

Audit: RE-AUDIT OF THYROID FNA USING THE THY GRADING SYSTEM AND HISTOLOGY AT SUNDERLAND ROYAL HOSPITAL, 2011

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BACKGROUND

This is a repeat audit examining the recommendations of the previous SRH Thyroid FNA Audit, performed in 2010, which examined the accuracy of Thyroid FNA in predicting histological outcome, and the use of the Thy grading system. Following the previous audit, the following recommendations were made:-

1. Cases with low cellularity should be interpreted with caution; criteria for adequacy should be clearly defined, and the limitations of sampling should be understood by clinicians.
2. Multiple samples taken from one patient should be clearly identified by clinical & laboratory staff at all stages of handling, receipt, processing & reporting.
3. The selection of thyroid cases for pathologist & MDT review should not be solely dependent on Thy grading; the descriptive report should be considered, as well as clinical & radiological features.
4. The Thy grading system is best utilised in conjunction with a descriptive report, along with clinical and radiological information, to plan management for patients.

AIM & OBJECTIVES

This was a re-audit of Thyroid Fine Needle Aspirates (FNAs), carried out to examine the accuracy of Thyroid FNA in predicting histological outcome, and to examine the use of the Thy grading system when applied to specimens at Sunderland Royal Hospital (SRH). We also looked at whether the audit recommendations from 2010 had been followed.

STANDARDS

In this audit, histology is the 'gold standard' against which the cytology reports are being compared. The RCPATH guidance states that published data on thyroid FNA cytology shows sensitivity for malignancy between 65% and 98%, specificity of 76-100%, with a false negative rate of 0-5%, a false positive rate of 0.5-7%, and an overall accuracy of 69-97%.

METHODS

The audit was performed on cases where a surgical specimen was taken between 1.01.11 and 31.12.11. The corresponding cytology FNA reports were reviewed. All pathologists were encouraged to use the Thy grading system as recommended by the Royal College of Pathologists. In this audit, cases with descriptive reports and no Thy category were assigned "Thy U". These reports were subsequently reviewed and given a Thy grading based on the original pathologist's descriptive report. Thy grading was compared with the subsequent histological diagnosis, and FNAs were reviewed where these appeared discrepant.

RESULTS

There were 81 thyroid surgical cases sent to the Histopathology Department at Sunderland Royal Hospital between 1.01.11 and 31.12.11, 17 of which were not known to have previous FNA. During the same period, there were 214 Thyroid FNAs received, 59 of which preceded surgical excision, 40 at Sunderland Royal Hospital, and 19 performed elsewhere, 17 of which had been referred for review by the Thyroid lead pathologist.

Of the 40 FNA cases reported at Sunderland that were followed by surgical excision, 6 were not initially given a Thy category, but on review were graded as follows: Thy2 (3), Thy3f (1), Thy1 (1) and Thy5 (1). In cases with multiple specimens, these were clearly separately identified in all reports. **Figure 1** summarises the FNA results by category.

Twenty six of the SRH FNA cases which went onto to surgical excision were discussed at the MDT, including all cancer cases. Twenty three of the 40 SRH surgical cases were discussed at the MDT.

Figure 1: FNA results by Thy category

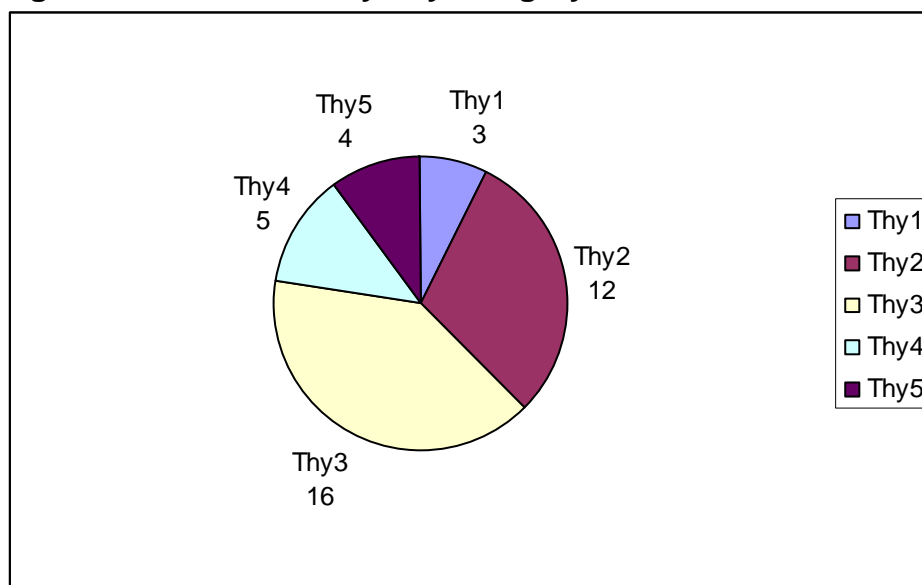


Table 1 compares histological outcome to Thy category. On review of cytology and histology reports, 3 of the 40 cases appeared to be discrepant (highlighted in red), the slides of which were reviewed by the auditors (LW &DM). The review of each case is described below.

Table 1: Histological outcome and FNA Thy Grade

Cytology Grade	Histology result
Thy1, n=3	Follicular adenoma (1) Granulomatous thyroiditis (1) Dominant nodule in MNG vs Follicular adenoma.
Thy2, n=12	Dominant nodule in multinodular goitre (3) Multinodular goitre (5) Cystic change in a multinodular goitre (Thy2c) (2) Follicular adenoma (2)
Thy3, Thy3f n=15 Thy3a n=1	Multinodular goitre (2) Multinodular goitre with lymphocytic thyroiditis (1) Dominant nodule in multinodular goitre (4 inc.Thy3a) Follicular adenoma (6) Follicular carcinoma (1) Papillary carcinoma (1) Follicular variant of papillary carcinoma (1)
Thy4, n=5	Multinodular goitre (1) Papillary carcinoma (4)
Thy5, n=4	Papillary carcinoma (3) Metastatic squamous cell carcinoma (1)

Case T1

ORIGINAL REPORT – Thy4; HISTOLOGY – MULTINODULAR GOITRE

REVIEW: The FNA contains blood, thin colloid and numerous cyst-type macrophages. Groups of crowded thyroid follicle epithelial cells are present showing nuclear enlargement, overlap and smudge artefact. These features are best regarded as suspicious and atypical. **COMMENT - Thy3-4. Agree with previous report.**

MDT Discussion: 9/3/11 (reported 18/2/11)

Case T2

ORIGINAL REPORT Thy3f; HISTOLOGY – FOLLICULAR VARIANT PAPILLARY CARCINOMA

REVIEW: This FNA shows high cellularity and contains numerous thyroid follicular epithelial cells forming microbiopsies and flat sheets. Occasional

groups show nuclear crowding and intranuclear grooves. There is a background of macrophages and occasional multinucleate giant cells.

COMMENT - Thy3. Agree with previous report.

MDT Discussion: 12/10/11 (reported 3/10/11)

Case T3

ORIGINAL REPORT Thy3f; HISTOLOGY-PAPILLARY CARCINOMA

REVIEW: This highly cellular specimen contains large number of thyroid epithelial cells arranged in flat, crowded sheets and papillary groups. Some groups show Hurtle cell change. Cells possess a moderate amount of cytoplasm and show atypical enlarged nuclei. Intranuclear vacuoles, grooves, multinucleated giant cells and viscid colloid are seen. The appearances are suspicious for papillary carcinoma of the thyroid. **COMMENT - Thy4.**

UPGRADED from Thy3.

MDT Discussion: 25/5/11 (reported 20/5/11)

Referred Cases

In 19 cases FNA was performed at another hospital prior to surgery at Sunderland, 17 of which were first reviewed at the Thyroid MDT. In the remaining 2 cases, there was no mention of the FNA result nor any FNA review.

Table 2. Referred Thyroid FNAs	
Thy	Ungraded 1
Thy 1	0
Thy 2	2
Thy 3	13(Thy3=1;3a=4;Thy3f;8)
Thy 4	1
Thy 5	0

These cytology cases were not available for review. However, in 1 referred case reported as Thy4, the subsequent SRH histology showed treated thyrotoxicosis with lymphocytic thyroiditis and extensive Hurtle cell change.

COMPARISON OF CASES IN 2010 AND 2011 THYROID FNA AUDITS

Table 3 compares the previous audits from 2010 and 2011:

	2010	2011
Thyroid FNAs	151	214
Histology Cases	89	81
FNA and histology discrepancy	5	3

DISCUSSION

This re-audit has examined the accuracy of thyroid FNA reports when assessed against subsequent histology, and assessed whether the previous 2010 audit recommendations were implemented. Three cases showed a discrepancy between FNA cytology and subsequent histological diagnosis, compared to five cases in the previous year. These cases were diagnostically challenging, and in only one was the Thy grading changed, from Thy3f to Thy 4. The diagnostic difficulty arose from a papillary carcinoma with features mimicking a Hurtle cell lesion. A different case, categorised as Thy3f, in which histology was a follicular variant of papillary carcinoma, was not re-graded on review. These cases illustrate the difficulty in obtaining accurate diagnoses due to overlapping cytological features by different benign and malignant pathologies.

Six cases that were not initially Thy graded were all reported by different pathologists. These cases showed no discrepancy with subsequent histology.

The previous audit highlighted the need to ensure that multiple samples that are sent as one specimen request should be clearly identified and documented. As a result of the 2010 audit, the laboratory protocol for cytology specimen receipt and handling was revised. In the 2011 audit all multiple samples were clearly identified, indicating that protocol had been followed.

The 2010 audit identified a small number of cases classified as Thy1 or 2, which were samples with low cellularity that were subsequently shown to be malignant. It was recommended that cases with low cellularity should be interpreted with caution, with the need for the pathologist to look carefully for atypical cells. In the 2011 audit no Thy1 or Thy2 cases were shown to be malignant, suggesting that this recommendation was heeded.

CONCLUSIONS AND RECOMMENDATIONS

1. The recommendations of the 2010 Thyroid FNA Audit were implemented successfully, in particular with a much higher proportion of cases given a Thy category. **Pathologists should ensure that all thyroid FNAs are given a Thy grading in addition to a descriptive report.**
2. The audit showed that reporting of FNAs was generally of a high standard, and was accurate and with few discrepancies. All diagnostically challenging cases were discussed at the Thyroid MDT, facilitating optimal clinical management.

References

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