G82 Fatal Accidental Intravascular Injection of Air in Infants

Angela R. Wetherton, MD and Tracey S. Corey, MD, Office of the Chief Medical Examiner, 810 Barret Avenue, Louisville, KY 40204*

After attending this presentation, attendees will have reviewed cases of fatal accidental intravascular injection of air in infants. The importance of a thorough scene investigation, review of medical records, and complete postmortem examination in sudden death will be highlighted – even those occurring in the hospital.

This presentation will remind the forensic pathologist to consider this type of event in sudden death of hospitalized infants.

Air embolism may be difficult to diagnose in any age group. A review of the literature indicates that air embolism in infants may occur as a complication of ventilator therapy in hyaline membrane disease, during neurosurgical procedures, and as a complication of nasal continuous positive airway pressure (CPAP). To our knowledge, there are no reported cases of fatal accidental intravascular injection of air in infants. We report three such cases.

Case 1: A 29-week estimated gestational age baby boy was admitted to the neonatal intensive care unit (NICU) with a diagnosis of prematurity. At eleven hours of age he suffered a cardiac arrest. A chest radiograph during the unsuccessful resuscitation effort was suggestive of intracardiac and portal air. The nurse stated that she had mistakenly injected 10 ml of air into the arterial line as she attempted to "clear" the nasogatric gavage tube. A postmortem examination revealed intracardiac and intravascular air.

Case 2: A 30-day-old, former premature infant boy was admitted for observation for difficulty breathing. Shortly after the placement of an IV line, he developed facial cyanosis followed by respiratory arrest and a full code, from which he could not be resuscitated. Postmortem examination revealed no cause of death. Following up on information obtained through unsolicited telephone calls to the OCME, additional historical information obtained via deposition indicated that the intravenous (IV) line tubing had not been flushed prior to initiating the IV line. An "air bubble" was subsequently noted in the tubing, and the tubing was flushed. Immediately after re-initiation of IV fluids through the flushed line, the baby decompensated and died. The autopsy findings, historical information, and temporal sequence of events were consistent with death arising from an air embolus introduced through the IV tubing.

Case 3: A 31 week gestational age infant boy was admitted to the NICU for prematurity. At 43 days of age, in a time sequence shortly after receiving a "routine" replacement transfusion of red blood cells and a scheduled gavage feeding, the baby suffered an acute decompensation, with bradycardia and abdominal distension. Chest radiographs performed during the code revealed massive intracardiac air. An autopsy provided no significant, potentially lethal, pathologic process. The clinical presentation, radiographic findings, and pathologic findings were consistent with an exogenous source of air being introduced into the vascular system. The exact source of the exogenous air has not been clearly elucidated to date.

Air embolism presents a diagnostic challenge in adults, and is even more difficult to diagnose in infants. A thorough review of case information including specific nursing activities around the time of decompensation may suggest air embolism as a possibility. Review of radiographs taken during resuscitation may document the air embolus. Extensive follow-up may elucidate possible sources of exogenous air. These cases highlight the importance of a thorough scene investigation, review of medical records, and complete postmortem examination in sudden death – even those occurring in the hospital.

Air Embolus, Infants, Accident

 ** Presenting Author*