensic pathologist is examining a section of skin. Just underneath the dermis is a large collection of macrophages, each containing a stippled, or some what chunky-appearing, yellow-brown pigment. The pathologist orders a Prussian blue stain, which causes the pigment to appear blue. Of the following, which is the most likely etiology for the pigment?

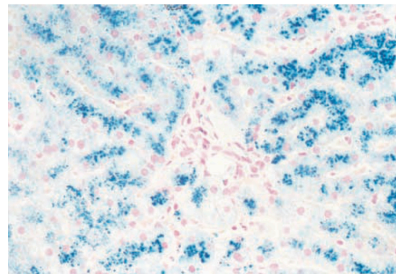
- A* Abnormal protein accumulation in an alcoholic
- B* Previous trauma that resulted in hemorrhage
- C* Wear-and-tear pigment in an older individual
- D* Cigarette smoking
- E* Normal melanin accumulation in a darkly pigmented individual

47* A CT scan of a 43-year-old woman with a parathyroid adenoma and hyperparathyroidism reveals extensive calcium deposits in the lungs and kidney parenchyma. These radiologic findings are best explained by which of the following mechanisms of disease?

- A* Arteriosclerosis
- B* Dystrophic calcification
- C* Granulomatous inflammation
- D* Metastatic calcification
- E* Tumor embolism

48* A 45-year-old man presents with increasing abdominal girth and yellow discoloration of his skin and sclera. Physical examination reveals hepatomegaly and jaundice. A Prussian blue stain of a liver biopsy is shown in the image. What is the major intracellular iron storage protein in this patient's hepatocytes?

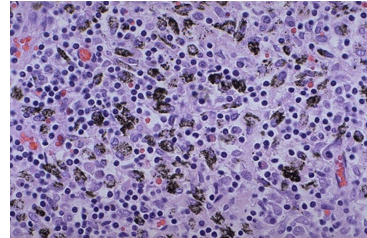
- A* Bilirubin
- B* Haptoglobin
- C* Hemoglobin
- D* Hemosiderin
- E* Transferrin



MCQ PATHOLOGY

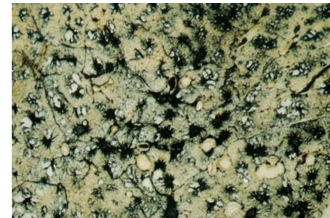
49* A 66-year-old man is diagnosed with a squamous cell carcinoma of the right lung. While performing a pneumonectomy, the thoracic surgeon notes that the hilar lymph nodes are small, 0.5 to 1.0 cm in size, and jet black in color throughout. The microscopic appearance of one lymph node is seen here. Which of the following is the most likely diagnosis for this lymph node?

- A* Anthracosis
- B* Metastatic carcinoma
- C* Hemosiderosis
- D* Accumulation of melanin
- E* Lipochrome deposition



50* A 65-year-old man suffers a heart attack and expires. Examination of the lungs at autopsy reveals numerous pigmented nodules scattered throughout the parenchyma (shown in the image). What is the appropriate diagnosis?

- A* Anthracosis
- B* Asbestosis
- C* Hemosiderosis
- D* Sarcoidosis
- E* Silicosis



MCQ PATHOLOGY

1* A B C ~~D~~ E F G

4* A B C ~~D~~ E F G

7* A B C D ~~E~~ F G

10* A B ~~C~~ D E F G

13* A B ~~C~~ D E F G

16* A B C D ~~E~~ F G

19* A B C ~~D~~ E F G

22* ~~A~~ B C D E F G

25* A B C D ~~E~~ F G

28* A B C D ~~E~~ F G

31* ~~A~~ B C D E F G

34* A ~~B~~ C D E F G

37* ~~A~~ B C D E F G

40* A B C ~~D~~ E F G

43* A B ~~C~~ D E F G

46* A ~~B~~ C D E F G

49* ~~A~~ B C D E F G

2* A ~~B~~ C D E F G

5* A ~~B~~ C D E F G

8* A B ~~C~~ D E F G

11* ~~A~~ B C D E F G

14* A B C ~~D~~ E F G

17* A ~~B~~ C D E F G

20* A B C D ~~E~~ F G

23* A B C D ~~E~~ F G

26* A B ~~C~~ D E F G

29* A B ~~C~~ D E F G

32* A ~~B~~ C D E F G

35* A B ~~C~~ D E F G

38* A B C ~~D~~ E F G

41* A ~~B~~ C D E F G

44* A B C ~~D~~ E F G

47* A B C ~~D~~ E F G

50* ~~A~~ B C D E F G

3* A B C D ~~E~~ F G

6* ~~A~~ B C D E F G

9* A B ~~C~~ D E F G

12* A B ~~C~~ D E F G

15* ~~A~~ B C D E F G

18* ~~A~~ B C D E F G

21* A ~~B~~ C D E F G

24* A B ~~C~~ D E F G

27* A B ~~C~~ D E F G

30* A B C ~~D~~ E F G

33* A B ~~C~~ D E F G

36* A B ~~C~~ D E F G

39* A B ~~C~~ D E F G

42* A ~~B~~ C D E F G

45* A ~~B~~ C D E F G

48* A B C ~~D~~ E F G