Management of Well-Differentiated Thyroid Cancer

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KEYWORDS

• Evidence-based otolaryngology • Well-differentiated thyroid cancer
• Follicular carcinoma • Papillary carcinoma • Neck dissection

KEY POINTS

The following points list the level of evidence as based on grading of the Oxford Centre for Evidence-Based Medicine. Additional critical points are provided, and points here are expanded at the conclusion of this article.

- Clinical staging with appropriate imaging can allow for planning of surgical management and should include preoperative ultrasonography, or alternative methods of computed tomography, magnetic resonance imaging, or positron emission tomography. Evidence level A.
- Suspicious lymph nodes should be assessed for malignancy using ultrasound-guided fine-needle aspiration. Evidence level A.
- Tumors larger than 1 cm should be resected via near-total or total thyroidectomy. Evidence level A.
- Tumors smaller than 1 cm may be initially managed via total lobectomy. Evidence level A.
- All presurgically involved levels of lymph nodes should be resected via compartment resection rather than berry picking. Evidence level A.
- Lateral neck involvement warrants compartment resection of at least levels II-A, III, and IV. Evidence level A.

OVERVIEW

Thyroid cancer is the most common of all endocrine cancers. Well-differentiated thyroid cancer comprises the majority of thyroid cancers, about 90%, and includes both papillary and follicular carcinomas. Most of these, about 85%, are of the papillary subtype. The incidence of thyroid cancer has been reported to be increasing, mostly due to increased detection rates, with one study showing a 2.4-fold increase from 3.6 per 100,000 in 1973 to 8.7 per 100,000 in 2002.[1] Overall mortality in this study was low, at 0.5 deaths per 100,000.

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In 2006, a task force within the American Thyroid Association (ATA) developed a set of guidelines for the management of thyroid nodules and differentiated thyroid cancer. These guidelines were most recently revised in 2009.[2] Nevertheless, not all of the recommendations have Grade A evidence and there are still many areas of controversy regarding surgical management.

EVIDENCE-BASED CLINICAL ASSESSMENT FOR THYROID CANCER

Staging

Accurate staging is important in determining the prognosis and tailoring the treatment of patients with differentiated thyroid cancer. Unlike with many other tumor types, the presence of distant metastasis, for example in lungs and bones, does not obviate primary resection (thyroidectomy) because metastatic disease may respond to radioactive iodine therapy (RAI) after surgical removal of neck disease.[3] Surgery comprises removal of all thyroid tissue along with the primary tumor, as well as that of regional nodal disease, and is one of the most important initial treatments. Complete resection of the thyroid gland and locoregional disease is particularly important for facilitating RAI for metastatic disease. Furthermore, patients having 5 or more clinically apparent metastases, a metastasis greater than 3 cm, or extranodal tumor extension were found to have a more adverse prognosis than those having none of these features.[4] Therefore, it is important to assess the extent of local disease and regional lymph node involvement before surgery.

Imaging: Ultrasonography

Preoperative ultrasonography is the most important imaging modality in the evaluation of thyroid nodules and thyroid cancer. The ATA Surgery Working Group guidelines recommend ultrasonography of the lateral neck to assess for metastatic nodes when thyroid cancer is diagnosed.[2] Ultrasonography identifies suspicious cervical adenopathy in the setting of thyroid malignancy. The sensitivity of detecting metastatic nodes that may alter overall management ranges from 20% to 31%.[5,6] Sonographic features suggestive of metastatic lymph nodes are:

- Cystic change
- Calcifications
- Loss of the fatty hilus
- A rounded rather than oval shape
- Hypoechogenicity
- Increased vascularity

Of these, detection of loss of the fatty hilus is 100% sensitive, but has very low specificity (29%).[7,8] The only criterion with high sensitivity as well as relatively high specificity is peripheral vascularity (86% sensitivity, 82% specificity). All other potential criteria have sensitivity of less than 60%, and are thus inadequate for use as a single criterion for the identification of malignancy.[9]

In a series of 3874 patients, Ito and colleagues[4] investigated the diagnostic accuracy of ultrasonography for lateral node metastasis in patients who underwent therapeutic or prophylactic modified neck dissection, reporting a specificity of 95% and a sensitivity of 43%. The presence of certain features, while low in sensitivity, can be highly specific for metastasis. For example, in a patient with known papillary thyroid cancer, the presence of cystic areas or punctate microcalcifications in a node are virtually diagnostic of metastasis (100% specificity). A lymph node short axis of less than 5 mm is also highly specific for metastasis (96%). Thus, an ultrasound scan can potentially alter the surgical approach in as many as 20% of patients.[10,11]