



ELSEVIER

Contents lists available at ScienceDirect

Surgery

journal homepage: www.elsevier.com/locate/ymsy

American Association of Endocrine Surgeons

Importance of surgeon-performed ultrasound in the preoperative nodal assessment of patients with potential thyroid malignancy

Rosebel Monteiro, MD ^a, Amy Han, BS ^b, Muhammad Etiwy, MD ^b,
 Andrew Swearingen, MD ^b, Vikram Krishnamurthy, MD ^b, Judy Jin, MD ^b,
 Joyce J. Shin, MD ^b, Eren Berber, MD ^b, and Allan E. Siperstein, MD ^{b,*}

^a Department of Endocrine Surgery, The Cleveland Clinic Foundation, Cleveland, OH

^b Case Western Reserve School of Medicine, Cleveland, OH

ARTICLE INFO

Article history:

Accepted 6 October 2017

Introduction. A comprehensive cervical ultrasound evaluation is essential in the operative planning of patients with thyroid disease. Reliance on radiographic reports alone may result in incomplete operative management as pathologic lymph nodes are often not palpable and evaluation of the lateral neck is not routine. This study examined the role of surgeon-performed ultrasound in the evaluation of patients who underwent lateral neck dissection for thyroid cancer.

Methods. We conducted a retrospective review of a prospectively maintained database of patients who underwent therapeutic lymph node dissection for thyroid cancer between 2001 and 2016 at our tertiary referral center. All patients had surgeon-performed ultrasound preoperatively by 1 of 7 endocrine surgeons. These findings were compared with prereferral imaging studies to determine the value of surgeon-performed ultrasound to their overall treatment.

Results. Of 92 patients who underwent thyroidectomy with lateral neck dissection, 97% had prereferral imaging of the neck (ultrasonography, computed tomography, positron emission tomography). Of these patients, nodal disease was suggested by computed tomography scanning in 70.8% and by ultrasonography in 54%. Of all patients, 45% had positive lateral neck nodes detected only on surgeon-performed ultrasound despite prior neck imaging. Nodal disease was identified in 50% of patients with only 1 study and 50% of patients with greater than 1 study before surgeon-performed ultrasound. Of patients with nodes detected by surgeon-performed ultrasound, only 67% had a prereferral diagnosis of thyroid cancer.

Conclusions. Our data demonstrate that reliance on standard preoperative imaging alone would have led to an incorrect initial operation in 45% of our patients. Awareness of the limitations of prereferral imaging is important for surgeons treating patients with thyroid and parathyroid disease. Surgeon-performed ultrasound is a useful tool in the diagnosis and accurate staging of patients.

© 2017 Elsevier Inc. All rights reserved.

Introduction

Ultrasonography (US) is a noninvasive, low-cost imaging modality that has had widespread utility in the detection, diagnosis, and treatment of patients with thyroid and parathyroid disease. The value of surgeon-performed ultrasound (SUS) has broadened to include the characterization of benign and malignant thyroid disease, evaluation of the lymph nodes, performance of fine-needle aspiration (FNA) of the lesion or the lymph node, intraoperative localization of disease, as well as postoperative surveillance of recurrence.^{1,2} High-resolution US has previously been shown to

modify the surgical approach in up to 40% of patients with thyroid cancer.³ Cervical lymph node metastasis occurs in up to 30% of patients with papillary thyroid carcinoma,⁴ while medullary thyroid carcinoma demonstrates early nodal metastases in up to 50% of patients.⁵ Earlier studies have also demonstrated that SUS of the lateral neck is reliable with a high sensitivity and negative predictive value.⁶ Sonographically detectable nodal metastases in the lateral compartment have been shown to be indicators of local recurrence, as well as poorer relapse-free survival in patients with papillary thyroid cancer.^{7,8} Furthermore, the 2015 American Thyroid Association (ATA) guidelines recommend that US evaluation of the anterior cervical lymph node compartments (central and lateral) be performed when thyroid nodules are detected.⁹ Thus, in patients presenting with documented or potential thyroid cancer, accurate preoperative staging, particularly of the lateral neck, is essential for the management of all identifiable disease with a single operation. Additionally, SUS has the potential to decrease the number of costly and time-consuming appointments for the patient and reduce

Presented at the 38th Annual Meeting of the American Association of Endocrine Surgeons.

* Reprint requests: Allan E Siperstein, MD, Case Western Reserve School of Medicine, Cleveland, OH.

E-mail: sipersa@ccf.org.

<https://doi.org/10.1016/j.surg.2017.10.005>

0039-6060/© 2017 Elsevier Inc. All rights reserved.

the number of expensive and invasive studies before definitive surgical treatment. Thus, surgeons should work toward a thorough preoperative staging so that the appropriate extent of surgery is performed at the initial operation.

At our institution, all patients referred for thyroid or parathyroid disease routinely undergo SUS that includes a complete examination of the lymph nodes in the central (level VI) and lateral neck (levels II–V) regardless of the initial reason for referral or the presenting diagnosis. Sonographic features that should arouse suspicion of nodal metastases include round shape, increased size, irregular margins, calcifications, cystic components, peripheral vascularity, replaced fatty hilum, and heterogeneous echo texture.^{10,11} Our clinical observation is that in many patients, especially in patients with thyroid cancer, prereferral imaging often lacked details about structural neck nodal disease. Thus, reliance on prereferral imaging alone may result in incomplete initial preoperative staging and operative management with the potential need for a reoperation.

In terms of preoperative surveillance, earlier studies have discussed the importance of preoperative cervical US and its accuracy in identifying nodal disease.^{12,13} It has been previously reported that central neck lymph nodes may be missed because of shadowing from tumors. However, at the time of index thyroidectomy, these central nodes are easily discovered as they are in the field of dissection. In contrast, the lateral compartment nodes are not routinely explored and are not in the operative field. Thus, accurate staging of the lateral neck is essential for planning the appropriate initial operation, as detecting lateral neck disease can address all identifiable disease in a single operation and decrease the potential for a re-operation.

Earlier studies have not evaluated patients who are referred to endocrine surgeons with nodular thyroid disease or thyroid cancer with incomplete staging of the lateral neck on prereferral imaging. The purpose of this study is to systematically evaluate patients who underwent total thyroidectomy with therapeutic lateral neck dissection as the initial operation to assess the value of SUS to their overall treatment.

Methods

This was an institutional research board–approved retrospective analysis of patients from a prospectively maintained database. This database was queried for patients who underwent therapeutic lymph node dissection for thyroid cancer at the Cleveland Clinic from January 1, 2001, to October 31, 2016. Before surgical referral, no imaging studies are routinely ordered by our surgeons. The prereferral imaging studies in our study were generally ordered by the referring physician (endocrinologist, primary care provider, etc); whereas all patients underwent SUS preoperatively by 1 of 7 endocrine surgeons. When SUS detects lateral neck cervical lymph nodes that are sonographically suspicious for thyroid cancer, FNA of the abnormal lymph nodes is performed for cytology and washout for thyroglobulin measurement routinely in all cases.^{9,14} Therapeutic central (level VI and VII) or lateral neck dissection (levels II–IV [upper, middle, and lower jugular nodes] and posterior triangle nodes [level V]) is then performed after FNA detection of malignancy or via elevated nodal thyroglobulin levels (normal <1 ng/mL). Our definition of lymph node dissections aligns with the 2012 ATA consensus statement.¹⁵ Although it is ideal to suspect central neck disease preoperatively, it is our practice to forgo performing FNA of suspicious central neck lymph nodes preoperatively because they are routinely sampled intraoperatively in patients with papillary thyroid cancer. A therapeutic central neck dissection is subsequently performed when and intraoperative frozen section reveals the presence of nodal metastases. In patients who are referred with a diagnosis of papillary thyroid cancer with no sonographically identifiable lateral neck disease, the lateral compartments are not explored.

We examined a group of patients who underwent total thyroidectomy with lateral neck dissection to determine the impact of SUS in patients who may have undergone an inadequate resection as a result of unassessed lateral neck disease. For these patients, findings of SUS were compared with prereferral imaging (group 1). Additionally, to assess the quality of our nodal surveillance, we studied patients who underwent initial surgery at our institution and were found to have lateral neck nodal disease at their 6-month postoperative oncologic follow-up visit, suggesting that this was missed at initial evaluation (group 2). We made the presumption that this was missed disease rather than interval progression of aggressive or evolving disease in order to assess the quality of our nodal surveillance. A 6-month period was chosen as this is the typical time frame for the initial post-operative longitudinal tumor surveillance after potential adjuvant radioactive iodine therapy. This time frame allows for adequate thyroid-stimulating hormone (TSH) suppression and monitoring of thyroglobulin levels and facilitates performance of high-quality US after postoperative changes have settled.

Demographic and clinical data, biochemical and prereferral imaging, FNA results, extent of operation performed, and pathology from institutional review board–approved databases and patients' records were retrospectively reviewed.

Results

This was a series of 92 patients who underwent total thyroidectomy and lateral neck dissection at our institution (group 1). Of these patients, 92% had papillary thyroid cancer and 8% had medullary thyroid cancer. Basic demographic data and operative characteristics including gender, age, BMI, and number and size of malignant nodes on final pathology are summarized in the [Table](#).

In all patients who eventually underwent total thyroidectomy with lateral neck lymph node dissection, 45% had disease initially detected on SUS ([Fig 1](#)). In 55% of patients, nodal disease was detected before the surgeon's evaluation. In these patients with nodal disease detected before surgical evaluation, 61% had disease detected on US, 29% on CT, and 10% on magnetic resonance imaging (MRI). Among these patients with nodal disease detected on imaging studies before referral, only 22% of patients had lymph node FNA performed before surgical referral. The remaining 78% of patients had nodes reported on prereferral imaging, but FNA was not performed. The presence of lymph nodes was commonly mentioned on CT scan reports; however, the presence of these nodes did not necessarily indicate metastatic disease as no biopsy-proven diagnosis had occurred. SUS was utilized in these cases to confirm a tissue diagnosis and to accurately stage the patient.

Before referral to a surgeon, 97% of patients (89/92) underwent at least one prereferral imaging study. Eighty-nine patients underwent a total of 124 studies before referral as some patients had more than 1 imaging study ([Fig 2](#)). Seventy-four percent of the patients underwent a prereferral US with 34% of patients that underwent an isolated US study, whereas 35% had a concurrent CT scan and 5% had a concurrent MRI/PET scan. Of the remaining patients, 19% underwent CT scan alone, and 4% underwent a PET/MRI scan

Table
Patient demographics

Age (average in years)	43 ± 16.5 (11–75)
Body mass index (average)	28.6 ± 6.9 (17–55)
Papillary thyroid carcinoma	91.30%
Medullary thyroid carcinoma	8.70%
Number of lateral lymph node resected	19.7 ± 13.3
Number of malignant lymph node on pathology	9.9 ± 7.7 cm
Size of largest malignant lymph node (average)	2.3 ± 1.0 cm (0.1–5.3 cm)

Download English Version:

<https://daneshyari.com/en/article/8837340>

Download Persian Version:

<https://daneshyari.com/article/8837340>

[Daneshyari.com](https://daneshyari.com)