INTRODUCTION

Lymphatic metastases (including micrometastases) to the lateral neck may be present in up to 30-80% of patients with well-differentiated thyroid cancer (WDTC).1-2. Both sets of commonly accepted management guidelines recommend preoperative neck ultrasound (US) prior to thyroidectomy.3-4. Historically, comprehensive lateral neck dissection levels II-V was recommended for all patients with WDTC with lateral neck disease.5-6. Currently, the extent of neck dissection for WDTC is controversial.7-8. The aim of our study is to determine if we can safely restrict the extent of neck dissection based upon findings of the preoperative neck ultrasound.

RESULTS

438 patients with WDTC were treated at our institution during this time period. 45 patients met inclusion criteria. Levels II-IV were dissected in 38 patients, level V was included in 23 patients, 2 patients had a comprehensive modified radical neck dissection, 5 patients had a selective neck dissection, and level VI was dissected in 35 patients. 6 patients had bilateral neck dissections. 32 patients had pathology consistent with classical papillary thyroid cancer, five were tall cell variants, four were follicular variants, two had an oncocytic variant, one was a diffuse sclerosing variant, and one had pathology negative for metastatic disease.

232 total nodal levels were dissected. Table 1 demonstrates number of patients with pathologic lymph node metastases by level. Table 2 demonstrates sensitivity, specificity, PPV, NPV, and diagnostic accuracy (each side of the neck was analyzed separately).

Overall diagnostic accuracy (levels II-V) was 46.7%. Diagnostic accuracy of Level II-IV grouped was 53.3%.

PPV in the lateral neck (levels II-IV) was 80.4%. Percentage of diagnostically-accurate ultrasounds improved (non-significantly) over time. Accuracy in levels II-IV for 2006-2008 was 33%, vs. 60% from 2009-2011.

Other variables such as duration of time between ultrasound and surgery, previous thyroidectomy, and previous neck dissection did not affect diagnostic accuracy.

7/45 patients had recurrent disease within the study period (15.5%). All recurrences were located within the previously dissected nodal space or in the contralateral neck.

Median follow-up was 771 days.

DISCUSSION

The extent of lateral neck dissection for patients with WDTC is controversial, and no consensus has been reached.

A recent “best practice” guideline suggests routine dissection of levels II-V, and sparing levels Ila and Vb unless disease is present.7-8.

Nodal disease has been shown to effect locoregional recurrence, but not overall survival.9-10.

The location of metastatic disease by neck level in our study is comparable to the published literature.11-12.

Reliability of US in detecting lymphatic metastases is similar to the published literature.13-14.

Diagnostic accuracy by lateral neck level is high, ranging from 74%-92%. There is a high likelihood that macroscopic metastases will be correctly identified.

Prophylactic comprehensive neck dissection did not protect against recurrence. All recurrences in our sample were located in previously-dissected nodal levels or in the contralateral neck.

We acknowledge limitations including small sample size, and the arbitrary manner by which pathologic specimens were divided into nodal levels. Additionally, ultrasound is unable to detect microscopic disease.

CONCLUSIONS

It is reasonable that surgeons may limit selective neck dissection for WDTC to nodal basins with sonographic evidence of disease.

REFERENCES

3. Cooper DS et al. Management guidelines for patients with thyroid nodules and differentiated thyroid cancer. Thyroid 2006;16(15):1095-142.
12. Figure 1- Transverse ultrasonogram demonstrating AP/Transverse ratio <0.5.
13. Figure 2- Transverse ultrasonogram demonstrating abnormal internal hyper-echoic texture.
14. Figure 3- Transverse ultrasonogram demonstrating abnormal blood flow pattern.

Table 1 - Patients with Pathologic Lymph Nodes by Level

<table>
<thead>
<tr>
<th>Level</th>
<th>n (Patients)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>1</td>
<td>2.1%</td>
</tr>
<tr>
<td>II</td>
<td>30</td>
<td>65.2%</td>
</tr>
<tr>
<td>III</td>
<td>37</td>
<td>75.5%</td>
</tr>
<tr>
<td>IV</td>
<td>32</td>
<td>65.3%</td>
</tr>
<tr>
<td>V</td>
<td>6</td>
<td>26.1%</td>
</tr>
<tr>
<td>VI</td>
<td>45</td>
<td>72.6%</td>
</tr>
</tbody>
</table>

Table 2 – Analysis by Level*

<table>
<thead>
<tr>
<th>Nodal level</th>
<th>n (Patients)</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>PPV</th>
<th>NPV</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>3</td>
<td>0.0%</td>
<td>50.0%</td>
<td>0.0%</td>
<td>50.0%</td>
<td>66.7%</td>
</tr>
<tr>
<td>II</td>
<td>46</td>
<td>63.3%</td>
<td>68.8%</td>
<td>79.2%</td>
<td>50.0%</td>
<td>76.1%</td>
</tr>
<tr>
<td>III</td>
<td>49</td>
<td>75.7%</td>
<td>50.0%</td>
<td>82.4%</td>
<td>40.0%</td>
<td>81.6%</td>
</tr>
<tr>
<td>IV</td>
<td>49</td>
<td>84.4%</td>
<td>58.8%</td>
<td>79.4%</td>
<td>66.7%</td>
<td>91.8%</td>
</tr>
<tr>
<td>V</td>
<td>23</td>
<td>0.0%</td>
<td>94.1%</td>
<td>0.0%</td>
<td>72.7%</td>
<td>73.9%</td>
</tr>
<tr>
<td>VI</td>
<td>62</td>
<td>57.8%</td>
<td>82.4%</td>
<td>89.7%</td>
<td>42.4%</td>
<td>69.4%</td>
</tr>
</tbody>
</table>

*Each side of the neck was analyzed independently.

Conclusion: The current study suggests that it is feasible to restrict the scope of selective neck dissection for WDTC based upon the findings of ultrasound lymphatic mapping. High positive predictive value indicates that if suspicious nodes are seen, they should be targeted. Undergoing comprehensive neck dissection did not protect against recurrence.