

RAPID COMMUNICATION

Assessing the concern for airway complications introduced by Wendler's glottoplasty

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Abstract

Objective: Wendler's glottoplasty (WG) is a pitch-elevating surgery performed by laryngologists providing gender-affirming care. The surgery creates an anterior glottic web that could theoretically cause airway concerns, either perioperatively or at the time of future procedures; such concerns are not well-described in the literature. We seek to assess surgeon opinions on airway concerns regarding WG.

Method: A survey of laryngologists assessing opinions on airway considerations in glottoplasty.

Results: A total of 19 physicians responded, representing approximately 193 surgeries. 52.6% performed glottoplasty and the remainder responded based on experience with anterior glottic webs. Two perioperative airway complications were reported, both mild stridor that did not prevent same-day discharge. No long-term sequela was reported. All surveyed laryngologists endorsed an altered general anesthetic approach for future procedures, with 73.7% advocating for use of a smaller endotracheal tube. 72.2% did not have "major concerns" about *future* intubations, and only 5.3% thought the *immediate* risk of airway compromise was a "real concern." 91.9% counsel their patients routinely but briefly on airway concerns. Open-ended comments conveyed themes of concern for post-operative disruption of the web more than of airway compromise.

Conclusion: Because glottoplasty is performed in the anterior glottis and does not significantly impact airway patency, the risk of serious airway complications appears to be minimal. Laryngologists believe future intubations require a modified approach with a smaller tube, partly due to concern for glottic web trauma. Based on this pilot study, the topic deserves greater work to standardize care and anesthetic alterations for patients with WG.

Level of Evidence: 5

KEYWORDS

anterior glottic web, glottoplasty, transgender, vocal therapy, Wendler's glottoplasty

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1 | INTRODUCTION

The incidence of gender-affirming care and gender affirmation has seen a sharp increase in the past decade.^{1,2} Because the voice is a critical component of one's identity, and vocal pitch is one of the most basic sex-specific characteristics of the voice,³ many transgender individuals seek gender-affirming voice modification and/or surgery. James et al. found that of 27,000 transgender women surveyed, 62% of respondents either underwent vocal feminization surgery or expressed intention to in the future.⁴ Wendler's glottoplasty (WG) is an endoscopic technique that shortens the vocal folds to increase vocal pitch. In this procedure, the anterior third to half of the vocal folds are de-epithelialized and then joined together via suture, adhesive, or both (Figure 1).⁵ The advantage of this technique over other voice feminization procedures is that it is safe, minimally invasive, and the resultant change in pitch is the highest and most stable over time.^{6,7}

Little data exists on the incidence and features of post-operative airway complications due to vocal feminization surgery. This pilot study electronically mailed an online REDCap survey to physician members of the American Broncho-Esophagological Association to gain a better understanding of both immediate and delayed airway complications in WG patients and assess surgeon opinions on airway concerns regarding WG. The survey was anonymous, six pages in length, and took approximately 15 minutes to complete. It contained 30 items that asked respondents about their past surgical history, perioperative complications, long-term complications, opinions regarding glottoplasty risks, and breadth of patient consultation.

2 | DISCUSSION

Nineteen physicians responded, representing approximately 193 surgeries. While not constituting complication incidence, responses show surveyed surgeons have experience with the topic in question; 52.6% performed WG and the remainder responded based on their experience with anterior glottic webs. Two perioperative complications

were reported, both mild stridor that did not prevent same-day discharge and were treated with steroids. No long-term sequela was reported.

The immediate risk of airway compromise in patients with WG was thought to be either very unlikely (21.1%), unlikely (31.6%), possible but not common (42.1%), or a real concern (5.3%). Most surgeons think the long-term risk of airway compromise in glottoplasty patients is very unlikely (36.8%) or unlikely (26.3%), while some believe it is possible but not common (36.8%).

As seen in Table 1, 100% of surveyed laryngologists endorsed an altered general anesthetic approach for future procedures, with 73.7% advocating for the use of an endotracheal tube one size down from the appropriate size corresponding to the patient's height and gender assigned at birth. Thirty-two percent of surgeons felt the anesthesiologist should alter their typical approach in some other way, with 15.8% recommending the use of the smallest endotracheal tube available and 10.5% advocating for the use of a laryngeal mask airway to avoid intubation.

Prior studies have identified complication rates to be low and largely limited to granuloma and suture dehiscence from non-compliance with vocal rest and smoking.^{5,8-11} As surgery is limited to the anterior portion of the vocal folds, and airway patency is determined by the configuration of the posterior glottis, the procedure itself is unlikely to result in immediate airway complications. This may be the reason there was largely no concern among surgeons for immediate airway compromise in WG patients.

In one case report, Vowels et al. encountered an unexpected difficult airway during the intubation of a 51-year-old transgender woman status-post facial feminization and vocal cord tightening, which was undisclosed to the authors pre-operatively.¹² This case exemplifies the need of WG patients to disclose their glottoplasty history to future providers so that anesthesiologists may intubate accordingly. 89.5% of responding physicians think patients should alert future providers that they have received WG; 83.3% actually counsel patients to do so.

76.5% of surgeons pre-operatively counsel their patients about a risk of airway compromise from vocal fold shortening,

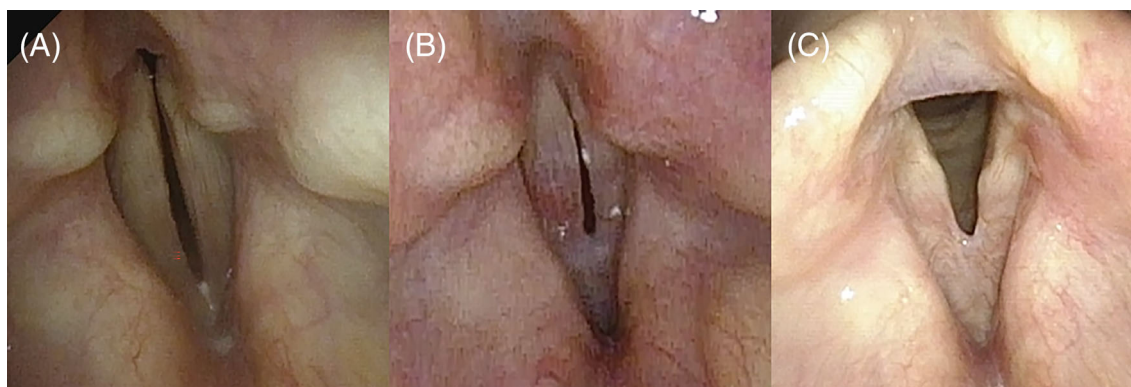


FIGURE 1 (A) Preoperative vocal folds; (B) Adducted vocal folds 12 weeks post-glottoplasty; and (C) Abducted vocal folds 14 weeks post-glottoplasty.

TABLE 1 Key findings.

Survey prompt	Answer	Percentage (%)
Have you performed Wendler's glottoplasty or other pitch-elevating surgeries that shorten the length of the vocal folds?	<input type="radio"/> Yes	52.6
	<input type="radio"/> No	47.4
Approximately how many Wendler's glottoplasty procedures have you performed over your career?	<input type="radio"/> 1-5	40
	<input type="radio"/> 6-20	30
	<input type="radio"/> 21-75	10
	<input type="radio"/> 76+	20
Have you encountered any perioperative airway complications related to Wendler's glottoplasty or a minor variation of this technique?	<input type="radio"/> Yes	10.5
	<input type="radio"/> No	89.5
Please estimate the number of perioperative airway complications related to Wendler's glottoplasty that you have encountered over your career.	1. "1"	
	2. "1"	
Please describe the specific nature of the perioperative airway complication(s) you have encountered.	1. "Stridor."	
	2. "Mild post-op stridor in recovery room."	
Please describe how the perioperative airway complication(s) were managed.	1. "Steroids, observation, voice therapy."	
	2. "Steroids. Discharged same day surgery."	
Have you encountered any complication related to airway compromise in a patient with a remote history of Wendler's glottoplasty?	<input type="radio"/> Yes	0
	<input type="radio"/> No	100
Do you think the immediate risk of airway compromise in patients with Wendler's glottoplasty is:	<input type="radio"/> Very unlikely	21.1
	<input type="radio"/> Unlikely	31.6
	<input type="radio"/> Possible, but not common	42.1
	<input type="radio"/> A real concern	5.3
Do you think the long-term risk of airway compromise in patients with Wendler's glottoplasty is:	<input type="radio"/> Very unlikely	36.8
	<input type="radio"/> Unlikely	26.3
	<input type="radio"/> Possible, but not common	36.8
	<input type="radio"/> A real concern	0
Do you counsel patients pre-operatively about a risk of airway compromise from vocal fold shortening?	<input type="radio"/> Yes	76.5
	<input type="radio"/> No	23.5
Do you counsel patients to alert future providers that they have received Wendler's glottoplasty?	<input type="radio"/> Yes	83.3
	<input type="radio"/> No	16.7
Do you think patients who receive Wendler's glottoplasty are more liable to airway complications during future procedures?	<input type="radio"/> Yes	33.3
	<input type="radio"/> No	66.7
Do you think patients should alert future providers that they have received Wendler's glottoplasty?	<input type="radio"/> Yes	89.5
	<input type="radio"/> No	10.5
<i>Imagine an anesthesiologist calls you to discuss a patient who received Wendler's glottoplasty 5 years ago and now requires hernia repair under general anesthesia.</i>		
What would you recommend? (check all that apply)		
1. I'd recommend a standard intubation approach with an ETT size appropriate for the patient's height and gender assigned at birth.		0
2. I'd recommend a standard intubation approach with an ETT 1 size down from the appropriate size corresponding to the patient's height and gender assigned at birth.		73.7
3. I'd advise the anesthesiologist to alter their typical intubation approach in some other way.		31.6

and 33.3% believe patients who receive WG are more liable to airway complications during future procedures. 15.5% keep these patients in the hospital overnight because of the risk of a compromised airway. 57.9% advise patients to contact their ENT provider

if they are to undergo general anesthesia in the future. Open-ended survey comments conveyed themes of concern for post-operative disruption of the glottic web more than of airway compromise.

A potential limitation of this pilot study is that surgeons with experience in treating WG complications would have been more likely to respond to and complete the survey. Additionally, question order bias may have influenced responses.

3 | CONCLUSION

Because glottoplasty is performed in the anterior glottis and does not significantly impact airway patency, the risk of serious airway complications appears to be minimal. Laryngologists believe future intubations require a modified approach with a smaller endotracheal tube, partly due to concern for glottic web trauma. Based on this pilot study, the topic deserves greater work to standardize care and anesthetic alterations for patients with WG.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

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