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Images in Anesthesiology: Pneumocephalus Resulting from Basilar Skull Fracture

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BASILAR skull fractures are commonly encountered in the trauma setting. Although warnings against nasal instrumentation for the purposes of airway management are commonplace, anesthesiologists may fail to appreciate the risk of pneumocephalus when positive airway pressure is applied.

The accompanying computerized tomography image (fig.) is a coronal view of the head obtained from a patient experiencing multiple facial injuries. Due to extensive disruption of the cribriform plate (arrowheads), air traversed the skull base and entered the cranial vault. Tension pneumocephalus developed as evidenced by the leftward midline shift of the brain and compression of the left cerebral hemisphere.

Depending on the size and patency of the orifice originating at the fracture line, a conduit between the nasopharynx and the cranial vault as demonstrated in the image may develop. Pneumocephalus may occur passively as air enters the cranium due to cerebrospinal fluid leakage.¹ If the defect functions as a one-way valve, tension pneumocephalus may

arise. In the image, the soft-tissue prominence crossing the fracture line likely functioned in this manner (*long arrow*). Positive airway pressure as may occur with bag-mask ventilation or continuous positive airway pressure could predispose to the development of tension physiology by augmenting airflow across the bony defect.

The possibility of introducing air into the cranium should be considered when contemplating assisted ventilation for patients with known or suspected basilar skull fractures.^{2,3} Although evidence is lacking, rapid-sequence induction/intubation may provide a means of avoiding positive pressure application to the fracture site.

Competing Interests

The authors declare no competing interests.

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