

# Implementing a “One Stop” Consultant Led Ultrasound and Fine Needle Aspiration Service for Thyroid Lumps

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Received date: 29 Dec 2016; Accepted date: 08 Feb 2017; Published date: 15 Feb 2017.

Citation: Rocke J, Pothula V, Ranganathan B, Kumar N (2017) Implementing a “One Stop” Consultant Led Ultrasound and Fine Needle Aspiration Service for Thyroid Lumps. *J Surg Open Access* 3(2): doi <http://dx.doi.org/10.16966/2470-0991.142>

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## Abstract

The British Thyroid Association has recently aimed to clarify the management of thyroid lumps. They released guidelines, in 2014, recommending Ultrasound (US) examination in all thyroid lesions and Fine Needle Aspiration Cytology (FNAC) if positive findings are localised. Grading systems for both US and FNA were introduced allowing the clinician to compare these results with clinical findings and determine the most appropriate next step. The current target is 62 days for potential malignant disease from urgent referral to the first definitive treatment.

We implemented a “One-Stop” Consultant led US and FNAC service for patients presenting with thyroid lesions to streamline our service and ensure this target is reached. Following this introduction we significantly increased the quality of USS grading and the number of successful FNAC investigations.

**Keywords:** Led ultrasound; Fine needle aspiration; Thyroid lumps

## Introduction

Fine Needle Aspiration Cytology (FNAC) allows risk stratification of thyroid nodules according to cytological appearances. The British Association of Endocrine and Thyroid Surgeons (BAETS) 4<sup>th</sup> National Audit on Thyroid and Endocrine Surgery (2012) recommended the use of a Thy Classification for cytological staging [1]. Recent British Thyroid Association (BTA) guidelines (2014) on the management of thyroid cancer introduced an US classification based on characteristic features of thyroid nodules (Figure 1) which aimed to help clinician's grade thyroid lesions radiologically [1]. Ultrasound helps differentiate benign from malignant nodules and guides FNAC of suspicious nodules.

The U Classification sets out a clear guide for radiologists and ultrasonographers to follow. It allows the classification and staging of a large variety of thyroid lesions and pathology in to five groups ranging from U1 (normal) to U5 (malignant). This combined with FNAC staging will shape the outpatient based investigation of thyroid lumps and the extrapolation of their malignant potential.

While this guidance produced a welcome standardised framework for clinicians it also posed a challenge for service provision. The guidance increased the workload for Ultrasonographers and Cytologists as all thyroid lesions now require FNAC. By adding extra diagnostic steps this also increased the challenge to formulate a management plan within the 62 day waiting time target recommended by National Health Service England [2].

Similar challenges have been faced in other specialities. Breast surgery is perhaps the most familiar example where triple assessment of a breast lump is taught at both undergraduate and postgraduate level. Its success at coalescing clinicians in different specialities to operate one clinic directed at clinical, radiographic and cytological staging in a single patient visit has been widely recognised and adopted across centres internationally as standard practice.

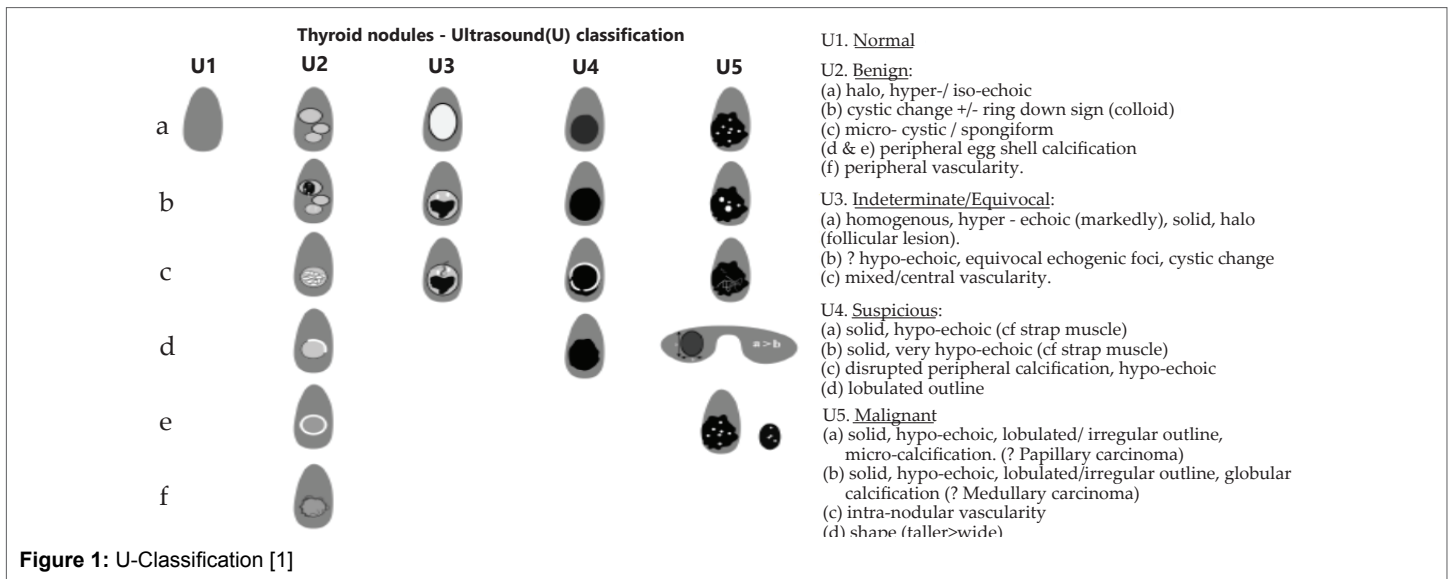
Despite the guidelines from the British Thyroid Association being introduced over two years ago there have been no published examples of Otolaryngologists replicating the success of our colleagues in other specialities who run multifaceted clinics. Where larger specialist units, at teaching hospitals, have a larger population base and therefore a greater number of patients with Thyroid lesions presenting to their clinics, a more economically viable scenario for a one-stop clinic is created. At smaller centres it is often more difficult to find the resources needed to implement “standard” practice once it has been released by the associations and societies.

To streamline services, in our District General Hospital, we implemented a Consultant led “one-stop” clinic for Thyroid lesions in an attempt to pair our Ultrasound and FNAC facilities to create more accurate results. While guidance recommends Ultrasound and FNAC for all thyroid lesions it does not suggest how this should be implemented in the clinical environment. In all of the BTA guidance's 136 pages there is no mention of a “one-stop” clinic.

While the one-stop clinic for thyroid lesions is now regarded as a gold-standard for clinical practice amongst Head and Neck specialists there is only one published example that has assessed its feasibility and efficiency and no studies within the United Kingdom or in smaller units [3]. This study aims to provide our experience in implementation of a one-stop patient journey for patients presenting with thyroid lesions.

## Method

Our hospital trust Wrightington, Wigan and Leigh, is made up of several district general hospitals and satellite clinic areas. The head and neck service is largely run by one Consultant ENT surgeon in a clinic supported by trainees. Before the implementation of the new clinic FNAC was undertaken by these clinicians exclusively who also assessed their adequacy. Patients were then referred for an USS scan and subsequently reviewed in clinic.



In our new clinic patients with thyroid lesions are assessed by the Ear, Nose and Throat (ENT) clinician and then are referred to a Consultant Radiologist, who undertakes FNAC. A technician is then employed to assess for cytological adequacy and a repeat can be undertaken immediately if a sample is deemed insufficient. The lump is graded using ultrasound by the Consultant radiologist immediately. Cytological specimens are sent from the clinic to a Cytologist as at present there is no personnel available to attend within the clinic setting. This means that our patients usually require a follow up appointment if FNAC is undertaken.

Data was collected from our clinical records and electronic reporting databases. We searched for data specifically relating to the clinician performing FNAC, the dates of initial consultation, FNAC and the date of diagnosis for the calendar year of 2015; during which the one-stop clinic was implemented (August).

This provided 103 patients who had attended our Head and Neck clinic and undergone FNAC. For the purpose of this investigation we specifically analysed FNAC targeted at thyroid lesions which meant 76 patients were excluded from analysis at this stage. This left 27 patients who had undergone thyroid FNAC; 16 before implementation and 11 post implementation of the one-stop clinic set up.

We used simple analysis software (Microsoft Excel and Graph Pad Prism) to compare results before and after the clinic implementation date. By recruiting a specialist radiologist to perform FNAC in the clinic, rather than an ENT clinician who sporadically performs this technique, we hypothesised that they would be able to target suspicious lesions more appropriately and accurately.

We first assessed if the rate the USS images were staged pre and post clinic implementation date according the BTA guidelines U classification. We then assessed if the adequacy rate of the FNAC samples changed. Finally the time taken for diagnosis and the number of clinic visits required was investigated for significant change.

## Results

The mean age of patients examined before the one-stop set up was 61 years compared to 57 years in the after one-stop set up, 75% of patients were female and 25% male pre-implementation with 91% female and 9% male following.

In the first group of patients, before the new clinic set up, all but one of the patients underwent USS examination at some point following the

initial consultation but 5 patients who underwent USS were not staged using the BTA U classification.

The staging rates are outlined in table 1. We compared results, pre and post clinic introduction, using a Chi-Squared test (p=0.02). Similarly prior to implementation of the One-Stop clinic just 44% of the initial thyroid FNAC were adequate for analysis. Following the introduction of the new service diagnostic yield increased to 100%. We again compared these results using a Chi-Squared test (p=0.002) and the results are outlined in table 2.

The time taken for diagnosis and management plan formulation was then assessed. This was the time taken from initial consultation in clinic to the final consultation in clinic where the results were communicated to the patient and a management plan formulated. The average time taken before the new clinic introduction date was 34 days and 28 days post but there was no statistically significant difference demonstrated using a t-test. The number of clinic visits also decreased from 3 to 2.2 but again this was not statistically significant reduction.

## Discussion and Conclusion

Introducing this clinic provided numerous advantages; a specialist service utilising the U classification has resulted in improvement in the targeting of thyroid lesions and unsurprisingly as a result increased our clinical accuracy and slickened the patient's journey. The BTA guidance

	Staged	Not staged	Marginal Row Totals
<b>Pre-Clinic</b>	10	6	16
<b>Post-Clinic</b>	11	0	11
<b>Marginal Column Totals</b>	21	6	27

**Table 1: USS Staging using U classification pre and post new clinic implementation date**

	Adequate	Inadequate	Marginal Row Totals
<b>Pre-Clinic</b>	7	9	16
<b>Post-Clinic</b>	11	0	11
<b>Marginal Column Totals</b>	18	9	27

**Table 2: Adequacy of FNAC before and after new clinic implementation date**

does not suggest how to implement both USS and FNAC staging. Until now there has been just one published example of a one-stop Thyroid clinic being utilised and none within the United Kingdom despite it being widely regarded as “standard” practice amongst the Head and Neck community internationally. This paper demonstrates that the guidance can be implemented successfully using this set up within a District General Hospital setting.

Prior to its implementation FNAC would be performed freehand by a Consultant ENT surgeon without the use of directed ultrasound; meaning lesions would not be radiologically targeted. Mehrotra et al. [4] have already demonstrated increased accuracy and yield of USS FNAC compared to the freehand technique when targeting thyroid lesions [4]. By grading the lesions using USS the radiologist is also able to identify suspicious lesions immediately and as such direct FNAC more appropriately.

Introducing this radiologist not only increased the successful grading of lesions but also increased the diagnostic yield of our FNAC as a result significantly reduced the number of inadequate samples. This subsequently reduces the need for repeat FNAC ultimately reducing discomfort and potential morbidity for our patients.

We have demonstrated that this clinic also has the potential to reduce the time taken for a diagnosis to be made as a result of a more streamlined and productive approach. If this study was undertaken on a larger study power we believe it would reach sufficient statistical power to show a significant difference. Previous studies on similar clinic arrangements have shown a reduction in health budget expenditure as a result of this increased efficiency despite the cost of extra consultant sessions although this was not assessed in our investigation [5].

Ideally we would have a Cytologist present at the clinic, to analyse cytological specimens immediately, as this would reduce the patient journey further and increase clinic capacity as a result. However, in today’s NHS, resources are often stretched and we have demonstrated that our service is working sufficiently without an onsite cytologist currently.

Whilst new guidance is often difficult to implement and creates structural challenges we have demonstrated the effectiveness of a “One-Stop” thyroid clinic this framework is simple and readily adaptable for other similar units to implement.

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