Commentary

More is better when it comes to surgeon experience and patient outcome in thyroid surgery

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Total thyroidectomy is the most commonly performed endocrine surgical procedure worldwide, both for thyroid cancer and for benign thyroid disease (1). However, potential morbidity of this operation including postoperative hypoparathyroidism, recurrent laryngeal nerve and external branch of the superior laryngeal nerve injury may substantially limit patient quality of life afterwards. It has been repeatedly shown in the literature that surgical volume correlates with decreased prevalence of postoperative complications and shorter hospital stay in thyroid surgery (1-3). Al-Quarayshi *et al*. performed cross-sectional analysis of adult (≥18 years) inpatients in US community hospitals using the Nationwide Inpatient Sample for the years 2003 through 2009. A total of 77,863 patients were included. Surgeon volumes were stratified into low (1–3 thyroidectomies per year), intermediate (4–29 thyroidectomies per year), and high (≥30 thyroidectomies per year). Procedures performed by low-volume surgeons were associated with a higher risk of postoperative complications compared with high-volume surgeons [15.8% *vs*. 7.7%; OR, 1.55 (95% CI, 1.19–2.03); P=0.001]. Mean (SD) hospital cost was significantly associated with surgeon volume [high volume, $6,662.69 ($409.31); intermediate volume, $6,912.41 ($137.20); low volume, $10,396.21 ($345.17); P<0.001]. During the study period, if all operations performed by low-volume surgeons had been selectively referred to intermediate- or high-volume surgeons, savings of 11.2% or 12.2%, respectively, would have been incurred. On the basis of the cost growth rate, greater savings are forecasted for high-volume surgeons. With a conservative assumption of 150,000 thyroidectomies per year in the United States, referral of all patients to intermediate- or high-volume surgeons would produce savings of $2.08 or $3.11 billion, respectively, over a span of 14 years (2).

However, the definition of a high-volume thyroid surgeon has remained unclear. Minimum case volume threshold has not been incorporated so far by general surgical professional societies into the credentialing process of surgeons undertaking thyroid surgery. On the other hand, three large academic institutions in US—Dartmouth, the University of Michigan, and Johns Hopkins University—asked their surgeons to take a "Volume Pledge", meaning that surgeons who do not perform a minimum volume of a specific procedure should stop doing those operations (personal communication). Hence, determination if there is a minimum number of total thyroidectomies per surgeon per year that is associated, on average, with superior outcomes is of utmost importance for surgeons, referring physicians, and patients. To clarify this issue, Adam at al. analyzed in their study 16,954 patients undergoing total thyroidectomy (47% had thyroid cancer and 53% benign disease) who were identified from the Health Care Utilization Project-National Inpatient Sample [1998–2009] using multivariate logistic regression with restricted cubic splines to examine the association between the number of annual total thyroidectomies per surgeon and risk of complications. Outcomes of this study may appear surprising to many, as median annual surgeon volume was 7

cases and 51% of surgeons performed only 1 case per year. Overall, 6% of the patients experienced complications. After adjustment, the likelihood of experiencing a complication decreased with increasing surgeon volume up to 26 cases/y (P<0.01). Among all patients, 81% had surgery by low-volume surgeons (≤25 cases/y). With adjustment, patients undergoing surgery by low-volume surgeons were more likely to experience complications (odds ratio 1.51, P=0.002) and longer hospital stays (+12%, P=0.006). Patients had an 87% increase in the odds of having a complication if the surgeon performed 1 case per year, 68% for 2 to 5 cases per year, 42% for 6 to 10 cases per year, 22% for 11 to 15 cases per year, 10% for 16 to 20 cases per year, and 3% for 21 to 25 cases per year (3). These data clearly show that identifying a threshold number of cases defining a high-volume thyroid surgeon is important, as it has implications for quality improvement, criteria for referral and reimbursement, and surgical education (3).

Thus, from robust population level data such as these, it can be concluded that referral of patients to high-volume thyroid surgeons is associated, on average, with superior outcomes. However, such referral is not always possible, given the relative scarcity of high-volume thyroid surgeons and their geographic distribution (4). Therefore, conclusions at a population level cannot always be applied to individual surgeons and patient circumstances (4). It may, however, be reasonable to consider sending patients with more challenging benign thyroid disease (e.g., substernal goiter, Grave's disease, or recurrent goiter) or with more advanced thyroid cancer to a high volume thyroid surgeon with known expertise in the management of complex thyroid patients. As shown by outcomes of most recent international survey, many aspects of recurrent laryngeal nerve, and external branch of the superior laryngeal nerve intraoperative management and monitoring, and laryngeal examination during thyroidectomy differ between surgeons of varying volume, age, and training background (5). Utilization of intraoperative neural monitoring to identify the nerve and test its function intraoperatively is dependent on individual surgical preferences. High-volume surgeons, those with an otolaryngology background, and those at a younger age are more aware of the potential benefits of this modern technique for better voice preservation. Routine use of neural monitoring for the external branch of the superior laryngeal nerve is less common than for the recurrent laryngeal nerve. Use of intraoperative neural monitoring and laryngeal examination appears to be linked. Intraoperative neural monitoring data are used by many to stage thyroid surgery in benign rather than malignant disease. Use of laryngeal examination is also more common in higher-volume surgeons (5). In general, high-volume thyroid surgeons are more focused on improving safety of the operation according to the existing evidence-based management guidelines.

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Footnote

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References

1. Barczyński M, Konturek A, Stopa M, et al. Total thyroidectomy for benign thyroid disease: is it really worthwhile? Ann Surg 2011;254:724-29; discussion 729-30.
2. Al-Qurayshi Z, Robins R, Hauch A, et al. Association of Surgeon Volume With Outcomes and Cost Savings Following Thyroidectomy: A National Forecast. JAMA

Otolaryngol Head Neck Surg 2016;142:32-9.
3. Adam MA, Thomas S, Youngwirth L, et al. Is There a Minimum Number of Thyroidectomies a Surgeon Should Perform to Optimize Patient Outcomes? Ann Surg 2016. [Epub ahead of print].
4. Haugen BR, Alexander EK, Bible KC, et al. 2015 American Thyroid Association Management Guidelines for Adult Patients with Thyroid Nodules and Differentiated Thyroid Cancer: The American Thyroid Association Guidelines Task Force on Thyroid Nodules and Differentiated Thyroid Cancer. Thyroid 2016;26:1-133.
5. Barczyński M, Randolph GW, Cernea C, et al. International survey on the identification and neural monitoring of the EBSLN during thyroidectomy. Laryngoscope 2016;126:285-91.

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