

PNEUMOCEPHALUS

- In an infant with Ohtahara Syndrome -

- A Case Report -

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Introduction

Venous air embolism (VAE) is a recognized complication in neurosurgery. Air entry occurs when there is subatmospheric pressure in open non-collapsible venous channels. Schmitt et al. showed that VAE, as detected by transoesophageal echocardiography, occurred in 44% of adult patients with position change at the end of neurosurgery¹. The authors concluded that VAE after skin closure might be the reason for hemodynamic deterioration immediately after neurosurgery.

Case Report

A 22 weeks premature, five months old infant with Ohtahara syndrome (Early Infantile Epileptic Encephalopathy), underwent a right hemispherectomy. The patient remained hemodynamically stable through the case with balanced fluid input and output. At the end of surgery, hemoglobin (Hb) was 9.7 g/dl. Following skin closure, the upper body of the patient was raised and lowered several times to apply the surgical dressing to the head. This was associated with a sudden drop in CO₂ by capnogram, loss of blood pressure measurements, weak peripheral pulse, and a sinus bradycardia. After resuscitation with vasopressors and 10

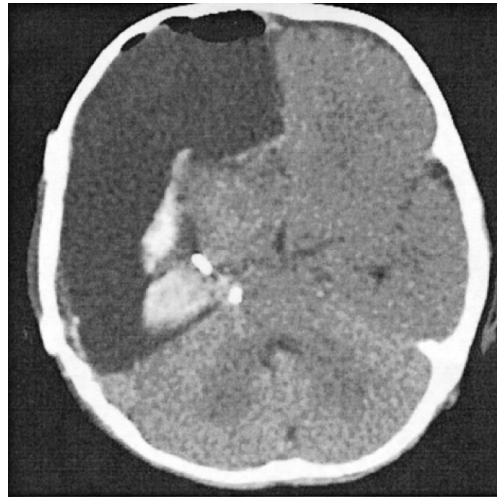
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ml/kg of packed red blood cells, the patient responded with a return of pulse and CO₂ by capnogram. A head computed tomography scan (CT Scan) showed a large pneumocephalus and blood within the ventricular system (Fig. 1). The right temporal horn of the ventricle appeared enlarged and filled with blood products.

Fig. 1
Brain CT scan showing a large pneumocephalus and blood within the ventricular system



On arrival to the ICU, ABG was pH 7.43/pCO₂ 26.5/pO₂ 322/BE-5/HCO₃ 18/O₂ sat. 100% with Hb value of 12 g/dl and electrolytes within normal limits. The patient was weaned from ventilator support the following day and the recovery was uneventful.

Discussion

The degree of change of head positioning that may be associated with VAE has not been documented in the pediatric population. Children experience greater hemodynamic derangements from VAE, and are more difficult to treat than adults². The endotracheal tube was intentionally disconnected for brief periods during dressing application and the patient was intermittently apneic and then manually ventilated. It is uncertain to what extent this may have the physiologic consequence equivalence of

PEEP release in affecting air distribution and interatrial pressure gradients. Hypovolemia has been proposed as a predisposing factor to the occurrence of VAE³. A possible explanation may be an acute intracranial blood loss after skin closure; however, this was not associated with tachycardia, and in a state of isolated anemia; infant increase their cardiac output. The presence of a large pneumocephalus with an area of hematoma suggests that there were open vessels and that air may have been released into the circulation with position change⁴.

VAE after skin closure may result from pneumocephalus formation. This should be suspected if hemodynamic deterioration is precipitated by sudden change in positioning after neurosurgical procedures in infants.

References

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