

- of the amniotic membranes and/or infection in the mother. *Pediatrics* 31:608-622, 1963
4. Wright WC Jr, Ank BJ, Herbert J, Stiehm ER: Decreased bactericidal activity of leucocytes of stressed newborn infants. *Pediatrics* 56:579-584, 1975
 5. Christensen RD, Rothstein G: Exhaustion of mature marrow neutrophils in neonates with sepsis. *J Pediatr* 96:316-318, 1980
 6. Weston WL, Carson BS, Barkin RM, Slater GD, Dustin RD, Hecht SK: Monocyte-macrophage function in the newborn. *Am J Dis Child* 131:1241-1242, 1977
 7. McCracken GH Jr, Eichenwald HF: Leukocyte function and the development of opsonic and complement activity in the neonate. *Am J Dis Child* 121:120-126, 1971
 8. Gorbach SL, Menda KB, Thadepalli H, Keith L: Anaerobic microflora of the cervix in healthy women. *Am J Obstet Gynecol* 117:1053-1055, 1973
 9. Baker CJ, Barrett FF: Transmission of Group B Streptococci among parturient women and their neonates. *J Pediatr* 83:919-925, 1973
 10. Bruce DL: Effect of halothane anesthesia on extravascular mobilization of neutrophils. *J Cell Physiol* 68:81-84, 1966
 11. Bruce DL: Effect of halothane on experimental salmonella peritonitis in mice. *J Surg Res* 7:180-185, 1967
 12. Loftstrom B, Schildt B: Reticuloendothelial function under general anesthesia. *Acta Anaesthesiol Scand* 18:34-40, 1974
 13. Munson ES, Eger EI II, Bowers DL: The effects of changes in cardiac output and distribution on the rate of cerebral anesthetic equilibration: Calculations using a mathematical model. *ANESTHESIOLOGY* 29:533-537, 1968
 14. Sawyer DC, Eger EI II, Bahlman SH, Cullen BF, Impelman D: Concentration dependence of hepatic halothane metabolism. *ANESTHESIOLOGY* 34:230-235, 1971
 15. Cohen EN, Chow KL, Mathers L: Autoradiographic distribution of volatile anesthetics within the brain. *ANESTHESIOLOGY* 37:324-331, 1972

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An Unusual Complication of Esophageal Obturator Airway (EOA)

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The esophageal obturator airway (EOA) is recognized as part of emergency airway treatment, especially by paramedical personnel outside the hospital.¹ Improper utilization of the EOA may result in trauma² to the soft tissues of the airway or esophagus. Inadequate oxygenation has occurred secondary to the airway being located in the trachea instead of the esophagus.³ Decreased ventilation has been reported with the EOA and its mask as compared with using an anesthesia mask and oropharyngeal airway.⁴

We describe an unusual airway complication during the use of an EOA resulting in gastric placement of the device and difficulty with ventilation secondary to soft tissue obstruction.

REPORT OF A CASE

A 75-year-old man was admitted to the emergency department of the hospital with the diagnosis of cardiac arrest at home approximately 40 min prior to admission. Cardiopulmonary resuscitation (CPR) was started at home prior to the arrival of the paramedics. The diagnosis of ventricular fibrillation was followed by ventilation and insertion of

an EOA with CPR being continued. Drugs and defibrillation were administered via radio command.

The ventilation was reported difficult due to poor face seals with the standard EOA mask. Therefore, a bag/mask unit of conventional type was applied over the EOA providing a better seal with the patient's face. Upon arrival at the emergency department, the paramedic reported increased difficulty in ventilating the patient. An endotracheal tube was inserted without difficulty. The EOA was not observed except for the pilot tube, which protruded from the hypopharynx. Ventilation of the lungs then was accomplished successfully, as evidenced by bilateral breath sounds by auscultation.

A roentgenogram was obtained, and the tip of the endotracheal tube was in an appropriate position above the carina and within the trachea. The EOA was noticed with the tip located in the stomach below the diaphragm (fig. 1). The upper limit of the EOA was noted to be somewhere in the area immediately behind the larynx with the proximal end curving into the soft tissues on the left side of the esophagus and pharynx. The pilot tube was visible at the corner of the mouth, although the main body of the EOA was not visualized with the aid of a laryngoscope.

DISCUSSION

The esophageal obturator airway has become an accepted part of airway management for paramedics throughout the United States. When used properly, it provides occlusion of the esophagus as well as access to the pharynx for ventilation. The esophageal occlusion is accomplished by a blind-ended tube with inflatable cuff which is inserted into the esophagus and the cuff inflated. A specially designed face mask is attached to the upper portion of the tube and latches into position over the esophageal obturator, preventing descent of the tube during ventilation.

Since the mask has a rigid plastic form with an inflatable plastic rim, effective seals with the face as nec-

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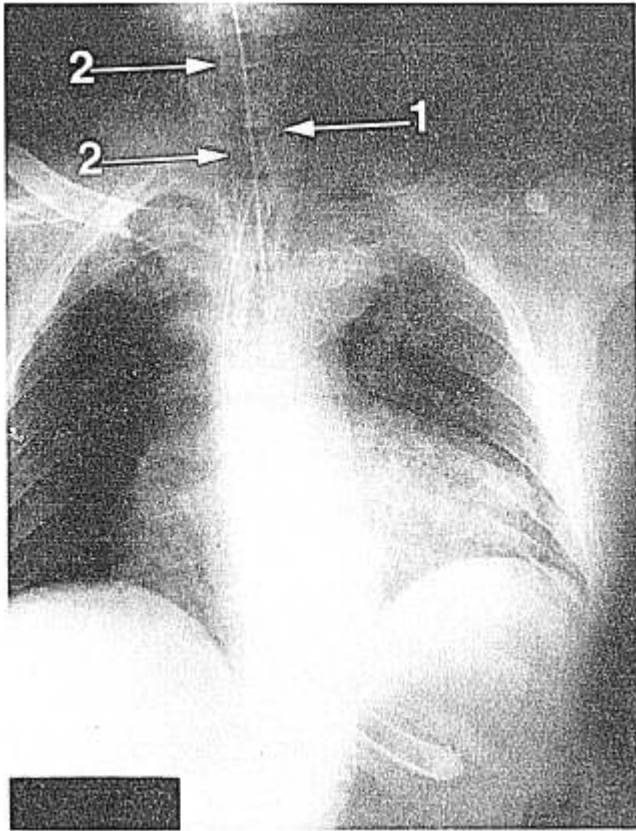


FIG. 1. Chest roentgenogram revealing the esophageal obturator airway with the distal tip in the stomach below the diaphragm and the proximal tip to the left of the patient's larynx (arrow #1). An oral endotracheal tube is in position within the trachea (arrow #2).

essary for adequate positive pressure ventilation frequently are difficult. In order to bypass this problem, some field personnel tend to place conventional malleable masks over the obturator airway to accomplish adequate ventilation. The reasoning has been that the EOA will remain in the esophagus and continue to provide protection against gastric aspiration, while the portion of the obturator in the pharynx will act as a con-

ventional oropharyngeal airway, providing access of oxygen and ventilation to the trachea and lungs.

In our case, the EOA slipped further into the stomach during cardiac massage, making ventilation difficult secondary to the proximal end of the tube slipping below the tongue into the area of the larynx and upper esophagus. This resulted in upper airway obstruction secondary to tongue and soft tissue occlusion.

An additional complication of distal displacement of the EOA is regurgitation of gastric contents. This potential develops when the cuff leaves the esophagus and slips into the stomach. This negates one of the two functions of the EOA, namely, prevention of regurgitation of gastric contents by balloon obstruction of the esophagus.

The EOA is intended as a temporary airway adjunct until endotracheal intubation can be accomplished. Inappropriate use or injudicious removal of the EOA may result in airway obstruction, gastric aspiration, and the attendant hypoxia and hypoventilation. The complication reported here resulted from an attempt to modify the EOA/mask unit. This complication previously has been reported in a case report of another patient following a gunshot wound to the head.⁵ All hospital personnel should be aware of the possibility of this complication and all users of EOAs of the hazard of modifications of the obturator airway from the manufacturer's intended use.

REFERENCES

1. McIntyre, KM: Standards and guidelines for cardiopulmonary resuscitation (CPR) and emergency cardiac care (ECC). *JAMA* 244:480-481, 1980
2. Carlson WJ, Hunter SE, Bonnabeau RC: Esophageal perforation with obturator airway. *JAMA* 241:1154-5, 1979
3. Yancy W, Waers R, Kamajian G, Derovanesian J: Unrecognized tracheal intubation: A complication of esophageal obturator airway. *Ann Emerg Med* 9:18-20, 1980
4. Bryson TK, Benemof JL, Ward GF: The esophageal obturator airway. *Chest* 74:537-9, 1978
5. Stewart RD, Packer CR: Iatrogenic intragastric "foreign body". *Chest* 80:244, 1981