

Institutional experience with lateral neck dissections for thyroid cancer

Jason A. Glenn, MD,^a Tina W. F. Yen, MD, MS,^a Gilbert G. Fareau, MD,^b Azadeh A. Carr, MD,^a Douglas B. Evans, MD,^a and Tracy S. Wang, MD, MPH,^a Milwaukee, WI

Introduction. *Compartment-oriented neck dissection is recommended for patients with evidence of thyroid cancer metastases to lateral compartment lymph nodes. This study reviews the outcomes of patients who underwent lateral neck dissections (LND) at a high-volume institution.*

Methods. *This is a retrospective review of patients who underwent LND for metastatic thyroid cancer from January 2009 to June 2014. Preoperative evaluation, operative findings, and postoperative outcomes were analyzed.*

Results. *Ninety-six patients underwent 127 LNDs. Fine-needle aspiration (FNA) confirmed metastases in 82 lateral necks (65%). The remaining 45 LNDs (35%) were performed based on clinical suspicion of metastases; 29 (64%) had metastases on final pathology. Twenty patients had 26 complications, which included chyle leak (7 [6%]), spinal accessory nerve dysfunction (7 [6%]), neck seroma requiring drainage (2 [2%]), and surgical site infection (10 [8%]).*

Conclusion. *LND is associated with a risk of early postoperative morbidity, but long-term complications are uncommon in the hands of experienced surgeons. In patients with thyroid cancer, a comprehensive preoperative evaluation of the lateral neck with physical examination, ultrasonography, and possible FNA should be performed. For those with suspicion of metastases, LND can be an important therapeutic option, but discussion with the patient regarding potential risks and benefits is essential. (Surgery 2015;158:972-80.)*

From the Departments of Surgery^a and Medicine,^b Medical College of Wisconsin, Milwaukee, WI

THYROID CANCER is the ninth most common malignancy in the United States and accounts for 4% of new cancer diagnoses per year.¹ Approximately 90% of patients have differentiated thyroid cancers, of which papillary thyroid cancer is the most common.² In patients with locoregional disease, the 5-year overall survival for those who receive appropriate multidisciplinary treatment is typically excellent (>97%).¹ Despite this excellent prognosis, reoperative neck dissection for locoregional recurrence has been associated with considerable morbidity, such as hypoparathyroidism, chyle leak, and cervical nerve injuries.³ As a result, the prevention of disease recurrence and

minimization of operative morbidity are paramount in the management of locoregional thyroid cancer.

In patients with thyroid cancer, operative management is contingent on thorough physical and ultrasound examinations of the central and lateral neck compartments.⁴ Lateral neck lymph node abnormalities can be detected on preoperative ultrasound in 20–30% of patients with differentiated thyroid cancer.⁵ Current guidelines recommend lateral neck dissection (LND) for patients with clinical or radiographic evidence of lateral neck metastases (cN1b); when LND is performed, ≤83% will have lymph node metastases confirmed on final pathology.^{4,6} When there is no clinical evidence of metastatic lymphadenopathy (cN0), occult micrometastases have been reported in ≤40% of cases after prophylactic LND.⁶ However, prophylactic LND is not recommended for patients with differentiated thyroid cancer, because it has not been shown that resection improves disease-free or overall survival.⁴

Traditional radical neck dissections, in which nonlymphatic structures such as the spinal accessory nerve, internal jugular vein, and sternocleidomastoid muscle are routinely resected, have been associated with significant patient morbidity

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Reprint requests: Tracy S. Wang, MD, MPH, Associate Professor, Division of Surgical Oncology, Department of Surgery, Chief, Section of Endocrine Surgery, Medical College of Wisconsin, 9200 W. Wisconsin Avenue, Milwaukee, WI 53226. E-mail: tswang@mcw.edu.

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without improvement in disease-free survival.⁷ In contrast, a selective, compartment-oriented LND lowers operative morbidity by preserving these structures and avoiding the routine dissection of lymph nodes that have a low likelihood of metastases, such as levels I, IIb, and Va, in low-to-moderate risk patients. Still, chyle leaks and cervical nerve injuries remain the most common sources of morbidity ($\leq 8\%$ and $\leq 27\%$ of cases, respectively) after selective LND.⁸⁻¹¹ This study represents a large cohort of patients in which the routine use of surgical drains and physical therapy allowed for the early recognition of procedure-related complications. The aim of this study is to evaluate the outcomes of patients who underwent LND by experienced surgeons at a single high-volume medical center.

METHODS

This retrospective, medical record review of a prospectively collected single institution thyroid database included 1,130 patients who underwent a thyroid-related operation between January 2009 and June 2014. Adults (≥ 18 years) who underwent LND by 1 of 4 experienced endocrine surgeons were included for analysis. Demographic and clinical data, including preoperative evaluation (physical examination, ultrasonography, CT, and biopsy results), extent of surgery, pathologic review, procedure-specific complications, and postoperative follow-up data, were collected.

Cervical lymph nodes were categorized according to anatomic levels outlined by American Thyroid Association consensus statements (Fig 1, A).^{7,12} All patients underwent comprehensive high-quality ultrasound (8–14 MHz) evaluation of the thyroid gland and bilateral central and lateral neck compartments by a single group of radiologists; all ultrasound examinations were performed by a radiologist. Suspicious lymph node characteristics included: calcifications, cystic changes, loss of a fatty hilum, hypervascularity, and other abnormal morphology. Fine-needle aspiration (FNA), with or without measurement of thyroglobulin in the aspirate, was routinely performed on suspicious lymph nodes >5 – 8 mm in size. FNA of suspicious nodes was not performed if the results would not change the operative plan (LND was already planned owing to suspicious ultrasound findings, increased thyroglobulin levels, concurrent central neck metastases, and/or the presence of obvious gross disease) or if the location was not amenable to safe percutaneous sampling. LND was defined as the compartmental clearance of lymphatic and associated fibro-

adipose tissue in ≥ 1 nodal level from the lateral neck compartment (levels II–V; Fig 1, A).

At our institution, it is the routine practice to place 1–2 closed suction surgical drains at the time of LND; these drains remain until daily outputs decrease to <25 – 30 mL. Drains were not placed in select cases, based on the extent of dissection and at the discretion of the surgeon. For the purposes of this study, chyle leaks were defined by milky-white and/or high-volume (>200 mL/d for ≥ 2 days) drain output at any time in the postoperative period. Patients routinely received preoperative and intraoperative antibiotic prophylaxis, but no additional doses were given postoperatively for drain prophylaxis. Patients with clinical signs of peri-incisional infection who required antibiotic therapy were considered to have surgical site infections (SSI). Small presumed hematomas and seromas that did not require procedural intervention (drainage, reoperation) were not considered to be complications.

Cervical nerve injury was defined as pain out of proportion with an expected postoperative course and/or deficit of sensory/motor function in effectors innervated by the spinal accessory nerve, hypoglossal nerve, marginal mandibular nerve, brachial plexus, phrenic nerve, or sympathetic cervical plexus. All patients who underwent LND were assessed by a licensed physical therapist in the immediate postoperative period (within the first week). Physical therapy included routine range of motion exercises, and the duration of therapy depended on individual patient needs. Nerve dysfunction was considered temporary if symptoms lasted >3 months, and permanent if symptoms lasted >3 months.

The surgical team routinely assessed for cervical nerve injuries, infections, and seromas/hematomas postoperatively and then at each follow-up visit. Patients received education on the identification of common complications, and worked closely with advanced care practitioners and physical therapists in the outpatient setting. Patients recorded drain output after discharge and were instructed to notify the team for any increase or change in drain output. Continuous variables were evaluated using *t* tests and categorical variables were analyzed with χ^2 tests. All analyses were carried out with STATA version 13.0 (StataCorp, College Station, TX).

RESULTS

Of the 414 patients treated for thyroid cancer during the study period, 96 (23%) were found to have suspicion of lateral neck lymph node

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