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New Recommendations for Extent of Thyroidectomy and Active Surveillance for the Treatment of Differentiated Thyroid Cancer

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Thyroid cancer has become increasingly prevalent in clinical practice, having nearly tripled in incidence during the last 4 decades in the United States.¹ This increase is almost entirely attributed to a rise in the diagnosis of papillary thyroid cancer. Papillary thyroid microcarcinomas (PTMCs), which measure 1 cm or less at the largest dimension, constitute almost half of these new diagnoses. Papillary thyroid microcarcinomas typically grow very slowly and are highly unlikely to cause symptoms, much less death. Despite this evidence, the conventional management paradigm of immediate surgical resection, often followed by radioactive iodine (RAI) therapy, has essentially remained unchanged since the 1950s. These issues have recently prompted the American Thyroid Association (ATA) to reexamine treatment options for differentiated thyroid cancer (DTC).²

Active Surveillance vs Thyroidectomy

After surgical resection, the rate of locoregional recurrence of PTMC is reported to be 2% to 6% and disease-specific mortality, less than 1%.³ These excellent outcomes may be related to the indolent nature of these tumors rather than the effectiveness of treatment because similar outcomes have been reported in prospective trials of active surveillance in patients with PTMC.^{4,5} However, thyroidectomy permits removal of the primary tumor, facilitates follow-up, and might decrease the need for further intervention and the inherent anxiety associated with this prospect. Surgical management usually requires hospital admission and carries a 1% to 30% risk for complications that may negate any potential benefit in patients who already have low-risk disease. Also, thyroidectomy does not obviate the need for long-term surveillance for disease recurrence. Managing these low-risk cancers without a clear

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benefit to the patient has therefore resulted in a backlash against the early detection and management of PTMC. This backlash is clearly evident in the 2015 iteration of the ATA guidelines.² To overcome the issue of overdiagnosis and overtreatment, the guidelines recommend against fine-needle aspiration biopsy for any thyroid nodule measuring 1 cm or less, even nodules with suggestive characteristics (but without evidence of extrathyroidal extension or lymphadenopathy suggestive of malignant disease). Moreover, the traditional arbitrary management paradigm of immediate surgical intervention has been revised. The ATA now recommends consideration of active surveillance as an alternative to immediate surgery in patients with very low-risk tumors, such as PTMCs, in the absence of invasion, metastases, and cytologic or molecular evidence of aggressive disease. The major impact of active surveillance is in avoidance of unwarranted surgery, unnecessary morbidity, potential RAI administration, and thyroid hormone replacement therapy. This impact is especially helpful in patients who are high-risk surgical candidates, who are expected to have a relatively short remaining life span, or with concomitant medical issues that need to be addressed before surgery.

In our opinion, a significant challenge of active surveillance lies in the ability to exclude patients who have tumors that are likely to grow, spread to regional lymph nodes, or metastasize to distant sites. All large and aggressive papillary thyroid cancers must have been PTMCs previously. Indeed, active surveillance studies^{4,5} have shown that as many as 16% of patients will develop consequential significant disease requiring intervention. Although clinical and histopathologic risk factors predictive of unfavorable outcomes are well established in larger DTCs, they are not well identified in PTMC. Various studies have elucidated clinical and radiographic features predictive of unfavorable outcome in PTMCs, and these are delineated in the ATA guidelines.² In the presence of high risk for progressive features among patients with PTMCs, active surveillance may not be ideal. Ultimately, the initial management strategy of PTMC should be compatible with the overall treatment strategy and follow-up plan recommended by the multidisciplinary team. Variables for the decision to abandon an active surveillance management protocol and proceed to surgery must also be clearly defined.

In cases where surgery is preferred, the extent of initial thyroidectomy does not appear to influence long-term mortality or recurrence rates. Lobectomy or total thyroidectomy for PTMC was found in general to confer an excellent prognosis independent of the extent of resection.⁶ Although total thyroidectomy can facilitate follow-up of these tumors and decrease the need for further intervention and the inherent anxiety associated with this prospect, patients with low-risk PTMCs who undergo total thyroidectomy do not live longer than those who undergo lobectomy. Also, total thyroidectomy, even in the hands of high-volume surgeons, carries a significantly greater risk for complications than lobectomy. Consequently, the 2015 ATA guidelines state that when surgical resection is chosen in cases of unifocal, intra-thyroidal PTMC with favorable ultrasonographic characteristics and no clinically detectable lymph node metastases, family history of thyroid cancer, or prior head and neck radiotherapy, lobectomy alone is sufficient.² Completion thyroidectomy is not required unless locoregional recurrence is subsequently detected.

Extent of Thyroidectomy in Patients With DTC of 4 cm or Less

Total thyroidectomy has been considered the primary initial surgical treatment option for nearly all DTCs larger than 1 cm. However, because recent data have supported limited thyroid resection as an equivalent strategy in properly selected patients, the 2015 ATA guidelines have adopted a risk-based management strategy that considers thyroid lobectomy as a treatment option for select tumors larger than 1 cm and no larger than 4 cm.² A selective approach to RAI ablation has become favored in low-risk patients; therefore, the use of total thyroidectomy specifically as preparation for RAI administration in treatment or follow-up has become a less important rationale. In 50% to 75% of patients, the presence of the remaining thyroid lobe may obviate the lifelong need for thyroid hormone replacement therapy. Therefore, if a patient is considered to have equivalent long-term disease outcomes with thyroid lobectomy and without RAI treatment or suppression therapy, that patient would be best served by limiting the aggressiveness of treatment, minimizing adverse events, and maximizing quality of life. Total thyroidectomy is preferred if the treatment strategy is to include postoperative RAI imaging or therapy. This preference is most clearly applicable to the high-risk groups. For patients at intermediate risk, total thyroidectomy or lobectomy may serve as the surgical platform for an overall treatment plan. Features that place the patients at increased risk for recurrent disease or for concomitant contralateral disease that are delineated in the ATA guidelines may inform the decision to use total thyroidectomy to preserve the option of postoperative RAI therapy or to resolve questions of bilateral disease. We believe that the patient's best interest is served by working with a multidisciplinary team that can coordinate and personalize this decision making before the initial surgical treatment plan.⁷

Conclusions

As we come to understand the biology of DTC, we must adapt treatment strategies that attempt to provide early definitive management in high-risk patients while avoiding overtreatment and its incumbent adverse effects in those with low-risk disease. The ATA guidelines have become sufficiently detailed and personalized to address these issues in thyroid cancer management.

The third iteration of the ATA guidelines stands to enhance patient care through promotion of a personalized, risk-based analysis in the management of DTC. Ultimately, the optimal management of DTC requires a balanced discussion between the patient and the multidisciplinary treatment team involving all available treatment options with their associated benefits and shortcomings. This discussion will help the patient to choose a treatment plan that provides them with the most overall value.

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