Reoperative central-compartment lymph-node dissection (CLND) has a lower rate of temporary hypocalcemia and the same rates of other complications and recurrence as initial CLND

Shen WT, Ogawa L, Ruan D, Suh I, Kebebew E, Duh QY, Clark OH. Central neck lymph node dissection for papillary thyroid cancer: comparison of complication and recurrence rates in 295 initial dissections and reoperations. Arch Surg 2010;145:272-5.

SUMMARY

BACKGROUND

The American Thyroid Association management guidelines for patients with differentiated thyroid cancer recommend ipsilateral or bilateral prophylactic (routine) central-compartment lymph-node dissection (CLND) for patients with papillary thyroid carcinoma (PTC), especially for those with advanced primary tumors (T3 or T4). Some find that the complication rates of CLND may be lower with prophylactic dissection than with therapeutic dissection for patients with clinically apparent recurrent lymph-node metastases. This retrospective study was aimed at testing the hypothesis that the complication and tumor recurrence rates are lower with therapeutic CLND than with prophylactic CLND.

METHODS

This is a retrospective study of patients treated for PTC from 1998 through December 31, 2007, at the UCSF Mount Zion Medical Center by four endocrine surgeons (W.T.S, E.K., Q.Y.D., and O.H.C.) who performed 295 CLNDs for PTC. Patients selected for study were treated with total thyroidectomy and unilateral or bilateral CLND performed either at the time of initial surgery (prophylactic dissection) or at the time of reoperation for recurrence (therapeutic dissection).

Of 295 CLND operations, 189 were initial operations (64%) and the remaining 106 (36%) were reoperations performed for enlarged CLND tumors. Reoperative CLND was defined as a central (level IV) lymph-node dissection for patients who had prior surgery. This group of patients had growth of previously non-enlarged (i.e., inapparent) central neck lymph nodes or growth of central neck lymph nodes that were incompletely resected during a prior operation.

The main characteristics identified in the cancer registry database were records of patients who had lymphadenectomy in addition to CLND and postoperative complications comprising neck hematoma, transient or permanent hypoparathyroidism, and transient hoarseness or permanent recurrent laryngeal-nerve injury. Transient hypoparathyroidism was defined a serum calcium level less than 8.0 mg/dl within 24 hours after surgery. Permanent hypoparathyroidism was defined as a serum calcium level less than 8.0 mg/dl with low parathyroid hormone levels requiring oral calcium carbonate and calcitriol for more than 6 months.

Transient hoarseness was based on the surgeon's assessment of the patient's subjective symptoms during the immediate postoperative period. Permanent recurrent laryngeal-nerve injury was defined by persistent hoarseness for 6 months after surgery, which was confirmed by direct laryngoscopy documenting ipsilateral vocal-cord dysfunction.

RESULTS

Patient Demographics (Figure 1)

Although the demographic profiles of the two surgery groups were similar, patients who had reoperation were slightly older. A total of 54 men (28.6%) and 135 women (71.4%), with a mean (±SD) age of 39.8±16.0 years, had CLND during their initial surgery . On the other hand, 33 men (31.1%) and 73 women (68.9%), with a mean age of 46.5±16.8 years, had reoperative CLND.

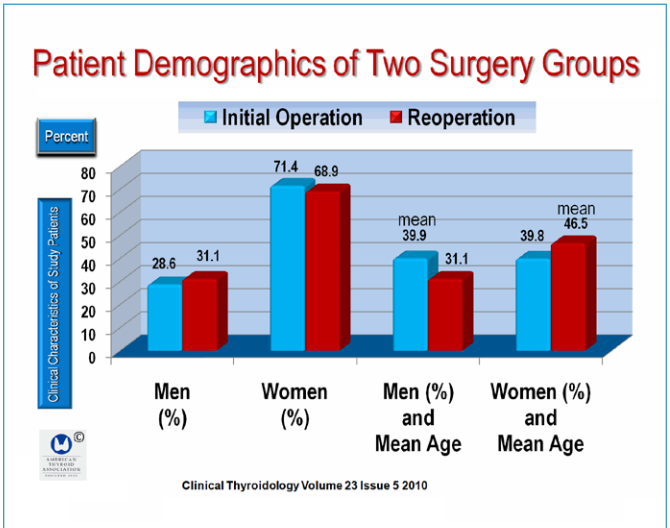

Figure 1. This figure shows the patient demographics in the initial and reoperation treatment groups.

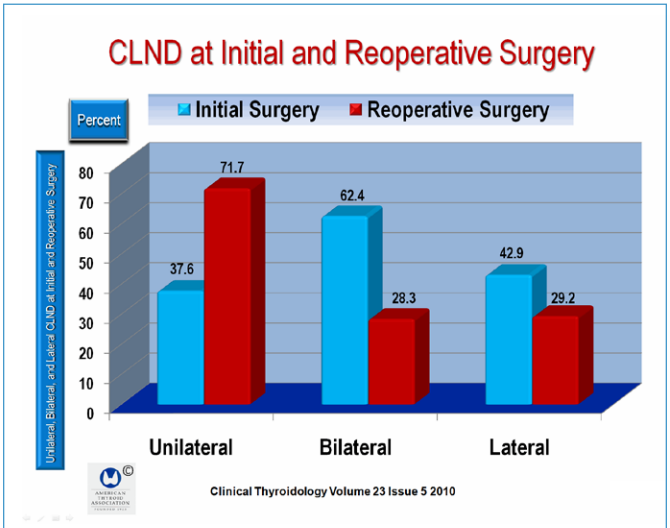

Figure 2. This figure shows the CLND sites in the initial surgery and reoperative surgery groups.

Differences in CLND at Initial and at Reoperative Surgery (Figure 2)

Among the 189 initial CLND procedures, 71 (37.6%) were unilateral and 118 (62.4%) were bilateral. However; among the reoperative CLND procedures, 76 of 106 were unilateral dissections (71.7%) as compared with 30 of 106 bilateral (28.3%). Lateral neck lymph-node dissections were performed at cervical levels II III, and IV, when involved, in 81 of 189 initial CLND procedures (42.9%) as compared with 31 of 106 reoperative CLND procedures (29.2%).

Complication Rates (Figure 3)

Nerve monitoring using a nerve-integrity monitor system was used in 20 (10.6%) of the 189 initial operations and in 16 (15.1%) of 106 reoperations. The complication rates for initial surgery were similar with those in the reoperative surgery. Two patients (1.1%) required postoperative reexploration for a hematoma. Of the initial operations, 2 patients required reexploration.

Temporary postoperative hoarseness occurred in 9 patients (4.8%) as a result of the initial operation and in 5 (4.7%) as a result of reoperation. Permanent recurrent laryngeal-nerve injury confirmed by laryngoscopy was found in 5 (2.6%) of the patients who had initial operations and in 2 who had reoperations (1.9%).

The rates of transient postoperative hypocalcemia were significantly different between the two groups: 79 of 189 initial operations (41.8%) as compared with 25 of 106 reoperations (23.6%) (P = 0.0025). Only one patient in each group (0.5% and 0.9%, respectively) had permanent hypoparathyroidism. Of the 189 patients who had initial operations, 31 (16.4%) required autotransplantation, as compared with only 1 (0.9%) in 106 reoperative operations (P<0.001). Of the final operative specimens, 62 (32.8%) of the initial CLND specimens contained normal parathyroid glands, as compared with 10 (9.4%) of the reoperative CLND specimens.

Average Number of Lymph Nodes in the Two Surgical Groups (Figure 4)

The average number of lymph nodes was 8 for the initial surgery and 5 for reoperations. The average number of positive central lymph-nodes was 4 of 8 (50%) for the initial operations and 3 of 5 (60%) of the reoperations. The average number of lymph nodes retrieved in the CLND was about the same in the two groups: 7 of 18 (39%) for initial operations and 6 of 17 (35%) for reoperations.

Recurrence Rates for the Two Surgical Groups (Figure 5)

PTC recurrence rates were similar in the two groups. Of the 189 patients who had initial CLND, 49 (25.9%) had locoregional or distant recurrences of their disease that required reoperation or other therapy. Of the 106 reoperative CLNDs, 31 (29.2%) had a recurrence. The recurrence was in the central neck for 22 (11.6%) of the initial CLND and 15 (14.1%) of the reoperations. Recurrence was found in the lateral neck in 41 (21.7%) of the initial operations and 18 (17.0%) of the reoperations.

CONCLUSION

This study finds that reoperative CLND has a lower rate of transient hypocalcemia and the same rate of other complications and of tumor recurrence as initial CLND surgery for PTC.

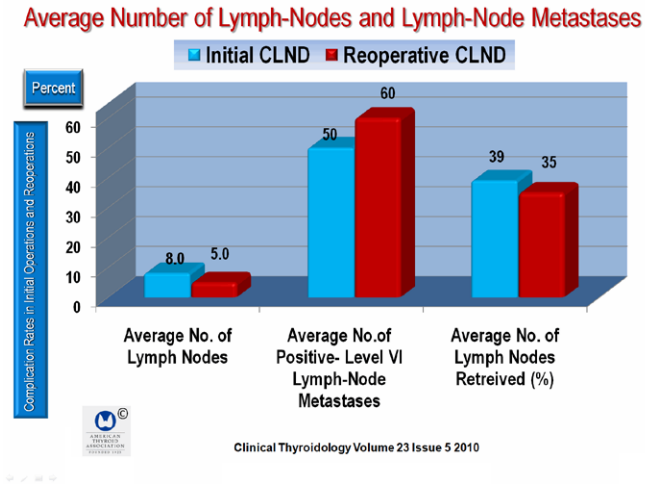

Figure 4.The average number of lymph-node metastases

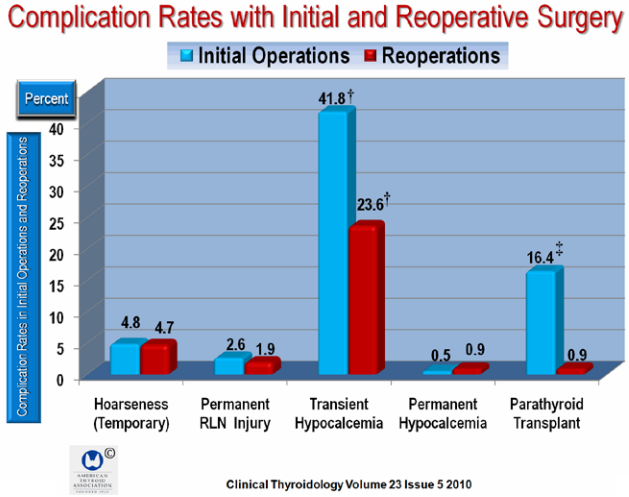

Figure 3. This figure shows the complication rates with initial and reoperative CLND surgery. †P = 0.0025. ‡P<0.001.

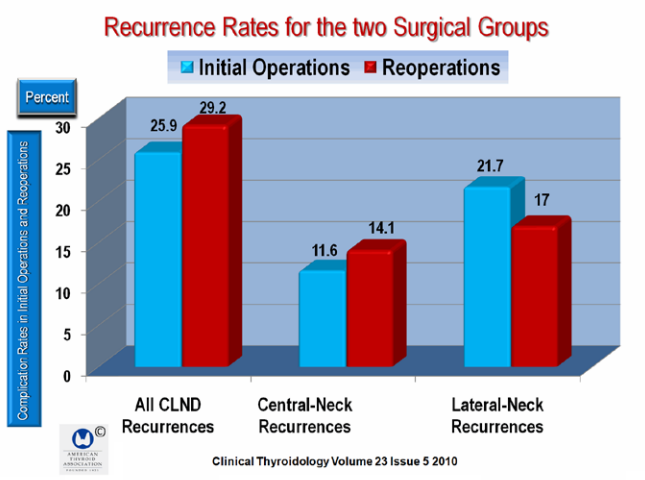

Figure 5. ??

COMMENTARY

This is a large retrospective study performed by four highly experienced endocrine surgeons who perform CLND at the time of initial surgery only if enlarged central lymph nodes are detected by palpitation or ultrasonography. The authors had hypothesized that the complication and recurrence rates would be higher in patients who underwent reoperation for CLND because of scarring in the reoperative field and distorted anatomy in the central-neck compartment after thyroidectomy has been performed. However, just the opposite was found: the complication and recurrence rates that occurred with initial surgery were similar to that found with reoperative CLND, with the highest risk of transient hypocalcemia in patients having initial CLND along with total thyroidectomy. The authors mention that their rates of transient hypocalcemia for total thyroidectomy alone in patients with PTC are significantly lower (approximately 10%, unpublished data) than the rates of transient hypocalcemia for patients who were td with CLND (41.8%), underscoring the underlying risk for injury to the parathyroid glands. Still, the rates of permanent hypoparathyroidism in this study are considerably lower than usual, in the range of 0.5 to 0.9% for both initial and reoperative CLND. Despite favorable outcomes, the authors argue that their findings that CLND, whether initial or reoperative, contributes additional risk of postoperative complications. It is difficult to compare the recurrence rates in this study without further information concerning the tumor and patient features.

An evidence-based systematic review of this issue by White et al. (1) reached three major conclusions:

First: Systematic compartment-oriented central lymph-node dissection (CLND) may decrease recurrence of PTC (levels IV and V data (No recommendation)

Second: There may be a higher rate of permanent hypoparathyroidism and unintentional permanent nerve injury when CLND is performed with total thyroidectomy as compared with total thyroidectomy alone (Grade C recommendation).

Third: Reoperation in the central neck compartment for recurrent PTC may increase the risk of hypoparathyroidism and unintentional nerve injury as compared with total thyroidectomy with or without CLND (Grade C recommendation), supporting a more aggressive initial operation.

White et al. concluded that evidence-based recommendations support CLND for PTC in patients under the care of experienced endocrine surgeons (1).

A recent debate between Drs. G.M Doherty and D.L. Steward summarized the pro and con views of complication rates in patients who have had CLND (2). Given the high odds of leaving residual CLND lymph-node metastases by forgoing prophylactic CLND leaves two options for the patient: watchful waiting, which in some cases can span decades, or empiric radioiodine therapy, which may eradicate the thyroid remnant and smaller lymph-node metastases. A recent study by Bonnet et al. (3,) provides important information concerning prophylactic neck compartment dissections as it relates to the extent of initial lymph-node compartment surgery and the use of postoperative radioiodine ablation therapy. I believe the Bonnet study is a landmark means of identifying the residual lymph-node metastases that require radioactive iodine therapy 4.

There seems to be a consensus that prospective, randomized studies must be done before we can settle the uncertainties of this surgical approach to the management of differentiated thyroid cancer.

— Ernest L. Mazzaferri, MD, MACP

References

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