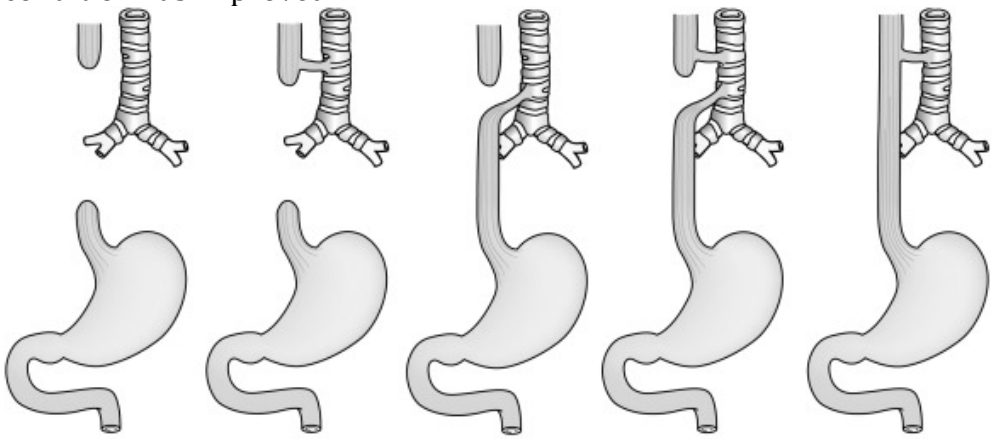
Esophageal Atresia and Tracheoesophageal Fistula

Background:

Esophageal atresia (EA) is the most frequent congenital anomaly of the esophagus with an approximate incidence of 1 in 4000 neonates. More than 90% of affected individuals have an associated TEF. The most common form of EA/TEF is type C, representing 90% of all cases of this anomaly. The table below shows the different variants. 25% of more of infants with EA have other congenital anomalies, most often the VATER association (vertebral defects, imperforate anus, TEF, and renal dysplasia) or VACTERL association (VATER plus cardiac and limb anomalies). Repair of a TEF is urgent, usually within the first 24 hours of birth to minimize risk and complications of aspiration. However, some neonates may exhibit significant associated anomalies with severe lung disease or cardiac defects. If the neonate's condition is considered too unstable to allow a complete primary repair, a staged approach with an initial gastrostomy under local anesthesia until the neonate's condition has improved.



Anesthesia Management:

Before the procedure endotracheal intubation is avoided is possible because of the potential to worsen distention of the stomach, leading to gastric rupture or impairment of ventilation and venous return. Once brought down to the OR, any form of induction that allows for spontaneous ventilation whether be inhalation or intravenous should be performed. If IV induction route is chosen, care must be exercised to minimize peak inspiratory pressure and potential gastric distention, especially in the absence of gastrostomy. Proper placement of the ETT is critical; it should be above the carina but below the TEF. It is important that the ETT be above

the carina because the right lung is compressed during thoracotomy. If the tube is main stemmed in the right main bronchus, this may lead to precipitous severe hypoxemia. Once the fistula is identified by bronchoscopy, a Fogarty catheter is placed through the fistula into the stomach, this allows lung isolation before positive pressure ventilation is begun. Anesthestic technique usually consists of low dose volatile anesthetic and opiates, muscle relaxants may be used if ventilation is deemed satisfactory. Avoid nitrous oxide, which can lead to worsening of the gastric distention. Close communication between the Anesthesiologist and Surgery is imperative because lung retraction may impair ventilation and cause airway obstruction, it can also compress major vessels and the heart leading to rapid decline is blood pressure. Intermittent release of the lung and trachea may be necessary to improve oxygenation and ventilation. An arterial line should be placed to monitor ABGs frequently and monitor blood pressure closely.

Extubation:

Extubation is preferable but usually not feasible due to tracheomalacia and aspiration pneumonitis from aspiration of gastric secretions. A full-term infant who has undergone an uneventful simple ligation of a TEF would be the best candidate for immediate extubation.

Reference:

Hines, Roberta L. *Stoelting's Anesthesia and Co-Existing Disease.* Philadelphia: Elvsevier Saunders, 2012. p597-598.