Emergency Medicine In-Training Examination (EM-ITE) Practice Test (Sample)

Study Guide

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Questions

1. What ultrasound finding is expected for a glass foreign body?

A. Hypoechoic object without shadowing

B. Hyperechoic object with shadowing

C. Complex cystic mass

D. Mosaic pattern

2. What condition is characterized by bilateral motor/sensory deficits with greater involvement of the upper extremities?

A. Brown-Sequard syndrome

B. Central cord syndrome

C. Anterior cord syndrome

D. Posterior cord syndrome

3. What is a significant vestibular effect caused by lateral medullary infarction?

A. Diplopia

B. Ataxia

C. Vomiting

D. Vertigo

4. What sedative should be avoided in rapid sequence intubation (RSI) in septic patients?

A. Propofol

B. Etomidate

C. Midazolam

D. Ketamine

5. Which of the following symptoms is associated with Wallenburg syndrome?

A. Hyperreflexia

B. Loss of pain and temperature sensation

C. Loss of proprioception

D. Severe headaches

6. What congenital syndromes can be exacerbated by cold water immersion leading to fatal dysrhythmias?

A. Marfan syndrome

B. Down syndrome

C. Prolonged QT syndrome

D. Muscular dystrophy

7. What is the most common predisposing condition for spontaneous pneumomediastinum with subcutaneous emphysema?

A. Obesity

B. Chronic bronchitis

C. Asthma

D. Emphysema

8. A patient with chest discomfort, dyspnea, and fever, with a history of chronic anemia and scleral icterus, is most likely experiencing which condition?

A. Acute respiratory distress syndrome

B. Acute chest syndrome

C. Congestive heart failure

D. Pneumonia

9. Which nerve root injury can present with symptoms affecting the ulnar aspect of the forearm?

A. C6 nerve root

B. C7 nerve root

C. C8 nerve root

D. T1 nerve root

10. What organism is commonly associated with atypical pneumonia characterized by dry cough, dyspnea, and gastrointestinal symptoms?

A. Mycoplasma pneumoniae

B. Legionella pneumophila

C. Chlamydia pneumoniae

D. Streptococcus pneumoniae

Answers

1. B
2. B
3. D
4. B
5. B
6. C
7. C
8. B
9. D
10. B

Explanations

1. What ultrasound finding is expected for a glass foreign body?

A. Hypoechoic object without shadowing

B. Hyperechoic object with shadowing

C. Complex cystic mass

D. Mosaic pattern

The expected ultrasound finding for a glass foreign body is a hyperechoic object with shadowing. When glass is imaged using ultrasound, it appears as a bright white reflection due to its high acoustic impedance compared to surrounding soft tissues. This hyperechoic appearance indicates that the glass is dense, reflecting a significant amount of the ultrasound waves. Additionally, the presence of shadowing beneath the glass foreign body occurs because the dense material absorbs and reflects the sound waves, causing a lack of echogenicity in the deeper tissues behind it. This phenomenon helps differentiate glass from other objects, as many soft tissues do not produce such shadowing effects. Recognizing these ultrasound characteristics is critical in emergency medicine when diagnosing and managing patients with potential foreign body injuries. In contrast, other findings like a hypoechoic object without shadowing would not accurately represent the dense nature of glass, while a complex cystic mass and a mosaic pattern are indicative of entirely different conditions or materials, such as fluid collections or certain types of masses in the body.

2. What condition is characterized by bilateral motor/sensory deficits with greater involvement of the upper extremities?

A. Brown-Sequard syndrome

B. Central cord syndrome

C. Anterior cord syndrome

D. Posterior cord syndrome

Central cord syndrome is characterized by bilateral motor and sensory deficits that predominantly affect the upper extremities more than the lower extremities. This condition usually occurs due to damage to the central part of the spinal cord, often from conditions like cervical spondylosis or spinal cord injury. The pattern of involvement is typically upper extremity weakness combined with preserved function in the lower extremities, which distinguishes it from other syndromes. In the context of central cord syndrome, because the central pathways responsible for the upper limb motor control are more affected than those for the lower limbs, patients often present with greater weakness and sensory loss in their arms compared to the legs. It is a common presentation in older adults who may have degenerative changes in the cervical spine, leading to this specific type of cord injury. The other conditions mentioned have different mechanisms or patterns of neurological involvement. For instance, Brown-Sequard syndrome is characterized by unilateral motor weakness and loss of proprioception and vibratory sense on the same side as the injury, while pain and temperature sensation are lost on the opposite side. Anterior cord syndrome presents with loss of motor function and pain/temperature sensation below the level of the injury due to the damage of the anterior two-thirds of the cord, while the posterior

3. What is a significant vestibular effect caused by lateral medullary infarction?

A. Diplopia

B. Ataxia

C. Vomiting

D. Vertigo

The significant vestibular effect caused by lateral medullary infarction is vertigo. This type of stroke affects the posterior circulation of the brain, particularly impacting the lateral medulla oblongata. This region is crucial for processing sensory information from the vestibular system, which is responsible for maintaining balance and spatial orientation. When a lateral medullary infarction occurs, the blood supply to the vestibular nuclei is compromised, leading to disturbances in balance and perception of motion. As a result, patients often experience vertigo, which is characterized by a sensation of spinning or movement when there is none. This symptom can be quite debilitating and is a direct result of dysfunction in the vestibular pathways. In contrast, the other effects listed—diplopia, ataxia, and vomiting—may occur due to a range of issues affecting the central nervous system but are not as specific to the vestibular impact of lateral medullary infarction. Diplopia relates more to cranial nerve involvement, ataxia could stem from cerebellar damage or proprioceptive loss, and vomiting can be associated with increased intracranial pressure or irritation of the vestibular system but is not the hallmark symptom of this specific infarction. Overall, vertigo stands out

4. What sedative should be avoided in rapid sequence intubation (RSI) in septic patients?

A. Propofol

B. Etomidate

C. Midazolam

D. Ketamine

Etomidate is considered the sedative to avoid in rapid sequence intubation (RSI) in septic patients primarily due to its effect on adrenal function. In patients who are septic, there is a risk of adrenal insufficiency, and etomidate can severely suppress cortisol production. This is critical because patients with sepsis often require adequate cortisol levels to manage their stress response and maintain hemodynamic stability. While etomidate is known for its cardiovascular stability and rapid onset, the potential of causing significant adrenal suppression raises concerns in the context of septic patients who may already be in a precarious state. Instead, other sedatives like propofol and ketamine offer a more favorable profile for use in this population by minimizing the risk of adrenal suppression and supporting hemodynamic stability. Overall, while etomidate may be safe in certain situations, its use in septic patients should be approached with caution due to these important endocrine considerations.

5. Which of the following symptoms is associated with Wallenburg syndrome?

A. Hyperreflexia

B. Loss of pain and temperature sensation

C. Loss of proprioception

D. Severe headaches

Wallenburg syndrome, also known as lateral medullary syndrome, is primarily characterized by the loss of pain and temperature sensation on one side of the body. This occurs due to a lesion in the lateral medulla oblongata, often resulting from an infarction typically related to vertebral artery occlusion. The affected pathways include the spinothalamic tract, which conveys pain and temperature sensations, and damage to this area leads to contralateral loss of these sensations. Furthermore, Wallenburg syndrome can present additional symptoms, such as dysphagia, dysarthria, and ataxia due to involvement of other neural structures, but the hallmark feature remains the loss of pain and temperature sensation. This symptom aligns with the process by which the neural pathways are affected following the localized vascular impairment in the medulla.

6. What congenital syndromes can be exacerbated by cold water immersion leading to fatal dysrhythmias?

A. Marfan syndrome

B. Down syndrome

C. Prolonged QT syndrome

D. Muscular dystrophy

Cold water immersion can lead to fatal dysrhythmias primarily due to the physiological stress it places on the cardiovascular system. Individuals with prolonged QT syndrome are particularly vulnerable in this scenario. This condition is characterized by an extended QT interval on an electrocardiogram, which represents the time it takes for the heart's electrical system to reset after each heartbeat. When such individuals are exposed to extreme cold, their heart may not respond appropriately to the sudden stress, resulting in life-threatening arrhythmias like torsades de pointes. The mechanism of cold water immersion can trigger an autonomic response, usually leading to bradycardia and increased vagal tone, which can further exacerbate the already prolonged QT interval. The combination of these factors puts individuals with prolonged QT syndrome at a significantly higher risk for cardiac events compared to the general population. In contrast, while other congenital syndromes may have cardiovascular implications, they do not show the same consistent vulnerability to cold water immersion leading to fatal dysrhythmias. For example, Marfan syndrome is associated with cardiovascular complications such as aortic dissection but is not directly linked to dysrhythmias triggered by temperature changes. Down syndrome has various associated health issues but similarly lacks a specific connection to dysrhythmias exacerb

7. What is the most common predisposing condition for spontaneous pneumomediastinum with subcutaneous emphysema?

A. Obesity

B. Chronic bronchitis

C. Asthma

D. Emphysema

Spontaneous pneumomediastinum occurs when air leaks into the mediastinum, often without a clear traumatic cause. One of the most common conditions predisposing individuals to this phenomenon is asthma. Asthma is characterized by episodes of airway obstruction due to bronchoconstriction, inflammation, and increased mucus production. During a severe asthma attack, the increased effort of breathing can lead to elevated intrathoracic pressures. This pressure can rupture alveoli or other airways, allowing air to escape into the mediastinum and subsequently into the subcutaneous tissue, leading to subcutaneous emphysema. The characteristic hyperinflation of the lungs associated with asthma can further exacerbate this condition. In contrast, while other conditions like obesity, chronic bronchitis, and emphysema can contribute to respiratory distress, they do not specifically create the same mechanisms or risks for spontaneous pneumomediastinum to the extent seen in patients with asthma.

8. A patient with chest discomfort, dyspnea, and fever, with a history of chronic anemia and scleral icterus, is most likely experiencing which condition?

A. Acute respiratory distress syndrome

B. Acute chest syndrome

C. Congestive heart failure

D. Pneumonia

The symptoms described in the scenario—chest discomfort, dyspnea, fever, along with a history of chronic anemia and scleral icterus—are indicative of acute chest syndrome, particularly in the context of a patient with a history suggestive of sickle cell disease. Acute chest syndrome is a serious complication seen in patients with sickle cell anemia, characterized by the presence of new pulmonary infiltrates on imaging, chest pain, fever, and respiratory symptoms. The combination of dyspnea and chest discomfort, especially in the setting of a patient with chronic anemia and scleral icterus (which indicates possible hemolysis and suggests sickling events), strongly points to this diagnosis. The acute development of respiratory symptoms alongside fever in a patient with a known history of sickle cell disease is particularly indicative of acute chest syndrome, which can be precipitated by factors such as infection, pulmonary fat embolism, or vaso-occlusive events. It is critical to recognize this condition quickly, as it is a medical emergency that requires prompt treatment to prevent further complications. Other conditions listed may share some common symptoms but do not fit as well with the unique presentation and history of this patient. For example, pneumonia typically presents with severe respiratory symptoms

9. Which nerve root injury can present with symptoms affecting the ulnar aspect of the forearm?

A. C6 nerve root

B. C7 nerve root

C. C8 nerve root

D. T1 nerve root

The correct response is based on the anatomy of the brachial plexus and the specific nerve root contributions to sensory innervation in the forearm and hand. The C8 and T1 nerve roots contribute to the ulnar nerve, which supplies sensation to the ulnar aspect of the forearm and the little finger and half of the ring finger. In particular, the T1 nerve root is responsible for the innervation of the muscles and skin along this region, including the intrinsic muscles of the hand supplied by the ulnar nerve. Damage or injury to the T1 nerve root can lead to sensory loss or abnormal sensations in the ulnar distribution, including the inner aspect of the forearm, which correlates with the symptoms described in the question. In contrast, injury to the other nerve roots C6, C7, and C8 may cause different patterns of sensory deficits that do not primarily impact the ulnar aspect of the forearm, highlighting the unique role that the T1 nerve root plays in this specific clinical context.

10. What organism is commonly associated with atypical pneumonia characterized by dry cough, dyspnea, and gastrointestinal symptoms?

A. Mycoplasma pneumoniae

B. Legionella pneumophila

C. Chlamydia pneumoniae

D. Streptococcus pneumoniae

The organism commonly associated with atypical pneumonia, especially characterized by dry cough, dyspnea, and gastrointestinal symptoms, is Legionella pneumophila. This pathogen is known to cause a distinct clinical picture with symptoms that extend beyond the respiratory system, including diarrhea and abdominal pain, unlike many other types of pneumonia. Legionella infections can manifest as Legionnaires' disease, which typically presents with severe pneumonia along with gastrointestinal symptoms, making it crucial to recognize in the context of an atypical pneumonia presentation. The dry cough and dyspnea are typical respiratory symptoms of pneumonia in general, but the incorporation of gastrointestinal symptoms is particularly indicative of an infection with Legionella. Other organisms listed can also cause pneumonia, but their symptom profiles differ. For instance, Mycoplasma pneumoniae often leads to a more classic presentation of atypical pneumonia but is less associated with gastrointestinal symptoms than Legionella. Chlamydia pneumoniae can also cause atypical pneumonia, though it frequently presents with milder respiratory symptoms and fewer systemic signs. Streptococcus pneumoniae typically causes lobar pneumonia with a productive cough and is not considered atypical. Thus, Legionella pneumophila stands out due to its unique clinical manifestation, aligning closely with the symptoms described in the question.