Modified Radical Neck Dissection Is Better Than Partial Dissection of Lymph Nodes

Shiro Noguchi · Hiroto Yamashita ·
Shinya Uchino

Published online: 14 November 2008
© The Author(s) 2008. This article is published with open access at Springerlink.com

Abstract

Background For papillary thyroid cancer, lymph node excision may be less important for smaller tumors and rather limited node excision might be sufficient to prevent recurrence.

Methods We compared patients who had undergone modified radical neck dissection with patients who had undergone limited node basin excision. Between 1967 and 1996, 4966 patients at our institution had resection of pure papillary carcinoma tumors larger than 11 mm.

Results In patients whose tumors were larger than 25 mm without local adhesion, modified radical neck dissection had a significantly better prognosis compared to that of more limited node excision. For patients with a primary tumor larger than 11 mm, modified radical had a better prognosis than partial node excision only if there was adhesion or invasion to the recurrent nerve, jugular vein, common carotid artery, vagus nerve, or trachea.

Conclusion The size of papillary cancer of the thyroid directly affects prognosis and the role of nodal dissection.

excision might be sufficient to prevent recurrence. We compared patients who had undergone modified radical neck dissection with patients who had undergone limited node basin excision.

Patients

Between 1967 and 1996 in our institution, 4966 patients had resection of pure papillary carcinoma tumors larger than 11 mm. Among a separate group of 1960 patients, most had microcarcinoma (≤ 10 mm) and/or no identified invasion to adjacent tissue. Sixteen percent of those patients had limited node excision (partial node excision) because of small primary tumors and no evidence of invasion. Patients who had modified radical neck dissection had larger primary tumors (Table 1).

Results

Regardless of lymph node status, tumor size is an important risk factor for outcome from papillary carcinoma of the thyroid (Fig. 1). However, for smaller tumors, the extent of lymph node dissection is not associated with a change in cause-specific survival. Only when the primary tumor was more than 25 mm, regardless of invasion, was the survival curves' difference significant between modified radical neck dissection and less extensive dissection (Fig. 2).

For patients in whom the primary tumor was 11 mm or larger and invasion or adhesion to the recurrent laryngeal nerve was present, the cause-specific survival difference was highly significant in favor of modified radical node excision (MRND) (Fig. 3). For patients whose primary tumor was larger than 11 mm and the invasion or adhesion

Introduction

High-resolution ultrasonography and fine-needle aspiration cytology have improved thyroid cancer detection. In particular, the average size of the primary tumor is smaller than 15 years ago. With smaller tumors, lymph node excision may be less important and rather limited node

S. Noguchi (✉) · H. Yamashita · S. Uchino
Noguchi Thyroid Clinic & Hospital Foundation,
6-33 Noguchi-Nakamachi, Beppu, Oita 874-0932, Japan
e-mail: s1937n@noguchi-med.or.jp

Table 1 Size of primary tumor in relation to lymph node surgery

Type of node surgery	Median size (mm)	Mean $\pm$ SD
Modified radical neck dissection	23	25.1 $\pm$ 13.1
Partial node excision	12	15.6 $\pm$ 12.6
No node excision	5	9.2 $\pm$ 11.5

Fig. 1 Cause-specific survival for all papillary thyroid cancer patients separated by primary tumor size regardless of nodal involvement, metastases, or operative procedure **Fig. 2** Cause-specific survival for patients with tumors greater than 25 mm in primary size

was to the jugular vein, the cause-specific survival again favored MRND (Fig. 4). If the primary tumor was larger than 11 mm and there was invasion or adhesion to the carotid artery, the cause-specific survival curves were statistically significant in favor of MRND (Fig. 5). If the primary tumor was larger than 11 mm and there was invasion or adhesion to the cervical part of the vagus nerve, there was a statistically significant difference of survival

Fig. 3 Cause-specific survival for patients whose primary tumor was 11 mm or larger with invasion or adhesion to the recurrent laryngeal nerve and who had modified neck dissection or more limited neck dissection **Fig. 4** Cause-specific survival for patients whose primary tumor was 11 mm or larger with invasion or adhesion to the jugular vein and who had modified neck dissection or more limited neck dissection

curves in favor of MRND (Fig. 6). Finally, if the primary tumor was larger than 11 mm and there was invasion or adhesion to the trachea, the difference between MRND and more limited dissection based on cause-specific survival curves was significant according to the Wilcoxon test but not according to the log-rank test (Fig. 7).

Discussion

The hypothesis of this project was that diagnoses of smaller thyroid cancer (now the majority of cases) might require different nodal management. Well-trained physicians can perform fine-needle aspiration cytology from very small

Fig. 5 Cause-specific survival for patients whose primary tumor was 11 mm or larger with invasion or adhesion to the carotid artery and who had modified neck dissection or more limited neck dissection

Fig. 7 Cause-specific survival for patients whose primary tumor was 11 mm or larger with invasion or adhesion to the trachea and who had modified neck dissection or more limited neck dissection

Fig. 6 Cause-specific survival for patients whose primary tumor was 11 mm or larger with invasion or adhesion to the cervical portion of the vagus nerve and who had modified neck dissection or more limited neck dissection. There was a statistically significant advantage to MRND

(3 × 3 × 4 mm) thyroid cancer under ultrasonographic guidance. Thus, the incidence of thyroidal microcarcinoma has increased dramatically, along with the occurrence of slightly larger tumors.

Papillary cancers larger than 25 mm in the largest dimension usually have adhesion and invasion to surrounding tissue or organs and very likely have nodal metastasis. In that situation modified radical neck dissection is better than partial node excision. When adhesion to the recurrent nerve is present, often small lymph nodes with metastases can be identified behind the nerve.

Invasion of the recurrent nerve, and often of the muscular layer of the esophagus, by the primary tumor can also be involved. A primary tumor rarely invades the jugular vein, but nodal metastases invade the jugular vein; also, rarely does the primary tumor spread through the inside of the vein.

Nodal metastasis sometimes invades the adventitia of the carotid artery. Usually the area of invasion is narrow, otherwise adventitia raveling can occur. When numerous large nodal metastases are present and the vagus nerve is invaded, it is because the nerve is located at the back of the carotid artery. Because the trachea adheres to the thyroid gland naturally, it is not surprising that adherence and morbidity by invasion into local neck structures are common.

Conclusion

The size of papillary cancer of the thyroid directly affects prognosis. In patients whose tumors were larger than 25 mm without local adhesion, modified radical neck dissection had a significantly better prognosis than more limited node excision. For patients with a primary tumor larger than 11 mm, modified radical had a better prognosis than partial node excision if there was adhesion or invasion to the recurrent nerve, jugular vein, common carotid artery, vagus nerve, or trachea.

Open Access This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author(s) and source are credited.