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Tension Pneumocephalus

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Pathophysiology

Tension pneumocephalus is a rare but deadly clinical condition. It occurs when there is an abnormal increase in intracranial air pressure, leading to a life-threatening situation. The disease is characterized by the presence of increased intracranial air pressure, which can lead to impaired brain function and potentially cause death.

Pathogenesis

Tension pneumocephalus is a complex disease with multiple factors contributing to its development. The underlying cause of tension pneumocephalus is usually due to a subarachnoid subdural air collection caused by a tear in the meninges, resulting in a communication between the subarachnoid space and the atmosphere. This communication allows air to enter the cranial cavity, leading to increased intracranial pressure and associated symptoms.

Signs and Symptoms

The signs and symptoms of tension pneumocephalus can vary greatly depending on the severity and duration of the condition. Common signs and symptoms include:

- Headache
- Vomiting
- Nausea
- Dizziness
- Photophobia
- Confusion
- Coma
- Seizures

These symptoms can be accompanied by other neurological symptoms, such as cranial nerve palsies and changes in mental status.

Diagnosis

The diagnosis of tension pneumocephalus is typically made through imaging studies, such as computed tomography (CT) or magnetic resonance imaging (MRI). These imaging studies can reveal the presence of increased intracranial air pressure and help identify the underlying cause of the condition.

Treatment

The treatment of tension pneumocephalus is usually emergent and involves the evacuation of trapped air from the cranial cavity. This can be done surgically or through less invasive procedures, such as percutaneous air evacuation or endoscopic surgery. In severe cases, mechanical ventilation may be necessary to reduce intracranial pressure and support respiratory function.

Nursing Implications

Nursing care for patients with tension pneumocephalus is crucial to implementing effective treatment and managing the associated symptoms. Nurses need to be aware of the signs and symptoms of the condition and take immediate action to diagnose and manage the situation.

References


Case Study

A 68-year-old man with a history of stage IV esophageal cancer presented to the emergency department, complaining of the worst headache of his life and was found to have an intracranial mass on computed tomography (CT) imaging. (Patel et al., 2013). The patient was admitted to the hospital for IV corticosteroids and additional workup. He continued to have progressively worsening symptoms over the next 48 hours, including new onset seizures, vomiting, worsening headache, and eventually became obtunded. The patient was transferred to the neurosurgical floor for emergent treatment.

The patient underwent emergent intubation and external ventricular drain (EVD) placement by the neurosurgical team. The EVD was placed to monitor intracranial pressure and to allow for rapid intervention if necessary. The patient was maintained on mechanical ventilation due to the high peak airway pressures required to maintain normal intracranial pressure. The patient’s clinical condition deteriorated rapidly, with new onset seizures and progressive worsening of his headache.

The patient’s Glasgow Coma Scale (GCS) score dropped to 3, indicating severe brain injury. The patient was transferred to the intensive care unit (ICU) for further management.

The patient was diagnosed with tension pneumocephalus based on the imaging findings and clinical presentation. The patient was treated with emergent surgery, with the goal of evacuating the trapped air and reducing intracranial pressure.

Conclusion

Tension pneumocephalus is a rare but deadly clinical condition that requires prompt recognition and intervention to prevent mortality. Early detection and prompt management of tension pneumocephalus can significantly improve patient outcomes. Patients with tension pneumocephalus require close monitoring, aggressive management, and a multidisciplinary approach to ensure optimal outcomes.

References


This page contains references in the text to help readers find additional information on the topic of tension pneumocephalus. These references include journal articles, books, and other scholarly sources that can provide further insights into the condition and its management.