

Open, Direct Midline Glossectomy

Dustin Platter, BS; Joseph Boone, BS; Michael Abidin, MD
Metropolitan ENT and Facial Plastic Surgery, Alexandria, VA

Abstract/Hypothesis

The open, direct midline glossectomy represents a more reliable, efficient, safe, cost-effective, and easily learned method for reducing the size of the tongue as part of multilevel surgery for obstructive sleep apnea-hypopnea syndrome compared to the same procedure performed by TORS.

Technique

The patient is taken to the operating room and general anesthesia is administered via nasotracheal intubation. The patient's tongue is inspected and is injected with 1/2% marcaine with 1:200,000 epinephrine on the posterior 1/3 of the tongue. After allowing a few minutes for vasoconstriction, a medium sized bite guard is placed opposite the surgical hand of the surgeon. A #1 vicryl suture is placed through the tip of the tongue and used for retraction. Inspection of the tongue will reveal an approximate amount of tissue that needs to be resected. Using a Bovie pencil set on 30, a lenticular shaped portion of the posterior 1/3rd of the tongue is resected: care is taken to avoid the lateral portion of the base of the tongue in order to avoid the neurovascular tissue. Special care is taken with posterior border of the resection in order to prevent bleeding from the free edge of the excision. A suction cautery device is used to control any bleeding on the raw surface of the tongue. The anterior 2/3 of the tongue is closed with a 1-0 chromic suture with a UR6 needle in a horizontal mattress fashion. A second row of single sutures is placed overlapping the horizontal mattress sutures. The oropharynx is irrigated. The bite block is removed. The tongue retaining suture is cut from the tongue. The patient is returned to anesthesia.



Figure 1. Tongue at baseline



Figure 2. Central portion of tongue base being dissected.



Figure 3. Tongue tissue nearly out



Figure 4. Horizontal mattress suture placement

Discussion

The days of Uvulopalatopharyngoplasty (UP3) as a sole primary modality for the treatment of sleep apnea are in the past¹. The concurrent approach to obstructive sleep apnea involves multilevel surgery and has included various techniques for treating sleep apnea. In fact, the glossectomy as part of multilevel surgery has been shown to be effective. The suggestion is that the stand alone glossectomy has a favorable evidence. There is currently insufficient evidence to evaluate it as a stand alone procedure².

There are different techniques to reduce the size of the tongue and the base of tongue. Included is submucosal linguloplasty with positive data reducing the apnea hypopnea index from 44.0 ± 4.3 to 12.5 ± 2.3 . This study included the submucosal lingualplasty with concurrent palatal surgery³.

Radiofrequency ablation of the tongue has been utilized as a positive modality in a recent meta analysis with a long term reduction in RDI levels of 45% at long term⁴.

Coblation-assisted Lewis and MacKay operation has been reported in the literature. Whereas this operation purports to retain the contours and mucosa of the tongue, the current authors of this paper are concerned about the proximal dissection to the neurovascular bundle and would question whether or not this would be a successful widely utilized procedure⁵.

The submucosal lingualplasty, radiofrequency ablation, and coblated assisted Lewis and MacKay operation all do not allow for direct visualization of the surgical field^{1,2,3}.

Transoral robotic glossectomy represents a new modality for the treatment of obstructive sleep apnea-hypopnea syndrome. There has been question in the literature regarding the need for both routine tracheostomy and/or prolonged intubation associated with procedure. Also, increased cost associated with the robot in other surgeries has been reported⁶. In regards to duration, there is additional time required to initiate, set up, and calibrate the robotic device before, during and after the procedure. Lastly, specialized assistance is required for the procedure as well as extensive training to be performed on the part of the surgeon⁷.

Conclusion

The open, direct midline glossectomy is a much simplified procedure for reducing the size of the tongue. The surgeon can tailor each procedure directly while visualizing the amount of tissue that is removed. This affords the surgeon a more reliable way to avoid the neurovascular bundles and provides a very exacting amount of tissue removal. The mechanics of performing this type of procedure and well understood and practiced by all otolaryngologist familiar with tonsillectomy. No patients have required intubation or more than a single overnight stay in the hospital. The senior author has been performing this procedure for approximately 20 years and with close cooperation of his anesthesiologist has been able to converse with the awake patient in the postoperative recovery area within 1 hour of starting the procedure.

The open, direct midline glossectomy represents a reliable, efficient, safe, cost-effective, and easily learned method for reducing the size of the tongue as part of multilevel surgery for obstructive sleep apnea-hypopnea syndrome

Contact

Dustin Platter
Metropolitan ENT and Facial Plastic Surgery
Email: dustin.platter1@gmail.com
Website: metropolitanent.com
Phone: (703) 313 - 7700

References

1. Sundaram, S., Bridgman, S.A., Lim, J., Lasserson, T.J. 2005. Surgery for obstructive sleep apnoea. *Cochrane Database Syst Rev.* [2005 Oct 19; 2015 Sep 15];(4):CD001004.
2. Murphy, A.W., Kandl, J.A., Nguyen, S.A., Weber, A.C., Gillespie, M.B. 2015. The effect of glossectomy for obstructive sleep apnea: a systematic review and meta-analysis. *Otolaryngology Head Neck Surg.* 153(3): 334-42. doi: 10.1177/0194599815594347. Epub 2015 Jul 16.
3. Gunawardena, I., Robinson, S., Mackay, S., Woods, C.M., Choo, J., Easterman, A., Carney, A.S. 2013. Submucosal lingualplasty for adult obstructive sleep apnea. *Otolaryngology Head Neck Surg.* 148(1): 157-65. doi: 10.1177/0194599812461750. Epub 2012 Sep 26.
4. Farrar, J., Ryan, J., Oliver, E., Gillespie M.B. 2008. Radiofrequency ablation for the treatment of obstructive sleep apnea: a meta-analysis. *Otolaryngology Head Neck Surg.* 118(1): 1878-83. doi: 10.1097/MLG.0b013e31817d9cc1.
5. Mackay, S.G., Jefferson, N., Grundy, L., Lewis, R. 2013. Coblation-assisted Lewis and MacKay operation (CobLAMO): new technique for tongue reduction in sleep apnoea surgery. *Journal of Laryngology & Otology.* 127(12):1222-5. doi: 10.1017/S0022215113002971. Epub 2013 Nov 19.
6. Ahmed, K., Ibrahim, A., Wang, T.T., Khan, N., Challacombe, B., Khan, M.S., Dasgupta, P. 2012. Assessing the cost effectiveness of robotics in urological surgery - systematic review. *BJU Int.* 110(10):1544-56. doi: 10.1111/j.1464-410X.2012.11015.x. Epub 2012 Mar 22.
7. Friedman, M., Hamilton, C., Samuelson, C.G., Kelley, K., Taylor, D., Pearson-Chauhan, K., Maley, A., Taylor, R., Venkatesan, T.K. 2012. Transoral robotic glossectomy for the treatment of obstructive sleep apnea-hypopnea syndrome. *Otolaryngology Head Neck Surg.* 146(5):854-62. doi: 10.1177/0194599811434262. Epub 2012 Jan 13.