[NM-189] Management of TEF in a 29 Week Old, Extremely Low Birth Weight Neonate with Tetralogy of Fallot (TOF)

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Introduction

Esophageal atresia (EA) with or without tracheoesophageal fistula (TEF) occurs in approximately 1 in 4000 live births.1 Advancements in multiple disciplines have shifted the mortality rates from 70% in the 1940s to less than 10% today.1 However, birth weight <1500g and concurrent congenital heart disease (CHD) have been identified as predictors of increased morbidity and mortality in these patients.1 We present the complex airway and anesthetic management of a premature female with TOF and distal TEF.

Case Report

Our patient was an 810g female born at 29 weeks gestation. The patient was intubated at birth due to prematurity and TOF. She was subsequently diagnosed with EA on day of life 1.

A staged surgical procedure was planned due to the patient's comorbidities. General anesthesia was achieved with sevoflurane via a 2.5 uncuffed OETT and neuromuscular blockade with rocuronium. During retrograde fistula intubation, via surgically placed gastrostomy, there were several desaturation episodes requiring 100% oxygen, 5% albumin, fentanyl, and phenylephrine boluses. The decision was made to delay ligation. The gastrostomy tube and Fogarty catheter were sutured in place to improve ventilation and minimize aspiration. She remained hemodynamically stable and was extubated to CPAP on POD #4.

On DOL 25 , weighing 1.2 kg, the patient returned to the OR after serial CXRs revealed that the Fogarty catheter had dislodged and ventilation was becoming more problematic. The plan was to ligate the fistula via right thoracotomy. Spontaneous ventilation was maintained with a 0.4 mcg/kg/hr Dexmedetomidine infusion as a 4Fr Fogarty catheter was placed into the fistula via an antegrade approach using fluoroscopic guidance and the patient was intubated with a 3.0 uncuffed ETT adjacent to the Fogarty catheter. The patient had several desaturation episodes which were treated with small boluses of albumin and phenylephrine. The ligation was successfully completed and the patient was transported to NICU where she remains on ventilator support.

Discussion

This case illustrates the difficulties associated with management of TEF in a patient with CHD and extremely low birth weight. Reeves described the technique of antegrade fistula occlusion nearly two decades ago2. To our knowledge, however, this is the smallest infant with successful use of this challenging technique. This allowed improved ventilation in a patient with potential R-L shunting from TOF, poor lung compliance, and one lung ventilation. The first stage of this patient's TEF repair was made possible with this technique and its use should be more widely considered in the management of similar patients.

References

1. Diaz LK et al. Tracheoesophageal fistula and associated congenital heart disease: implications for anesthetic management and survival. Paediatr Anaesth. 2005. Oct;15(10):862-9.
2. Reeves, S. Burt, N., Smith, C. Is It Time to Reevaluate the Airway Management of Tracheoesophageal Fistula? Anesthesia and Analgesia. 1995. 81: 866-869.
