



# Frozen section of central lymph nodes in thyroid cancer

Ashok R. Shaha<sup>1</sup>, R. Michael Tuttle<sup>2</sup>

<sup>1</sup>Head and Neck Service, Memorial Sloan Kettering Cancer Center, New York, NY, USA; <sup>2</sup>Division of Endocrinology, Memorial Sloan Kettering Cancer Center, New York, NY, USA

Correspondence to: Ashok R. Shaha, MD, FACS. Memorial Sloan Kettering Cancer Center, 1275 York Avenue, New York, NY 10065, USA.

Email: shahaa@mskcc.org.

Comment on: Kim MJ, Kim HJ, Park CS, *et al.* Frozen section analysis of central lymph nodes in papillary thyroid cancer: the significance in determining the extent of surgery. *Gland Surg* 2022;11:640-50.

Submitted Apr 06, 2022. Accepted for publication Apr 17, 2022.

doi: 10.21037/gs-22-231

View this article at: <https://dx.doi.org/10.21037/gs-22-231>

In this issue of *Gland Surgery*, Kim *et al.* from South Korea report their experience with frozen section analysis of central compartment nodes in papillary thyroid cancer (1). They have used frozen section analysis to aid in intraoperative decision making with regard to the extent of thyroidectomy, including immediate completion thyroidectomy in select patients with multiple positive nodes in the central compartment. The American Thyroid Association (ATA) guidelines use 5 lymph nodes with metastatic focus less than 2 mm as the cut-off for truly low-risk thyroid cancer and completion thyroidectomy in these patients is not advocated (2). The authors have also applied 5 lymph nodes as the cut-off; however, they have increased metastatic focus to 5 mm in the largest dimension, which is very reasonable. Their average time for frozen section is approximately 30 minutes, and the level of detail provided by their pathologists—e.g., the number of lymph nodes retrieved, the number of positive nodes, and the dimensions of the metastatic focus in the frozen section—is remarkable. This level of detail with regard to the status of cervical lymph nodes, if available, has the potential to significantly improve intraoperative decision making. Although the information in this manuscript is definitely interesting, obtaining such detailed analysis on frozen section may not be easy in other institutions.

The authors' retrospective study included 290 patients with unilateral clinically node-negative papillary thyroid cancer who underwent surgery with frozen analysis of the ipsilateral central compartment nodes from 2020 to 2021. They have routinely performed elective central compartment dissection. High-risk patients with primary

tumors, gross extrathyroidal extension, or contralateral suspicious nodules were excluded. Following intra-operative frozen section analysis, completion thyroidectomy was indicated in 47 patients (16.2%) at the same time of initial surgery. Larger tumor size and male sex were noted as the main contributing factors for completion thyroidectomy. The discrepancy between frozen section and permanent pathology is reported in 79 patients (25%) who tended to be younger. They have also noticed a higher incidence of positive lymph nodes in younger patients, which is well known with the biology of thyroid cancer in young individuals. The conversion from negative to positive lymph nodes in final pathology was reported at 6.3% while 30 patients were noted to have more positive nodes in final pathology report. Among 243 patients who had undergone less than total thyroidectomy, 5 patients (2.1%) had discrepant frozen and permanent analysis. Sensitivity, specificity, positive predictive value, and negative predictive value were reported as 94.6%, 100%, 100%, and 96.1%, respectively. No additional surgery was planned in patients undergoing less than total thyroidectomy. The 5 patients with discrepant frozen and permanent results are being observed. Short-term follow-up revealed no disease recurrence.

This is an interesting manuscript conceptually to analyze central compartment lymph nodes on frozen section and evaluate the extent of the disease, including number of positive nodes, number of nodes retrieved, lymph node ratio (lymph node density), and the size of metastatic focus. When it comes to the central compartment there are a few issues which we would like to expand. Preoperative

evaluation with high-quality ultrasonography of the thyroid, opposite lobe, central compartment, and lateral neck nodes (lymph node mapping) is vitally important in all patients undergoing thyroid surgery. Cross-sectional imaging by CT scan with contrast is also very helpful to evaluate both the central and lateral compartments along with retropharyngeal and parapharyngeal lymph nodes. Even though there is a myth that the use of iodinated contrast can result in an unacceptable delay in radioactive iodine scanning and therapy, it should be noted that the information gained prior to the first surgery is vitally important to undertake optimal surgical treatment and in our view the information obtained with a pre-operative CT of the neck with contrast outweighs a theoretical delay in administration of RAI. The 2015 ATA guidelines endorsed the preoperative cross-sectional imaging by CT scan with contrast in properly selected patients which we agree is very critical for the surgeons to evaluate the primary tumor, central nodes, and lateral nodes (2). The decision about extent of thyroidectomy is multifactorial and should be based on sound oncologic principles, careful pre-operative imaging, and an understanding of patients' values and expectations along with issues of quality of life and complications. The main consideration for total or completion thyroidectomy is to facilitate use of RAI. This decision has become more challenging as the absolute indications for RAI ablation and RAI adjuvant therapy have become more restricted in guidelines over the last several years (2). In our practice, we usually reserve RAI adjuvant therapy for selected patients with tumors likely to be RAI-avid who are at intermediate or high risk of recurrence. In young patients, we try to avoid total thyroidectomy to minimize the need for thyroid hormone therapy and decrease the likelihood of postoperative complications related to temporary or permanent hypoparathyroidism or nerve injury. In our experience, patients undergoing routine total thyroidectomy have higher risk of complications with some having significant alterations in their quality of life.

The debate continues regarding prophylactic central compartment dissection (3). It is instructive that the authors have such a large series of patients with routine central compartment dissection. It is very important to evaluate the central compartment critically at the time of surgery based on gross findings of the bilateral central compartments and paratracheal regions. If there are any suspicious lymph nodes, a frozen section analysis should be undertaken, and if positive, appropriate central compartment clearance should be performed. It should be distinguished between thorough

central compartment evaluation from central compartment dissection. Most of the surgeons can appreciate the clinical findings as suspicious and the frozen section can supplement the decision making. If there are multiple positive nodes, we would definitely consider total thyroidectomy; however, if there are 1 or 2 positive nodes, we are very comfortable with lobectomy alone unless the nodal metastasis is large with gross extranodal extension. The incidence of Hashimoto's thyroiditis especially in the United States is quite high and often these individuals will have enlarged lymph nodes in the paratracheal area and so it would be appropriate to get a frozen section.

Our practice is to get a frozen section on suspicious lymph nodes rather than the entire central compartment dissection as reported by these authors. We do not support the philosophy of routine central compartment dissection in clinically negative lymph nodes, as the risk of complications may be much worse than the disease itself. Furthermore, we do not routinely recommend RAI ablation or adjuvant therapy in patients with clinical N0 necks even if the final pathology report shows small volume lymph node metastases that were not clinically apparent pre-operatively or intra-operatively. However, we will consider RAI in small volume lymph node metastasis if a significant number are involved or if a high percentage of the removed lymph nodes harbor metastatic disease. Thus, in some cases, the meticulous description of the cervical lymph node metastasis from intraoperative frozen section analysis could lead to a recommendation for total thyroidectomy and RAI therapy even in the absence of gross involvement of cervical lymph nodes.

The second aspect of this manuscript is the indications for completion or total thyroidectomy. As mentioned before if there are multiple positive nodes, we will definitely consider total thyroidectomy in an effort to facilitate radioactive iodine and avoid a second surgical procedure at a later date. The other indications are gross extrathyroidal extension, bilateral tumors, large size primary, or aggressive histology. The aggressive histology, such as columnar cell, hobnail variety, major capsular or vascular invasion, can be detected only when the final pathology report is available. In our experience these are the only patients with adverse pathology may be considered for completion thyroidectomy. In this regard, our incidence of completion thyroidectomy is only 5–10%. The authors have done a remarkable job along with their pathology department to evaluate the entire central compartment specimen for number of lymph nodes, number of positive nodes, and dimension of the metastatic

focus. This is quite unique and definitely the pathologists do get credit for their involvement in such analysis; however, this may not be practical in every institution. We are sure the authors have their pathologists actively involved in detailed evaluation and committed to thorough evaluation of the central compartment on frozen section.

The decisions about central compartment have generated considerable debate since the first ATA guidelines published in 2006 (3), which casually mentioned that a central compartment dissection may be considered in patients with tumors more than 1 cm. This generated considerable interest in central compartment along with increased risk of complications related to parathyroid injury and nerve injuries. In the 2009 ATA guidelines, this was restricted to select patients with gross extrathyroidal extension, aggressive histology, or large size primary tumor which is commensurate with general philosophy of management of thyroid cancers (4). The 2015 guidelines confirmed this philosophy of selective central compartment dissection (2).

While the extent of thyroid surgery, neck dissection, and use of RAI continues to generate considerable debate and remains controversial, it is very important that the surgeon and the endocrinologist work together, hand-in-hand and have the same basic philosophy of management of thyroid cancers which they can relay to the patient and the family to avoid any confusion and non-scientific maximalist attitude. It is also very important to offer patients with best quality of life without any compromise in their oncologic outcome. We would like to take this opportunity to congratulate the authors for their interesting study and commend the pathology department for being so detailed in frozen section.

### Acknowledgments

*Funding:* None.

### Footnote

*Provenance and Peer Review:* This article was commissioned by the editorial office, *Gland Surgery*. The article did not undergo external peer review.

*Conflicts of Interest:* Both authors have completed the ICMJE uniform disclosure form (available at <https://gs.amegroups.com/article/view/10.21037/gS-22-231/coif>). ARS serves as an unpaid editorial board member of *Gland Surgery* from

August 2020 to July 2022. The other author has no other conflicts of interest to declare.

*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring 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. Kim MJ, Kim HJ, Park CS, et al. Frozen section analysis of central lymph nodes in papillary thyroid cancer: the significance in determining the extent of surgery. *Gland Surg* 2022;11:640-50.
2. 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.
3. Cooper DS, Doherty GM, Haugen BR, et al. Management guidelines for patients with thyroid nodules and differentiated thyroid cancer. *Thyroid* 2006;16:109-42.
4. American Thyroid Association (ATA) Guidelines Taskforce on Thyroid Nodules and Differentiated Thyroid Cancer, Cooper DS, Doherty GM, et al. Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer. *Thyroid* 2009;19:1167-214. Erratum in: *Thyroid* 2010;20:942. Hauger, Bryan R [corrected to Haugen, Bryan R]. Erratum in: *Thyroid* 2010;20:674-5.

**Cite this article as:** Shaha AR, Tuttle RM. Frozen section of central lymph nodes in thyroid cancer. *Gland Surg* 2022;11(4):637-639. doi: 10.21037/gS-22-231