Airway Considerations in Transgender Patients: Complicated Intubation

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Introduction
Emergency airway management in the setting of trauma or critical illness can be a life-saving tool. However, even with proper technique and knowledge of airway anatomy, complications including injury to the upper aerodigestive tract and airway stenosis are common.¹,² Biological females are at higher risk of developing tracheal stenosis, but studies in the transgender population are limited. The purpose of this report is to present the case of emergency intubation in a transgender male leading to severe postintubation tracheal stenosis. The patient’s biological female anatomy likely contributed to serious tracheal injury.

Report of a Case
A 25-year-old, 5′9″, 60-kg, biologically female, male transgender patient on testosterone therapy was brought to the emergency department unconscious after being struck by a motor vehicle. First, responders reported an unsuccessful attempt to secure the airway due to jaw clenching. In the emergency department, a size 8 endotracheal tube was used to secure the patient’s airway, which remained in place for 12 days. The patient’s injuries included traumatic brain injury and pneumothorax. Following extubation, the patient had severe dysphagia, requiring placement of a percutaneous endoscopic gastrostomy tube. Noisy, labored breathing was also noted, but no additional interventions were performed. This patient had no previous history of tracheal stenosis, respiratory difficulty, or dysphagia.

The patient remained extubated in the hospital for an additional 2 weeks, and on the evening of discharge, emergency services were called to the patient’s house where responders intubated for severe respiratory distress. Traumatic intubation was achieved with a 6.0 endotracheal tube after multiple failed attempts with larger tubes. The patient was transferred to our hospital and remained intubated for 3 days.

During admission, the patient received intravenous proton pump inhibitors and underwent airway exam under anesthesia revealing severe tracheal stenosis 2 cm in length beginning 3.2 cm below the vocal fold leading edge. Excision of scarring, balloon dilation, steroid, and mitomycin C increased the luminal diameter from 6.5 to 17 mm, resolving the patient’s respiratory difficulties. Dyspnea returned within several weeks, necessitating repeat dilation 1 month from initial dilation. Surgery was performed 3 additional times at postinjury 4, 6, and 7 months (Figure 1). During this time, the patient was instructed to stop hormone therapy, but compliance was uncertain. The patient was subsequently lost to follow-up.

Discussion
This is the first report of severe tracheal stenosis developing in a transgender male after prolonged intubation with an inappropriately large endotracheal tube. Although intubation guidelines in emergency airway management exist, they do not necessarily apply to transgender patients.²,³ Cuff pressure, duration of intubation, and size of tube must be carefully managed to reduce the risk of tracheal stenosis.⁴-⁶

Tracheal stenosis is more commonly reported in females.⁵,⁶ This is attributable to 2 mechanisms. Anatomically, women’s tracheal lumens are narrower than men’s and the cuff is more likely to cause loss of regional blood flow leading to injury. Physiologically, estrogen receptors play a role in fibrotic scarring.⁵ Stimulation of estrogen receptors increases the presence of transforming growth factor β1, promoting deposition of type I and type III collagen, resulting in fibrosis.⁶ As testosterone is metabolized to estradiol, its...
administration in a biological female might predispose a patient to developing airway stenosis.

Biological sex must be considered when airway management algorithms are applied to the care of transgender persons. Further investigation into airway changes during hormone therapy as well as appropriate airway management of transgender male and female patients is warranted. Emergency first responders should be aware of the possibility of small airway parameters in transgender female-to-male patients. Consideration of biological sex in selection of the proper endotracheal tube may prevent serious postintubation complications.

**Author’s Note**
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