

Case Report – Minimally invasive endoscopic repair of recurrent tracheo-esophageal fistula using chemocauterization with trichloroacetic acid

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Introduction and Objective

- Tracheoesophageal fistula (TEF) is a common malformation, occurs one in every 2500 – 4500 newborns¹. Recurrent TEF (RTEF) can occur between 5 and 14% of cases².
- Classical symptoms of TEF include coughing, abdominal distention, repeated cyanosis, and respiratory infections³.
- Diagnosis is confirmed by barium swallow esophagram and bronchoscopy³.
- Traditionally, TEF was repaired in an open thoracotomy approach if it is placed under T3 level and cervicotomy approach if placed above T2 level⁴.
- In the last decade or two, minimally invasive endoscopic approach became an alternative to open surgery resulting in fewer complications^{5,6}.
- This is a case report of a 17-year-old patient with VACTERL syndrome who underwent repair of H-type tracheoesophageal fistula (TEF) as an infant.
- He was hospitalized for pneumonia and underwent CT evaluation of his chest which showed possible recurrent TEF.
- Although there was no definitive leakage demonstrated on esophagram, he was taken to OR for bronchoscopy and chemocauterization of recurrent fistula with trichloroacetic acid (TCA).

Methods

- Case report of a serial chemocauterization of recurrent fistula with TCA, performed at a tertiary medical center in Richmond, Virginia.
- Under general anesthesia, a rigid bronchoscope with a 0° telescope was used to localize the TEF. 50% TCA soaked pledgets were applied on the site of TEF until appropriate mucosal chemocauterization was achieved.

Surgical Technique

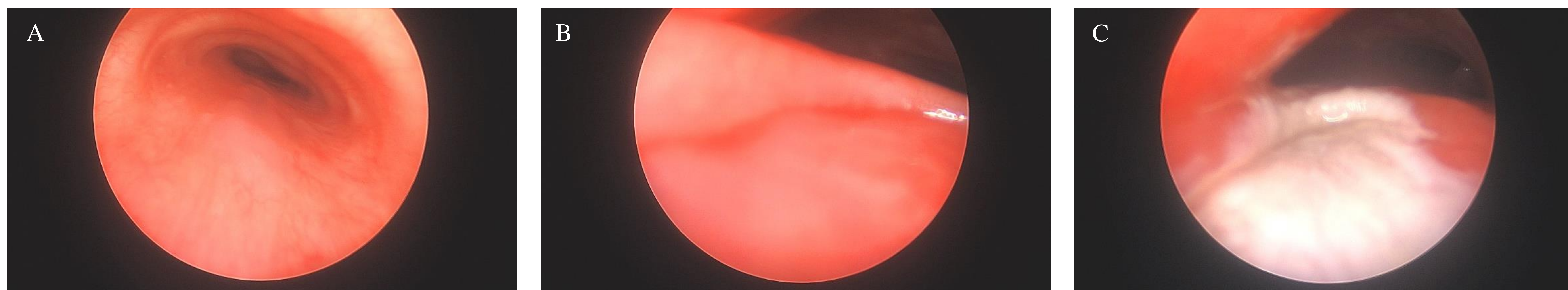


Figure 1: Initial evaluation of trachea showing significant tracheomalacia (A) with approximately 5mm blind pouch at the site of previous TEF repair (B). Appropriate chemocauterization achieved by applying 50% TCA soaked pledgets at the site of TEF (C).

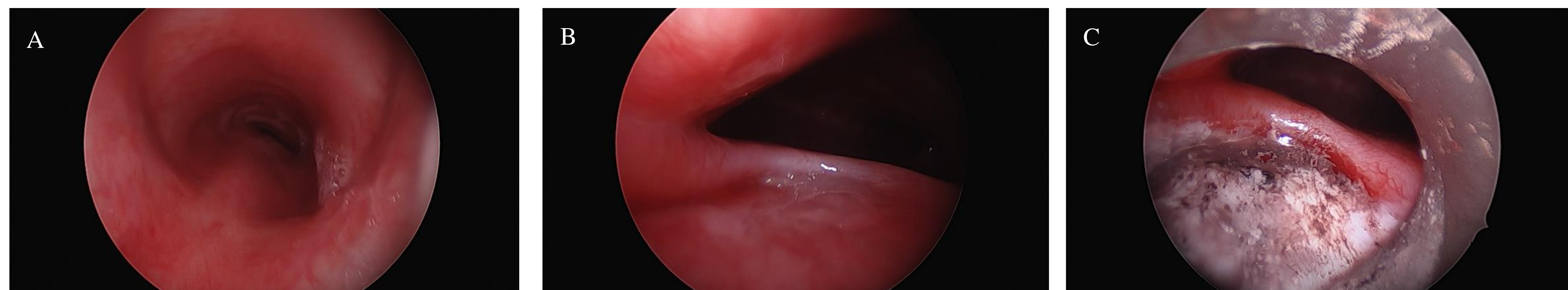


Figure 2: Second look one month after initial chemocauterization with TCA (A). Small flap in the posterior left trachea was again noted, less obvious and less shallow in depth than on the previous evaluation (B). Appropriate chemocauterization achieved by applying 50% TCA soaked pledgets at the site of TEF (C).

Discussion

- The first successful reported treatment of TEF using endoscopy was documented by Gnanietz and Krause in 1975⁷. Since then, several techniques have been developed, such as using interposing tissue (Histoacryl, Fibrin), de-epithelialization (using electrocautery, sclerosant, and laser), or a combination of both⁹⁻¹².
- Studies have shown an overall success rate of around 60% with endoscopic treatment for RTEF and congenital TEF, typically requiring an average of 2.1 procedures per patient¹³⁻¹⁵.
- In 2008, Sung et al. reported a preliminary study using a novel endoscopic approach with 50% TCA as a sclerosant, showing excellent outcomes¹⁶.
- TCA, commonly used for chemical skin peels, is considered safe when used in small amounts for this purpose, as it is neutralized by tracheobronchial secretions and does not pose a risk to the airway. Despite the need for repeated general anesthesia, this procedure appears to be secure, effective, and reproducible.
- This case report support the effectiveness reported by Sung in 2008. The use of 50% TCA for chemocauterization carries a low risk of mucosal edema and allows for outpatient surgery without major complications. To further validate its efficacy and safety, larger series and prospective studies are indicated.

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