Failure to Ventilate Due to Glass Ampule Fragment Occlusion of the Breathing Circuit

To the Editor:—Cut fingers from opening glass ampules are common, and various devices have been described to facilitate their opening. We experienced a case of acute airway obstruction due to a glass ampule fragment lodged within the elbow of the anesthesia breathing circuit after the elbow was used to open an ampule of propofol.

A 23-yr-old healthy patient presented for orthopedic surgery. A machine check was performed during room setup. During pre-oxygenation, reducing mask pressure on the patient’s face relieved his agitation. After intravenous induction, mask ventilation was difficult. After the establishment of neuromuscular blockade, the vocal cords could not be visualized during direct laryngoscopy. Mask ventilation became impossible, and arterial oxygen saturation decreased. Endotrachial intubation was performed without visualization of the larynx. Airway pressures were high, breath sounds were inaudible. EtCO₂ was absent, and the tube was removed. An attempt to provide transtracheal jet ventilation was complicated by subcutaneous emphysema and was abandoned. A third attempt at laryngoscopy and endotracheal intubation was unsuccessful, and mouth-to-tube ventilation was ineffective. Intermittent positive pressure ventilation (IPPV) was initiated with a bag-valve device. Inspection of the anesthesia breathing circuit showed a glass ampule fragment lodged in the elbow connector (Fig. 1). Controlled ventilation with the anesthesia breathing circuit was resumed after removal of the glass.

Our investigation disclosed that after preanesthetic checkout, the breathing circuit elbow connector was used to open a propofol ampule. In a similarly described mishap, airway obstruction did not develop until IPPV was initiated after the establishment of neuromuscular blockade. Positive pressure ventilation worsens the impaction of the glass fragment and makes ventilation with the circuit difficult or impossible.

The intratracheal placement of the endotracheal tube, during the third laryngoscopy, was confirmed by visual inspection. Our ability to provide endotracheal ventilation by mouth and then with an auxiliary device was critical to the diagnosis and management of this scenario. It ruled out patient airway obstruction and implicated the anesthesia circuit as the cause of this failure to ventilate. Others have confirmed its use in similar emergency airway scenarios.

We recommend that:

- When an elbow connector is used to open a glass ampule, the connector should not be an integral part of the anesthesia breathing circuit.
- When patients complain of difficulty breathing through the circuit or become agitated after mask placement, the resistance to breathing through the circuit should be checked.
- The availability of a machine-independent ventilatory device should be confirmed before the induction of anesthesia.

Bernard P. Gallacher, A.B., M.D.C.M., C.C.E.P., F.R.C.P.C.
Maryann Kelly
Ricardo R. Mora
Department of Anesthesiology
Baylor College of Medicine
6550 Fannin Street, Suite 1003
Houston, Texas 77030

References


(Accepted for publication April 24, 1997.)