Correlation of Bethesda System for Reporting Thyroid Cytopathology and BRAF V600E Gene Mutation in Patients with Thyroid Papillary Carcinoma

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Materials and Methods

This study included 38 patients who underwent a total thyroidectomy between 2010 and 2019 in our tertiary center.

All of the patients in the study were diagnosed as PTC after histopathologic examination of thyroidectomy specimens.

Nine-teen of these patients had BRAF V600E gene mutation (Group 1), and the other half had not BRAF V600E mutation (Group 2) to compare each group.

All of the patient’s preoperative TBSRTC results and postoperative histopathologic examination, and also BRAF V600E gene mutations of the thyroid specimen results were noted in our study.

Results

• There was only one patient with Bethesda IV (B-IV) in Group 1. Nine of Group 1 patients had FNAB result of B-V and the other remaining 9 patients were B-VI. However, there was no patient with a result of BI, BII and BIII (Figure 1).

• The distribution of preoperative FNAB results of Bethesda in Group 2 patients as follows; one patient with B-III, 7 patients with B-IV, 6 patients with B-V and 2 patients with B-VI.

• Moreover, it was detected 3 patients with Bethesda II (B-II; false negative) in group 2.

• Bethesda V and VI are more closely related with malignancy that make a thyroid operation essential. The rate was 94.7 % (18/19) for Group 1 patients, and was 42.1 % (8/19) for Group 2 patients (Table 2).

• There was no patient with a FNAB result of B-i in both of the groups.

Conclusion

• In conclusion, we detected a strong positive correlation between preoperative TBSRTC results and postoperative correct PTC results in patients with BRAF V600E gene mutation in this study.

• However, this correlation did not exist in PTC patients without this gene mutation.

• These findings suggest that preoperative TBSRTC have more correct results, an valuable in BRAF V600E mutated PTC patients compared to non-mutated PTC patients.

• In addition, these findings need prospective studies with large samples to verify.

Table 1: The risk of malignancy rate of Bethesda classification FNAB results.

<table>
<thead>
<tr>
<th>Bethesda</th>
<th>Malignancy Risk (%)</th>
<th>Indecise (%)</th>
<th>Recommended Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Diagnostic (BI)</td>
<td>1-4</td>
<td>10-30</td>
<td>Repeat/Follow-up</td>
</tr>
<tr>
<td>Benign (BI)</td>
<td>&lt;1</td>
<td>60-70</td>
<td>Follow-up</td>
</tr>
<tr>
<td>AUS/FLUS (BI)</td>
<td>5-10</td>
<td>3-18</td>
<td>Repeat FNAB</td>
</tr>
<tr>
<td>Suspicious for FN (BIV)</td>
<td>15-30</td>
<td>10</td>
<td>Lobectomy</td>
</tr>
<tr>
<td>Suspicious for Malignancy (BVI)</td>
<td>60-75</td>
<td>3-5</td>
<td>Lobectomy/Total Thyroidectomy</td>
</tr>
<tr>
<td>Malignant(BVI)</td>
<td>97-99</td>
<td>3-5</td>
<td>Total Thyroidectomy</td>
</tr>
</tbody>
</table>

AUS: Atypia of undetermined significance, FLUS: Follicular lesion of undetermined significance, FN: Follicular neoplasia

Figure 1: The distribution of the patients according to Bethesda Classification.

Table 2: The percentage of patients according to Bethesda Classification.