Inadvertent Suturing of the Endotracheal Tube to the Trachea via the Murphy Eye During TEF Repair

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Introduction: In 1941, Murphy introduced an intratracheal catheter with a side vent (“Murphy eye”) to prevent complete airway obstruction should the distal end of the endotracheal tube become occluded (1). Various complications associated with the presence of the Murphy eye have been reported, including the lodging of fiberoptic bronchoscopes (2,3) and suction catheters (4) in the Murphy eye necessitating removal of the endotracheal tube, as well as a potential complication during placement of a percutaneous tracheostomy tube (5). We report what we believe to be an unusual, if not unique, complication involving the Murphy eye following repair of a tracheoesophageal fistula in a newborn.

Case Report: A two-day-old term male presented to the operating room for repair of a type C TEF. The patient had a previously placed gastrostomy tube to water seal. Anesthesia was induced by inhalation of sevoflurane in oxygen, and the patient was intubated with a 3.5 mm uncuffed oral endotracheal tube (ETT). Fiberoptic bronchoscopy was used to identify the fistula and to position the ETT distal to the fistula but proximal to the carina. After placing the patient in left lateral decubitus position, the ETT location was reconfirmed fiberoptically. Anesthesia was maintained using sevoflurane in oxygen during spontaneous ventilation.

After identification and ligation of the fistula, cisatracurium was administered, and controlled ventilation was initiated. Within minutes, an audible inspiratory leak was noted, and the capnogram tracing disappeared. The leak was found to be originating through a disruption of the trachea proximal to the level of the fistula. The patient was manually ventilated during tracheal repair. Adequacy of oxygenation and ventilation was confirmed by maintenance of peripheral oxygen saturation greater than 90% and observation of chest excursion, since the tracheal leak precluded capnography. After 25 minutes, the trachea was repaired and mechanical ventilation was resumed. The remainder of the surgical repair was uneventful, and the patient was transferred to the newborn ICU sedated, intubated, and ventilated.

However, attempts to remove the endotracheal tube met significant resistance, such that the ETT could not be extricated from the patient. The patient returned to the operating room for diagnostic fiberoptic bronchoscopy to assess the cause for the resistance. No readily identifiable cause for the difficulty in extubation could be determined. The surgeon then extubated the patient, although this required some force.

Apparently, during repair of the trachea, a suture had been placed through the distal end of the ETT and then through the patient, although this required some force. No readily identifiable cause for the difficulty in extubation could be determined. The surgeon then extubated the patient. The patient returned to the operating room for diagnostic fiberoptic bronchoscopy to assess the cause for the resistance. No readily identifiable cause for the difficulty in extubation could be determined. The surgeon then extubated the patient.

The patient was observed closely for several minutes in the operating room for signs or symptoms of respiratory distress. He was transferred back to the intensive care unit in stable condition. The remainder of the patient’s post-operative course was uneventful, and the patient was discharged to home nine days later.

Discussion: Although proper positioning of the endotracheal tube in TEF repair is addressed in textbooks, implications of the Murphy eye are less frequently mentioned. Some authors suggest an anterior orientation of the ETT bevel to avoid ventilation of the fistula, while others suggest a posterior orientation to reduce the likelihood that the endotracheal tube will intubate the fistula. Most authors point out the need to vigilantly avoid right bronchial mainstem migration of the endotracheal tube because the right lung is often poorly ventilated during surgical manipulation.

As such, it might be argued that the presence of a Murphy eye would be particularly advantageous in the setting of TEF repair, because one of the purposes of the Murphy eye is to maintain ventilation of the left lung during accidental right mainstem intubation. However, in 1973, Salem (6) suggested routine use of an eyeless endotracheal tube for TEF repair, presumably eliminating the risk of ventilation of the fistula via the Murphy eye. When such a tube is used in conjunction with the oft-promoted practice of turning the endotracheal tube so that the bevel faces anteriorly, the fistula, if proximal to the carina, would be effectively occluded.

In summary, we present an interesting complication involving the Murphy eye that occurred under a unique set of circumstances.

References:
1) Murphy FJ: Two improved intratracheal catheters. Anesth Analg 20:102-5, 1941