Evaluating the Utility of Thyroglobulin Wash Testing in the Management of Well-Differentiated Thyroid Carcinoma

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INTRODUCTION

- Thyroid cancer is the most common endocrine neoplasm worldwide, representing 1.7% of new cancer diagnoses and 0.5% of cancer deaths each year (Baldini et al.)
- The majority of thyroid cancers are primary (originating within the gland itself), are well-differentiated, and are derived from follicular epithelial cells
- **Papillary thyroid cancer** is the most common subtype
  - 70-80% of all thyroid cancers
  - Peak incidence in women of child-bearing age
  - Generally indolent behavior, excellent prognosis with total thyroidectomy
  - 30-90% of patients exhibit recurrent or persistent metastasis to the cervical lymph nodes (Torres et al.) and 20% of cases present with occult cancer that is only identifiable in the nodes without evidence of a primary tumor (Cunha et al.)
  - It is important to detect local lymph node involvement in order to determine appropriate surgical management, clinical follow-up, and prognosis (Baldini et al.)
- **Evaluation for lymph node involvement**
  - Gold standard: fine needle aspiration + cytology (FNAC)
  - Diagnostic pitfalls:
    - Cystic change – very common in head and neck cancers, especially papillary thyroid cancer (Ustun et al.)
    - Micrometastases
  - Thyroglobulin wash testing (TgW)
    - Syringe used for FNAC flushed with normal saline
    - Tg level in washout fluid measured using chemiluminescent assay
    - Adding TgW to FNAC increases sensitivity and specificity to nearly 100% (Suh et al.)

OBJECTIVE:

To determine how thyroglobulin wash testing contributed to the management of thyroid cancer patients with positive/suspicious and negative/non-diagnostic cytology.

METHODS

- All recent cases of thyroid bed and lymph node FNAC with simultaneous TgW testing in the Cytology Department of TJUH were retrospectively reviewed (N= 104)
- The cytological diagnosis was confirmed and compared with the TgW test results; cases with surgical follow-up and histological diagnosis were identified and also reviewed
- The selected cases were divided in two groups depending on cytological diagnosis: positive/suspicious group and negative/ non-diagnostic group

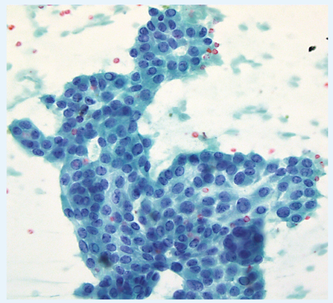

Figure 1: FNAC sample from papillary thyroid cancer spread to cervical lymph node.

RESULTS

Table 1: Results of thyroglobulin wash testing

	Thyroglobulin Level	
	Elevated (>1 ng/mL)	**Negative (<1 ng/mL)**
Positive or suspicious FNAC (N=30)	22 (73%)	8 (27%)
Negative or non-diagnostic FNAC (N=74)	4 (5%)	70 (95%)

Table 1: Over 70% of the cases reviewed were either negative or non-diagnostic on FNAC. Of these cases, a small percentage had elevated thyroglobulin levels upon wash testing.

RESULTS

Table 2: Diagnostic outcomes on follow-up for samples with discordant TgW/FNAC results

	TC positive	TC negative
Positive or suspicious FNAC + negative TG washout	7	1
Negative or non-diagnostic FNAC + positive TG washout	1 (3 only clinical follow-up)	0

Table 2: All 4 of the cases reviewed with negative/non-diagnostic FNAC and elevated TgW were positive for thyroid carcinoma on surgical or clinical follow-up.

CONCLUSIONS

- Diagnosing lymph node involvement in well-differentiated thyroid cancer by FNAC alone can be challenging and yield non-diagnostic specimens
- Measurement of thyroglobulin levels is important for the diagnosis and management of metastatic or recurrent thyroid carcinoma in patients with negative/non-diagnostic FNAC
- Patients with positive or suspicious findings on FNAC generally undergo neck dissection regardless of TgW test results
- Our data supports the recommendation that reflex TgW testing be reserved for cases with negative or non-diagnostic cytology as a cost-effective and time-saving measure

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