

Case Report: Successful extubation of a former premature infant using Vapotherm high-flow therapy after multiple attempts using conventional methods. Raul Martinez-Gomez, RRT, Bill Lefkowitz, MD, Wilford Hall (USAF) Medical Center, Lackland AFB, TX.

Introduction: Primary interest in using the Vapotherm device remains complex, however various strategies for its use has now become a common theme during our daily Neonatal ICU rounds. This case documents Vapotherm application with a difficult-to-extubate patient. **Case Summary:** The patient is was a greater than 3 month old former 25-week twin. After a C-section, difficult resuscitation including bilateral pneumothoracies and chest-tubes, and multiple surfactant doses the baby was air-transported to our NICU. With severe chronic lung disease that had responded to multiple therapies to include steroids, the baby met extubation criteria. However, despite multiple coordinated attempts, apparent upper airway obstruction complicated by the patients lung disease prevented successful extubation to blow-by, hood, mask CPAP or standard CPAP devices necessitating re-intubation. Bronchoscopy ruled out tracheo-broncho malacia as an etiology, but significant vocal cord edema was present, despite high-dose steroids used to treat this edema. Treatment with racemic epinephrine led to transient improvement. The combination of swollen vocal cords and a granuloma on the posterior wall of the trachea led to an approximately 1x2mm airway (visualized on scope) which was only tolerated when the baby was calm, somewhat upright and with the head slightly hyper-extended. Vapotherm high-flow therapy was started at 6 LPM and 1.0 FiO₂. Over the next weeks as the swelling gradually subsided, the baby could tolerate more liberal positioning and was even able to take a first PO feed on 3 LPM flow. The baby is currently over 1 month out from extubation and on conventional nasal canula in preparation for discharge. **Discussion:** High flow therapy via the Vapotherm provides warm, humidified gas at BTSPS. Some amount of pressure is likely provided, but the apparatus is apparently much more comfortable than conventional CPAP, causing far less agitation in the baby. Unlike conventional nasal canula that is associated with nasal bleeding at flows greater than 1 LPM, the Vapotherm device seems free of this problem even at flows over 5 LPM. We feel that the Vapotherm as a non-agitating oxygen and/or pressure delivery device, in association with cautious use of sedation to prevent increased metabolic demand, prevented extubation failure, and thus ultimately helped avoid a tracheostomy. **Conclusion:** The Vapotherm provided a-traumatic high-flow supplemental oxygen and prevented reintubation or subsequent tracheostomy for this patient. OF-04-129