TRACHEAL RUPTURE DUE TO SUCTION TRAUMA IN A CRITICALLY ILL CHILD WITH CONGENITAL CARDIAC DISEASE

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Introduction:
Tracheal injuries can be devastating complications in critically ill children, especially in a ventilator-dependent patient.1,2 These injuries are multifactorial with risk factors including prematurity, decreasing patient weight and size, and mucosal fragility.1 We present a case in which tracheal rupture from tracheal suctioning resulted in intermittent inability to adequately ventilate in a critically ill, ventilator-dependent child.

Case Report:
An 18 month old boy, born at 35 weeks gestation with hypoplastic left heart syndrome, s/p orthotopic heart transplant was admitted to the cardiac intensive care unit for progressive kidney failure and fungal sepsisemia. Despite chronic immunosuppression he had suffered from multiple episodes of graft rejection. His course was further complicated by a reported tracheoesophageal fistula, respiratory insufficiency, tracheostomy placement, ventilator dependence, and severe tracheomalacia. His airway was reported as critical due to intermittent ventilation difficulties despite the artificial airway. An urgent airway assessment was performed which detected a tracheal rupture, which had resulted in a 5 cm blind pouch originating from the posterior aspect of the trachea 1 cm proximal to the carina. It was speculated that the continual movement of the tracheostomy tube between the trachea and the posterior blind pouch had caused the ventilation difficulties. The tracheal rupture was likely the result of overzealous tracheal suctioning. Ultimately, a longer tracheostomy tube was fitted to minimize ventilation into the blind pouch and further tracheal trauma by bypassing the injured site. His airway was stabilized but due to his extensive medical issues and deteriorating clinical status, care was withdrawn two weeks later.

Discussion:
Tracheal injuries are typically the result of difficult and traumatic intubations with the most common injuries being laryngeal stenosis, subglottic stenosis, tracheal rupture, subglottic cysts, and pharyngoesophageal perforation.1,3 Mechanical trauma to the trachea, outside of traumatic airway placement, may result from careless and aggressive tracheal suctioning.2 Risk factors known to contribute to mechanical tracheal injuries include oxygen toxicity, infection, vitamin deficiency, aspiration, chronic immunosuppression, amongst others.3 Awareness of these risk factors and cautious suction technique, such as suctioning to the tracheal tube tip only, reduces the incidence and severity of a distal tracheal injury. These injuries are further prevented by following additional airway management precautions such as brief and gentle suctioning, as well as use of suction catheters with a side port versus an end suction port.2 Despite multiple risk factors rendering critically ill infants more susceptible to tracheal injury, careful suctioning techniques do result in less tracheal injuries.2

References: