Introduction:  Acquired bronchoesophageal fistulas are rare occurrences in the pediatric population. These conditions necessitate significant anesthetic planning and they present many challenges for the anesthesiologist. We present a case of bronchial intubation in a patient with acquired, recurrent bronchoesophageal fistula.

Case: The patient is an 11 year old male with a complicated past medical history. He is s/p slide tracheoplasty from a large left mainstem bronchoesophageal fistula caused by a foreign body in his esophagus. This procedure was successful however he had bronchiectasis in his left lower lobe resulting in recurrent infections requiring stents and dilations in his left mainstem bronchus. It was decided to perform a pectus bar insertion to relieve compression of his bronchus. The procedure was completed uneventfully.

Discussion: Acquired bronchoesophageal and tracheoesophageal fistulas are rare occurrences; however, they can have devastating consequences for patients and are difficult to manage in the operating room. In patients who have a fistula the preferred approach to repair the defect is a primary closure. Depending on the size of the defect this may not be possible in which case a flap or tracheal resection may be necessary. Our patient had a slide tracheoplasty with good results to repair his initial fistula. Recurrence after this type of repair is very rare and was likely complicated by the fact that he had intra-bronchial stents.

Patients with a bronchoesophageal or tracheoesophageal fistula present at high risk for general anesthesia. With ongoing fistulas patients present with chronic aspiration. Therefore, it is important to appropriately treat any chronic pulmonary infection present. It is important to avoid positive pressure ventilation prior to intubation due to concerns of aspiration. The ETT should be placed below the level of the fistula; therefore, fiberoptic intubation may be necessary, especially with a bronchoesophageal fistula. Given a history of lung injury with chronic aspiration and the need for lung isolation in some cases, adequate ventilation may be difficult. It is important to consider alternative methods to ventilate these patients, including using multiple ETT or passive oxygenation through a tube with a leak.

Barotrauma is also a concern in these patients. It can be difficult to maintain adequate tidal volumes with the patient’s pathology. Atelectasis is also a concern that contributes to both poor oxygenation and poor ventilation. This is a patient with a rare, recurrent bronchoesophageal fistula visible only after expansion of the chest by a Nuss bar. The case was difficult due to recurrent infections resulting from a fistula that was not detectable, reduction in lung volume ventilated due to need for isolation, and the desire to limit airway pressures to limit risk for aspiration and barotrauma to ventilated lung segment.

References:
Ford JM, Shields JA. Selective bilateral bronchial intubation for large, acquired bronchoesophageal fistula. AANA J 2010;80:49-53

Bronchoscopy was performed on POD 2 which identified a bronchoesophageal fistula. At this time, a 5.0 cuffed endotracheal tube (ETT) was passed over a fiberoptic bronchoscope into the right mainstream bronchus. The patient was suctioned and saline lavaged through a 3.5 cuffed ETT that was subsequently passed through the tracheal stoma into the left lower lobe distal to the bronchoesophageal fistula.

Figure 1: Identified by arrow A the patient had a ETT through the tracheostomy into the left lower lobe. Also, the patient had an oral ETT passed into the right mainstem bronchus as identified by arrow B.

Figure 2: A Y-shaped tracheobronchial stent is visible as indicated by arrow C with improved right lung aeration over Figure 1.

Later on POD 2 the patient had worsening oxygenation and was taken to the OR for a silastic stent placement. Prior to the stent being placed a Sengstaken tube was placed into his esophagus and inflated to stop the air leakage. A stent was then placed from the trachea into both the left and right mainstream bronchus temporarily closing the fistula. After this was placed there was no detectable leak into the esophagus.