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Bilateral Central-Node Dissection with Total Thyroidectomy for Papillary Thyroid Cancer Often Results in Permanent Hypoparathyroidism

Giordano D, Valcavi R, Thompson GB, Pedroni C, Renna L, Gradoni P, Barbieri V. Complications of central neck dissection in patients with papillary thyroid carcinoma: results of a study on 1087 patients and review of the literature. Thyroid 2012;22:911-7. Epub July 24, 2012.

SUMMARY

Background

Because the incidence of micrometastases to central lymph nodes in the neck is high in patients with papillary thyroid carcinoma (PTC), many surgeons perform routine prophylactic central-neck node dissection (CND) along with total thyroidectomy as the initial treatment for PTC. However, this is a controversial practice and is not recommended as routine surgery for PTC by any of the major societies concerned with this issue. The potential benefit is based on studies showing that lymph-node metastases may decrease survival and on the fact that many lymph-node metastases are microscopic and not evident grossly at surgery. However, CND may increase the frequency of recurrent laryngeal-nerve paralysis (RLNP) as well as hypoparathyroidism.

The aim of the current study was to characterize the frequency of temporary and permanent RLN damage and temporary and permanent hypoparathyroidism caused by CND in patients with PTC. In addition, the authors reviewed the literature on this controversial subject.

Methods

This is a retrospective study from a group of otolaryngologists at a single institution in Reggio Emilia, Italy. During 1980–1996, patients with PTC were treated with total thyroidectomy without CND unless there were clinically overt lymph nodes in the central or lateral neck. Since 1997, patients diagnosed by cytopathology as having PTC with clinically negative neck lymph nodes were treated by total thyroidectomy with concomitant prophylactic ipsilateral CND. Patients were excluded from the study if they had previous thyroid or parathyroid surgery or neck irradiation.

The study included 1097 patients divided into three groups. Group A comprised 394 patients who had total thyroidectomy alone; B, 385 patients who had total thyroidectomy and concomitant prophylactic ipsilateral CND without evidence of ipsilateral pretracheal and paratracheal lymph node metastasis on intraoperative frozen-section pathology; and C, 308 patients who had total thyroidectomy and concomitant prophylactic bilateral CND because of evidence of lymph-node metastases on intraoperative frozen-section pathology.

Vocal-cord motility was assessed preoperatively and postoperatively. The albumin-adjusted total serum calcium level was measured preoperatively and postoperatively. Transient hypoparathyroidism was defined as postoperative hypocalcemia with an albumin-adjusted total serum calcium level less than 8.0 mg/dl. Permanent hypoparathyroidism was defined as persistent hypocalcemia 6 months after surgery requiring calcium and vitamin D supplements.

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Table 1. Incidence of Transient and Permanent RLNP and Transient and Permanent Hypoparathyroidism (%).

Group	A	B	C	P Value*
Transient RLNP	3.6	3.9	5.5	0.40 (NS)
Permanent RLNP	1.0	0.5	2.3	0.10 (NS)
Transient hypoparathyroidism	28	36	52	See below
Permanent hypoparathyroidism	6	7	16	See below

* NS denotes not significant.

Results

There was no significant difference in the incidence of transient or permanent RLNP among the three groups (Table 1). There were no cases of bilateral permanent RLNP.

Transient hypoparathyroidism was significantly more frequent in groups B (P = 0.014) and C (P<0.001) than in group A. Permanent hypoparathyroidism was significantly more frequent in group C (P<0.001) than in group A or B.

Conclusions

Limiting prophylactic CND associated with total thyroidectomy for PTC to the ipsilateral side may represent an effective strategy for reducing the rate of permanent hypoparathyroidism.

ANALYSIS AND COMMENTARY

Prophylactic CND in patients with PTC is a contentious topic, as summarized in the discussion of this paper and in an excellent recent review (1) in which two prominent surgeons take divergent positions on this issue. In their review of the literature, the current authors found that the rate of transient RLN injury ranged from 0% to 7.3%, similar to the overall rate of 4.2% they reported in groups B and C together; the rate of transient hypoparathyroidism ranged from 14% to 60%, similar to their rate of 37.5%. In regard to the permanent complications, their rate of RLN damage was 1.2%, similar to the literature review, which showed 0 to 5%, and their rate of hypoparathyroidism of 9.4% was in line with the literature, which reports a rate ranging from 4% to 11%. In contrast with the current report, a meta-analysis of five studies, including 1132 patients studied by an English group, concluded that performing prophylactic CND at the same time as thyroidectomy resulted in no increased permanent morbidity (2).

It is important to note that, in the current study, the rate of permanent hypoparathyroidism increased only when bilateral CND was performed, and this procedure was necessitated by the finding of tumor in frozen sections of nodes that were sampled for this purpose. This prompts the question of whether the procedure is prophylactic when positive nodes led to the decision to perform bilateral CND. However,

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surgeons who do not favor CND probably do not perform sampling for frozen section of grossly normal nodes. Another limitation of this study is that the total thyroidectomy without CND in group A was performed in an earlier era, so that the groups are not truly comparable.

My current viewpoint is that I leave it to my excellent surgeon to make the decision about CND based on the findings at surgery, and I do not choose a surgeon for my patients based on this issue.

— Jerome M. Hershman, MD

References

1. Mazzaferri EL, Doherty GM, Steward DL. The pros and cons of prophylactic central compartment lymph node dissection for papillary thyroid carcinoma. Thyroid 2009;19:683-9.
2. Chisholm EJ, Kulinskaya E, Tolley NS. Systematic review and meta-analysis of the adverse effects of thyroidectomy combined with central neck dissection as compared with thyroidectomy alone. Laryngoscope 2009;119:1135-9.