Fiberoptic and Thoracoscopic Visualization of a Rare Double TEF

Introduction
Repair of tracheoesophageal fistula (TEF) is a common indication for non-elective surgery in the neonatal period. The aim of this poster is to describe the intraoperative diagnosis and management of a rare type of TEF.

Case
- A 35 week female with CHARGE syndrome was intubated at birth for copious secretions, gas-filled intestines, and inability to pass an orogastric tube, later found to be due to a TEF.
- At 3 days old, she was brought to the operating room, still intubated, for thoracoscopic TEF repair. A single TEF between the trachea and distal esophageal pouch, the most common type of TEF, was suspected.
- Following intravenous induction of anesthesia, the uncuffed tracheal tube was exchanged for a 3mm cuffed tube. A fiberoptic bronchoscope was passed through the ETT and used to visualize the distal fistula approximately 1 cm above the carina and no proximal fistula was noted. The ETT was advanced past the fistula and the cuff was inflated.
- Following thoracoscopic ligation of the distal TEF, peak inspiratory pressure unexpectedly rose. Fiberoptic bronchoscopy revealed that the tracheal tube had migrated into the fistula pouch. Given that the fistula was now ligated, we repositioned the tube just below vocal cords.
- With repositioning, inexplicable loss of tidal volume occurred, in spite of a ligated fistula and intact ETT cuff. Repeat bronchoscopy was performed by the anesthesia team to investigate the reason for loss of ventilator gas, at which point a more proximal, H-type TEF was discovered.
- The surgeons proceeded to ligate the proximal fistula, which immediately restored adequate ventilation.

Conclusion
While uncommon, undiagnosed second TEs have the potential to compromise intraoperative ventilation as well as long term recovery. Evaluation of the entire course of the trachea or upper esophageal pouch should part of the initial TEF management. Intraoperative flexible bronchoscopy is a valuable technique in intraoperative management of TEF.