

Esophageal Intubation of an Infant

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A 68-day-old former 30-week infant presented with listlessness, apnea and bradycardia. The patient was intubated for airway protection. After intubation, breath sounds were auscultated bilaterally and a Pedi-Cap carbon dioxide detector had color change from purple to yellow. A nasogastric tube (NGT) was placed and a post-procedural chest radiograph was obtained (Figure).

There are several features of esophageal intubation: low

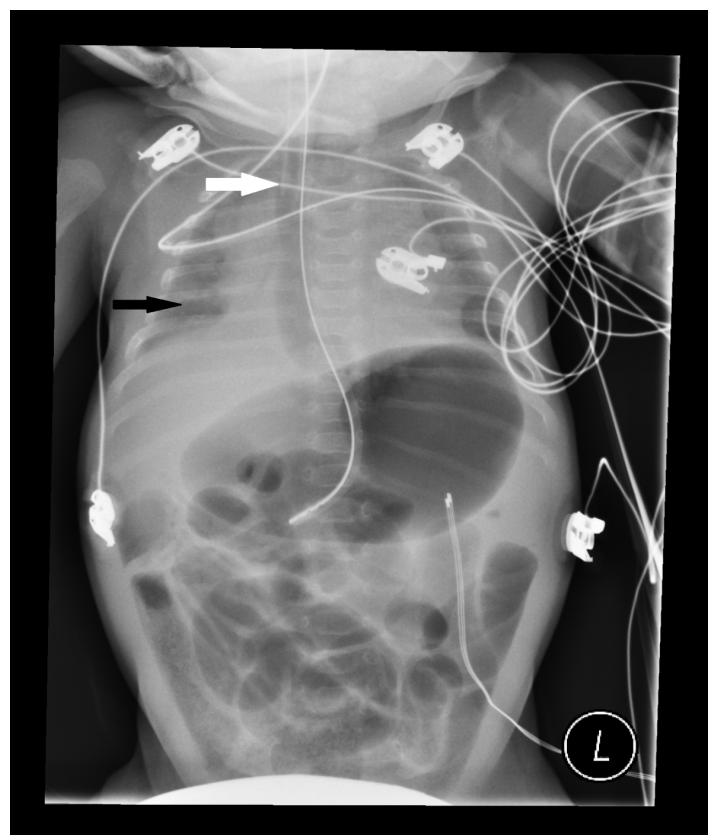


Figure. Infant with endotracheal tube in the esophagus; nasogastric tube present in the stomach. White arrow indicates endotracheal tube tip. Black arrow indicates low lung volumes.

lung volumes, esophageal and gastric distention despite NGT placement and juxtaposition of the endotracheal tube (ETT) relative to the NGT.¹⁻² Other findings of esophageal intubation not seen here are identification of the ETT distal to the carina or outside of the tracheal-bronchial air column.³ Due to high success rates of endotracheal intubation in the emergency department,⁴⁻⁵ these findings are rare and may be overlooked. In this case, misleading clinical evidence was obtained through auscultation of bilateral breath sounds, visualization of endotracheal tube condensation, positive change on the carbon dioxide colorimeter and post-procedural hemodynamic and oxygenation stability. Previous literature, however, has demonstrated false-positive colorimetric change from swallowed air with pre-intubation positive pressure ventilation,⁶⁻⁷ hence the importance of radiographic identification of ETT location. In this patient, esophageal intubation was recognized after continuous capnography revealed absence of waveform.

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REFERENCES:

1. Bagshaw O, Gillis J, Schell D. Delayed recognition of esophageal intubation in a neonate: role of radiologic diagnosis. *Crit*

- Care Med.* 1994;22(12):2020-2023.
2. Dittrich KC. Delayed recognition of esophageal intubation. *CJEM.* 2002;4(1):41-44.
 3. Salem MR, Baraka AS. Confirmation of endotracheal intubation. In: Hagberg CA, ed. *Benumof and Hagberg's Airway Management, Third Edition.* Philadelphia: Saunders. 2013:657-682.
 4. Sagarin MJ, Barton ED, Chng YM, et al. National Emergency Airway Registry Investigators. Airway management by US and Canadian emergency medicine residents: a multicenter analysis of more than 6,000 endotracheal intubation attempts. *Ann Emerg Med.* 2005;46(4):328-336.
 5. Walls RM, Brown CA 3rd, Bair AE, et al. NEAR II Investigators. Emergency airway management: a multi-center report of 8937 emergency department intubations. *J Emerg Med.* 2011;41(4):347-354.
 6. Gomes SB, Mychaskiw G 2nd. Failure of the Easy Cap II CO2 detector to indicate esophageal intubation. *J Clin Anesth.* 2012;24(4):352-353.
 7. Hughes SM, Blake BL, Woods SL, et al. False-positive results on colorimetric carbon dioxide analysis in neonatal resuscitation: potential for serious patient harm. *J Perinatol.* 2007;27(12):800-801.