Evidence-based medicine measures for neural monitoring in thyroid surgery

Guido Nicola Zanghì[1], Hui Sun[2], Gianlorenzo Dionigi[3]

[1]Department of Surgery, Policlinico Vittorio Emanuele University Hospital, General Surgery and Oncology Unit, University of Catania, Catania, Italy; [2]Division of Thyroid Surgery, Jilin Provincial Key Laboratory of Surgical Translational Medicine, China-Japan Union Hospital of Jilin University, Changchun 130033, China; [3]Division for Endocrine and Minimally Invasive Surgery, Department of Human Pathology in Adulthood and Childhood "G. Barresi", University Hospital G. Martino, University of Messina, Messina, Italy

Correspondence to: Prof. Gianlorenzo Dionigi. Division for Endocrine and Minimally Invasive Surgery, Department of Human Pathology in Adulthood and Childhood "G. Barresi", University Hospital G. Martino, University of Messina, Via C. Valeria 1, 98125 Messina, Italy. Email: gdionigi@unime.it.

Intraoperative neural monitoring (IONM) in thyroid and parathyroid surgery is not based on class I evidence. IONM in thyroid surgery is currently limited to class II and III studies (1-7).

Actually, none IONM technique applied in any field of general surgery [as in neurosurgery, orthopedics, spinal surgery, ear, nose, throat (ENT), facial nerve, vascular] acquire class I evidence (1).

Furthermore, IONM should be equalized at same level of significance of any other technology applied to most our clinical practice within thyroid and parathyroid surgery as for the use of energy based devices, endoscopy, robotic, intact parathyroid hormone (iPTH) measurement, thermal ablation, screening (1-7).

Wherefore, the level of evidence is not defective than that found mostly for any technology proposed and applied in thyroid surgery (8,9).

For IONM to be valuable (I) must furnish instantly information of impending recurrent laryngeal nerve (RLN) damage early enough to permit the thyroid surgeon to take conveniently measures to inverse or underrate the harm (II) simply to adapt, perform and read, (III) accessible resource (IV) cost-effective (1-7).

Practically, evidence-based measures for IONM in thyroid surgery protocol studies hardly can incorporate surgeon clinical emprise (i.e., optimization of nerve dissection) and intraoperative decision making (i.e., avoidance of bilateral RLN injury), patient expense for RLN injury, and pathophysiologic rationale (i.e., research).

Unlikely class I protocol studies will ever occur again after the one by Barczyński *et al.* (8,9). The likelihood of preventing RLN injury using IONM and the incidence of permanent RLN complications is very low (8,9). One randomized study evaluated prospectively IONM in thyroid surgery. The prevalence of transient RLN paresis was lower in patients who had RLN monitoring by 2.9 percent in high-risk patients (P=0.011) and 0.9 percent in low-risk patients (P=0.249) (8,9).

Acknowledgments

Footnote

Provenance and Peer Review: This article was a standard submission to the journal. The article has undergone external peer review.

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at http://dx.doi.org/10.21037/aot.2018.03.03). Gianlorenzo Dionigi serves as an unpaid editorial board member of *Annals of Thyroid* from Mar. 2017 to Feb. 2019. Hui Sun serves as an unpaid editorial board member of *Annals of Thyroid* from May 2017 to Apr. 2019. The other author has no conflicts of interest

to declare.

Ethical Statement: The authors are accountable for all aspects of the manuscript and ensure that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Open Access Statement: This is an Open Access article distributed in accordance with the Creative Commons Attribution-NonCommercial-NoDerivs 4.0 International License (CC BY-NC-ND 4.0), which permits the non-commercial replication and distribution of the article with the strict proviso that no changes or edits are made and the original work is properly cited (including links to both the formal publication through the relevant DOI and the license). See: https://creativecommons.org/licenses/by-nc-nd/4.0/.

References

1. Potenza AS, Araujo Filho VJ, Cernea CR. Injury of the external branch of the superior laryngeal nerve in thyroid surgery. Gland Surg 2017;6:552-62.
2. Schneider R, Machens A, Randolph GW, et al. Opportunities and challenges of intermittent and continuous intraoperative neural monitoring in thyroid surgery. Gland Surg 2017;6:537-45.
3. Christoforides C, Papandrikos I, Polyzois G, et al. Two-stage thyroidectomy in the era of intraoperative neuromonitoring. Gland Surg 2017;6:453-63.
4. Schneider R, Randolph GW, Barczynski M, et al. Continuous intraoperative neural monitoring of the recurrent nerves in thyroid surgery: a quantum leap in technology. Gland Surg 2016;5:607-16.
5. Wojtczak B, Barczyński M. Intermittent neural monitoring of the recurrent laryngeal nerve in surgery for recurrent goiter. Gland Surg 2016;5:481-9.
6. Wu CW, Randolph GW, Lu IC, et al. Intraoperative neural monitoring in thyroid surgery: lessons learned from animal studies. Gland Surg 2016;5:473-80.
7. Deniwar A, Kandil E, Randolph G. Electrophysiological neural monitoring of the laryngeal nerves in thyroid surgery: review of the current literature. Gland Surg 2015;4:368-75.
8. Dralle H, Sekulla C, Lorenz K, et al. Intraoperative monitoring of the recurrent laryngeal nerve in thyroid surgery. World J Surg 2008;32:1358-66.
9. Barczyński M, Konturek A, Cichoń S. Randomized clinical trial of visualization versus neuromonitoring of recurrent laryngeal nerves during thyroidectomy. Br J Surg 2009;96:240-6.