

Effect of Unilateral Cordotomy on Perception of Dysphagia

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Introduction

- Transverse CO2 Laser Cordotomy is one of the most common treatments for bilateral vocal fold immobility.
- Bilateral vocal fold immobility most commonly presents with dyspnea and airway restriction, which can be life-threatening.
- While it is known that cordotomy impairs voice quality¹⁰, it is widely believed that cordotomy has the potential to cause swallowing dysfunction by creating glottal incompetence, placing patients at risk for aspiration events.

Hypothesis

Patient perception of swallowing would not change.

Purpose

Evaluate effect of unilateral cordotomy on the perception of dysphagia to better understand the influence of glottic function and its role in dysphagia

Materials and methods

- Retrospective review
- 15 patients across 20 surgeries were included.
 - Inclusion Criteria:
 - Diagnosis of bilateral vocal fold immobility treated with unilateral CO2 laser cordotomy
 - Complete pre- and post-operative EAT-10 questionnaires
- Patients provided EAT-10 questionnaires at their initial visit and all follow-up visits
 - EAT-10 scores were summed and recorded for analysis
- Primary Outcome of Interest: Post-operative change in EAT-10 score

Results

- Of the 20 surgeries, 10 were primary unilateral cordotomies and 10 were revision cordotomies.
- Post-operative EAT-10 changes:
 - Increase in EAT-10 score for 9 procedures
 - Decrease in EAT-10 score for 6 procedures
 - No change in EAT-10 score for 5 procedures

- Pre- and Post-Operative EAT-10 scores:

	Primary Only	Revision Only	Primary and Revision
Median EAT-10 Pre-operatively	4.5 Range = 0-18, IQR = 0-12.75	2.5 Range = 0-15, IQR = 1-9.5	3.5 Range = 0-18, IQR = 0-10.75
Median EAT-10 Post-operatively	1 Range 0-15, IQR 0-11.25	2.5 Range = 0-17, IQR = 0-9.25	2 Range = 0-17, IQR 0-9.75
Median difference in EAT-10 scores	0 p = 0.73	0 p = 0.75	0 P = 0.91

- To better understand the components of the EAT-10 that may have contributed to variability in patient perception of dysphagia, we examined individual EAT-10 items (Figure 1)
 - No clear trend based on individual findings

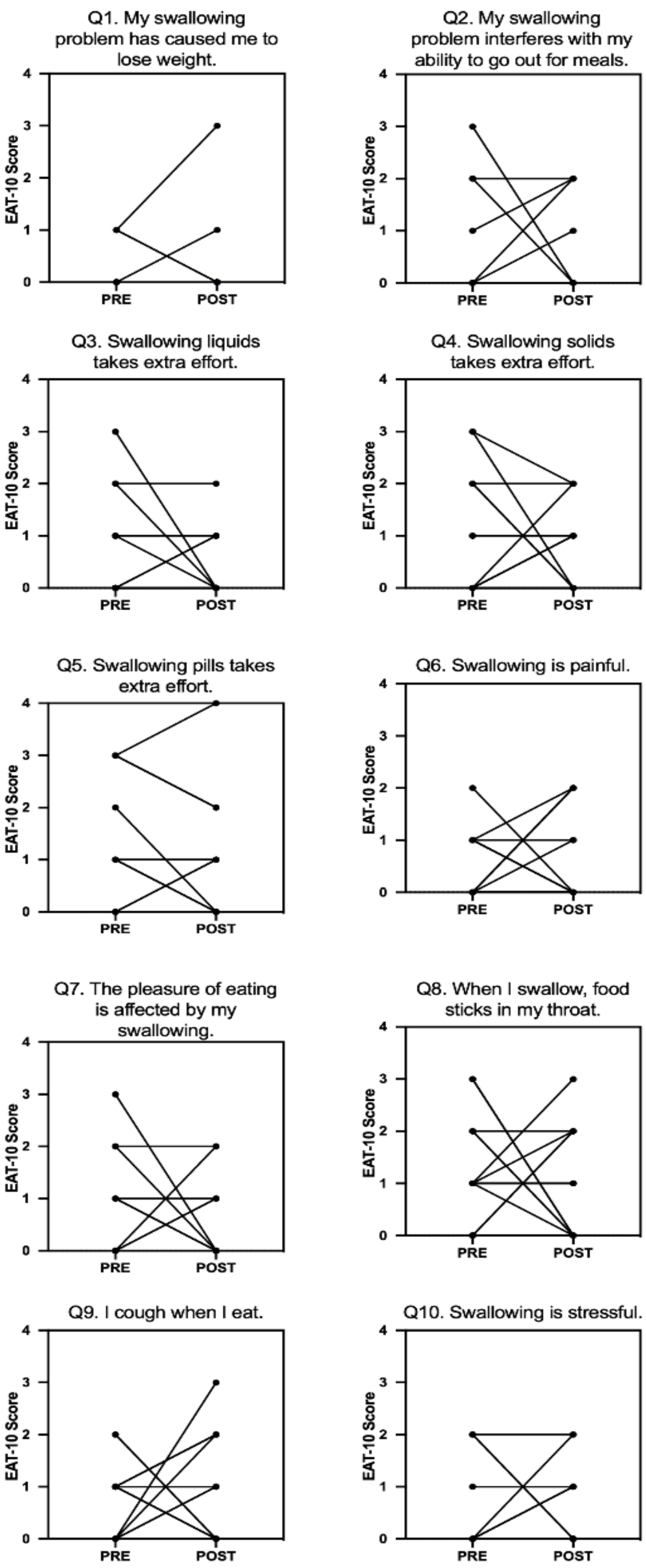


Figure 1. Individual responses (0-4) to specific questions on the EAT-10 demonstrating variability across patients.

Conclusions

- In this study, there was no change in patient perception of dysphagia following unilateral cordotomy for bilateral vocal fold immobility.
- This suggests that unlike vocal impairment, swallowing impairment is not a major consequence of unilateral cordotomy despite reduced glottal competence.
- Glottal closure is only one of many mechanisms employed by the larynx during swallowing and it's likely that additional mechanisms of protection compensate for the glottic insufficiency created by unilateral cordotomy^{16,17}.
- Unilateral cordotomy is safe, effective, and reliable treatment for bilateral vocal fold immobility.

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Literature cited

Belafsky, P., Mouadeb, D., Rees, C., Pryor, J., Postma, G., Allen, J. and Leonard, R., 2008. Validity and Reliability of the Eating Assessment Tool (EAT-10). *Annals of Otology, Rhinology & Laryngology*, 117(12), pp.919-924.

Conklin, M., Clary, M., Cuadrado, E. and Jetté, M., 2019. Effect of Unilateral Cordotomy on Perception of Dysphagia. *Annals of Otology, Rhinology & Laryngology*, 129(6), pp.536-541.

Fujinaki, Y., Tanoda, K., Kobayashi, R., Tonghys, C., Tanaka, F., Kuroda, H., Numata, T., Ishi, T., Kuroda, R., Masuda, S., Hashimoto, S., Matsuoka, H., Shindo, N., Mori, T., Mori, H., Uchiyama, N., Kamel, Y., Tanaka, M., Homma, H., Funatsu, S., Usui, S., No, I., Homma, K., Shindo, A., Takumaru, Y., Morita, Y., Ueha, S., Nito, T., Kikuta, S., Sakimoto, S., Kanda, K., Sakamoto, T., Itoh, K., Yamashita, T. and Matsumoto, S., 2016. Independent exercise for glottal incompetence to improve vocal problems and prevent aspiration pneumonia in the elderly: a randomized controlled trial. *Clinical Rehabilitation*, 31(8), pp.1049-1055.

Shaker, R., Dodds, W., Dantas, R., Hogan, W. and Arndorfer, R., 1990. Coordination of deglutitive glottic closure with oropharyngeal swallowing. *Gastroenterology*, 98(6), pp.1478-1484.

Yoss, A. and Humbert, I., 2018. "Hidden in Plain Sight": A Descriptive Review of Laryngeal Vestibule Closure. *Dysphagia*, 34(3), pp.281-289.

Further information

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