Is a Bilateral Modified Radical Neck Dissection Beneficial for Patients with Papillary Thyroid Cancer?

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Abstract

Purpose. We previously reported a poor prognosis in papillary thyroid carcinoma patients with recurrence in the contralateral cervical lymph nodes after thyroidectomy and ipsilateral modified radical neck dissection (MRND) with a curative intent. The aim of this study was to investigate whether bilateral MRND improved prognosis in patients at risk for contralateral nodal recurrence.

Methods. We retrospectively reviewed the cases of 86 patients with contralateral nodal metastasis who underwent a thyroidectomy with bilateral MRND (group 1) and the cases of 32 patients who suffered contralateral nodal recurrence after a thyroidectomy with ipsilateral MRND (group 2).

Results. Although tumor progression was considered similar in patients from groups 1 and 2, group 1 developed fewer distant metastases than group 2 (6.8% vs 31.1%), thus resulting in a lower cancer death rate (5.8% vs 28.1%). Group 1 had a better 10-year survival rate than of group 2 (97.1% vs 83.7%).

Conclusion. Bilateral MRND during initial surgical management is thus considered to improve the prognosis of some papillary carcinoma patients at risk for recurrence in the contralateral cervical lymph nodes.

Key words Thyroid cancer · Papillary carcinoma · Operation · Modified radical neck dissection

Introduction

Because papillary thyroid carcinoma is an indolent disease and is associated with a relatively good prognosis, the prognostic significance of nodal metastasis and its optimal management have been topics of considerable controversy.1 We and other groups have reported that nodal metastasis is a significant risk factor for a poor prognosis in papillary thyroid cancer patients,2–5 and that a neck dissection improves their prognosis.1,4,6,7 Our standard surgical approach to papillary carcinoma is a subtotal thyroidectomy with a modified radical neck dissection (MRND) of the affected side. We usually perform a bilateral MRND in patients with gross bilateral cervical node metastasis and occasionally in patients with a large tumor extending over the isthmus or with multiple tumors in both lobes. It is still difficult, however, to decide whether or not a bilateral MRND should be performed in patients without bilateral gross nodal metastasis. A few reports have addressed the indications for bilateral MRND,8,9 but no studies have investigated the effect of bilateral MRND on the outcome of patients with papillary thyroid cancer.

We previously reported a poor prognosis in patients with papillary thyroid cancer who showed contralateral nodal recurrence after initial surgical treatment consisting of thyroidectomy and ipsilateral MRND with a curative intent.10 Our reported risk factors for contralateral nodal recurrence were male sex, large primary tumor, tumor extended over the isthmus, extracapsular adhesion/invasion, and gross nodal metastasis at initial surgery. To avoid secondary operations and to improve prognosis, we considered patients with high risk for contralateral nodal recurrence after ipsilateral MRND as candidates for bilateral MRND. The question arises whether bilateral MRND actually improves the prognosis of patients at high risk for contralateral nodal recurrence. We investigated the effect of bilateral MRND by retrospectively comparing the cases of patients treated with thyroidectomy and bilateral MRND at initial surgery who had nodal metastasis in the contralateral cervix with those of patients who had undergone thyroidectomy with ipsilateral MRND and later suffered contralateral nodal recurrence.
Patients and Methods

Between 1970 and 1995, 4466 patients with papillary thyroid cancer were treated surgically at the Noguchi Thyroid Clinic and Hospital Foundation, Oita, Japan. Of these, 2069 who had primary tumors greater than 10 mm in maximum diameter and without distant metastasis at initial surgery, underwent thyroidectomy and MRND with a curative intent. Ninety-one of these patients underwent bilateral MRND, 86 of whom had histopathologic nodal metastasis in the contralateral cervix (group 1). Eighty-three group 1 patients showed bilateral nodal metastases. Group 1 included 13 patients with nodal recurrence and 2 with local recurrence. Ipsilateral MRND was performed in 1978 patients, 32 of whom suffered contralateral nodal recurrence (group 2). To eliminate the effect of local recurrence or nodal recurrence on the dissected side (ipsilateral side), the exclusion criteria for group 2 consisted of: local recurrence, nodal recurrence on the ipsilateral side, nodal recurrence discovered within 6 months after initial surgery, and insufficient records. In other words, group 2 did include patients who could have had subclinical nodal metastasis on the contralateral cervical side at the time of initial surgery. We compared the surgical procedures, clinical and pathological characteristics of primary tumor and lymph nodes, cancer stage, and the survival rate between these two groups. Thyroid cancer staging was done according to the TNM classification of the Union International Contra la Cancrum with a slight modification. Because the TNM classification is affected by imaging modalities, it was difficult to apply this system directly to all patients treated during the long study period in which differing modalities were used. We modified the classification system as follows: the tumor size was measured based on histopathological specimens, tumor extension beyond the thyroid capsule was considered positive when adhesion or invasion was found during surgery, and regional lymph node metastasis was considered to be positive when gross nodal metastasis was evident during surgery. Although the staging system used in this study is not precisely the same as the original TNM staging, we believe it is still possible to compare the survival rates of the two groups.

Information about patients still living was obtained by periodic correspondence with the patients, family members, or referring physicians, or, from municipal records. For deceased patients, the cause of death was confirmed by death certificate, contact with family members, or hospital records. The mean follow-up period for patients last known to be alive was 12.8 years (range 0.4–27.1); 14 patients died of thyroid cancer, and 7 died of unrelated causes.

Cause-specific survival rates were calculated with the Kaplan-Meier method using the day of initial surgery as the starting point. A univariate analysis was performed with SAS JMP ver. 3.1R software (SAS Institute, Cary, NC, USA). ) < 0.05 was considered to be statistically significant.

Results

A total thyroidectomy was performed significantly more frequently in group 1 than group 2 (Table 1). Regarding the possible complications for MRND, such as accessory nerve injury, Horner syndrome, or chylorhea, only one complication occurred, a transient chylorhea in a group 1 patients.

The surgical findings and stages were investigated for each group (Table 2). No significant differences occurred in age or sex distributions between the groups. Group 2 tumors were larger than group 1 tumors ( ) < 0.001), but tumors extended over the isthmus or were disseminated throughout the thyroid gland significantly more often ( ) < 0.001 for each) in group 1 than group 2. Adhesion/invasion of the primary tumor to the surrounding tissue and gross nodal metastasis were observed in most patients from both groups. More histopathologically proven lymph node metastases were found in group 1 than group 2. There was no significant difference between the two groups regarding the ratio of patients in cancer stage. The patient criteria in this study excluded those classified as having T1 (diameter ≤ 1 cm) or M1 (distant metastasis).

The overall 10-year survival rate was significantly lower in group 2 than in group 1 (Table 3). No significant difference was found between the two groups regarding the survival rate of patients at stage I (Fig. 1). For stage III patients, group 2 showed a significantly lower survival rate than group 1 (Fig. 2).

Patients developed distant metastasis more frequently in group 2 than in group 1 ( ) < 0.002), thus resulting in a significantly higher cancer death rate ( ) < 0.003, Table 4). Four of six group 1 patients with distant metastasis had lung metastasis, and two had bone metastases. In group 2, all ten patients had lung metastases only.

Table 1. Procedures during the initial surgery

<table>
<thead>
<tr>
<th>Surgical procedure</th>
<th>Group 1</th>
<th>Group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total thyroidectomy</td>
<td>25 (29.1)</td>
<td>1 (3.1)</td>
</tr>
<tr>
<td>Subtotal thyroidectomy</td>
<td>54 (62.8)</td>
<td>22 (68.8)</td>
</tr>
<tr>
<td>Lobectomy with or without isthmetomy</td>
<td>7 (8.1)</td>
<td>9 (28.1)</td>
</tr>
<tr>
<td>Total</td>
<td>86</td>
<td>32</td>
</tr>
</tbody>
</table>

The data indicate the number (percentage) of patients. There were significant differences in the surgical procedures between group 1 and group 2 ( ) < 0.001)