

# Management of the thyroid nodule

Gabriele Galatà

Klaus-Martin Schulte

## Abstract

The purpose of this article is to propose a diagnostic and therapeutic approach to the thyroid nodule. The clinical presentation of thyroid nodules is heterogeneous. The task of the surgeon is to classify the nodule, stratify risk, plan and perform surgical treatment and provide appropriate follow-up. Although differentiated thyroid carcinoma has a mostly benign prognosis, follow-up should last a lifetime. Also, pathology can change with time. It is known that a benign thyroid nodule, silent for a long time, can suddenly increase in size and show signs of malignancy.

**Keywords** Management; thyroid adenoma; thyroid cancer; thyroid neoplasm; thyroid nodule

## Incidence

Clinically, palpable thyroid nodules are very frequent. They occur in about 10% of women and 2% of men. This prevalence is increased to around 50%, if high-resolution ultrasonography (US) is used to detect thyroid nodules. This is similar to the prevalence found at autopsy. In addition, between 20% and 48% of patients with a clinically palpable single thyroid nodule have multinodular change on ultrasound. In contrast to the prevalence of thyroid nodules, the annual incidence of thyroid cancer in the UK is reported at only 3.5 per 100,000 women and 1.3 per 100,000 men.

## Aetiology

The pathology underlying thyroid nodules may be classified as benign and malignant (Table 1). The underlying cause of the pathology is often uncertain and can be associated with social or environmental factors such as low intake of iodine and history of ionizing radiation.

## Presentation

The most common presentation of a thyroid nodule is an asymmetric swelling in the neck. Other signs and symptoms may be related to dysfunction of the gland (hyperthyroidism or hypothyroidism), neck discomfort or pain, compressive symptoms (dysphagia, dysphonia or dyspnoea), palpable lymph nodes, and rarely associated with multiple endocrine neoplasia (MEN)

syndromes. Often, the presentation is as an incidental finding on imaging performed for unrelated causes as colour Doppler, MRI or CT scan of the neck and chest.

## Clinical assessment

A good history represents an important part of the clinical assessment. This should be targeted to search for risk factors (Table 2) for thyroid cancer and other useful information that would facilitate management. Special investigations are required in suspected cases of familial disease such as familial medullary thyroid cancer, MEN 2, familial papillary thyroid tumours, familial polyposis coli, Cowden disease and Gardner syndrome. On the other hand, the prevalence of cancer may be lower in nodules within multinodular goitres, and autonomously hyperfunctioning ('hot') nodules. The clinical importance of the thyroid nodule evaluation is primarily related to the need to exclude thyroid hormone excess or thyroid cancer, which is present in 4.0–6.5% of thyroid nodules. Non-palpable nodules (incidentalomas/unexpected finding) have the same risk of malignancy as palpable nodules.

A full physical examination should be performed with particular focus on the neck. On neck examination, the following should be described: location, consistency, size, mobility, relation of the lump to surrounding structures, overlying skin, neck tenderness or pain, cervical lymphadenopathy. Examination should record voices changes and stridor where present.

## Investigations

### Blood tests

Thyroid-stimulating hormone (TSH) levels should be checked to determine the patient's thyroid function.

Guidelines suggest the measurement of free thyroid hormones only in case of an abnormal TSH level and thyroid peroxidase antibodies (TPA) if autoimmune or Hashimoto thyroiditis is suspected. Thyroglobulin measurement is only indicated in the follow-up of patients with differentiated thyroid cancer. Basal plasma calcitonin levels and carcinoembryonic antigen are mandatory for assessing patients with thyroid nodules and a family history of medullary thyroid cancer (MTC) or MEN 2. False-positive elevation in calcitonin can occur in patients with pulmonary or pancreatic endocrine tumours, kidney failure, autoimmune thyroid disease, proton-pump inhibitor therapy, alcohol consumption, smoking, sepsis and heterophilic anti-calcitonin antibodies. RET proto-oncogene sequencing is undertaken to identify germline mutations causing familial MTC (FMTC) and MEN 2 in patients with a positive family history. This is also recommended in all patients with an established diagnosis of MTC as a quarter of these tumours have a hereditary basis.

### Ultrasound (US)

Ultrasound should be performed in patients with thyroid nodules, especially in the presence of risk factors (Table 2). US gives reliable information with good predictive value (Table 3) regarding specific features of the nodules such as position, shape, size, margins, content, echogenicity and vascular pattern and microcalcification.

*Gabriele Galatà MD is a Senior Clinical Fellow in the Department of Endocrine Surgery at King's College Hospital, London, UK. Conflicts of interest: none declared.*

*Klaus-Martin Schulte MD FRCS is a Consultant Surgeon in the Department of Endocrine Surgery at King's College Hospital, London, UK. Conflicts of interest: none declared.*

**Causes of thyroid nodules**

Benign	Malignant
Chronic lymphocytic thyroiditis	Follicular carcinoma
Simple or hemorrhagic cysts	Hurthle cell carcinoma
Follicular adenomas	Poorly differentiated carcinoma
Subacute thyroiditis	Medullary carcinoma
	Anaplastic carcinoma
	Primary thyroid lymphoma
	Sarcoma and other miscellaneous tumours
	Metastatic tumours

**Table 1**

**CT/MRI**

CT/MRI scanning of the neck and chest is indicated in patients with compressive symptoms or suspected retrosternal extension to evaluate the anatomical extent of the goitre and the degree of airway compression. They are also sometimes used to stage patients with suspected/confirmed thyroid cancer and in the differential diagnosis of lumps of uncertain origin. In case of benign symptomatic pathology a simple chest X-ray can provide useful information regarding extension of intrathoracic/retrosternal goitre and tracheal compression and deviation.

The sensitivity of US and CT in detecting lymph node metastases (staging) is poor and this should be kept in mind when planning oncological surgery.

**FNA**

Fine needle aspiration (FNA) has become a central tool in assessment of thyroid nodules. FNA biopsy has resulted in improved diagnostic accuracy, a higher malignancy yield at the time of surgery, reduction in unnecessary surgery and significant cost reductions. It can be performed free-hand in well-palpable lesions, whilst US guidance is helpful in smaller or impalpable lesions or those less accessible due to neighbouring vessels. In patient without risk factors, FNA is recommended for the assessment of all non-toxic solid or hypoechoic nodules larger

**Risk factors for thyroid cancer**

Risk factors	Risk of malignancy
Male gender	2–3 times increased risk
Age	<20 (double risk)/>70 (quadrupled risk)
Ionizing radiation	Increased
Family history	Increased
Larger nodule size (>4 cm)	Increased risk
Recent onset, growing nodule	Increased
Hoarse voice	Increased
Cervical lymphadenopathy	Increased
Firm/hard consistency, fixed nodule	Increased

**Table 2**

than 1 cm whilst in patient with risk factors it is recommended for nodules over 0.5 cm. It should also be employed for lesions smaller than 1 cm in the presence of suspicious US criteria such as extracapsular growth, suspected metastatic cervical lymph nodes, history of neck irradiation in childhood or adolescence, positive family history of thyroid cancer, or cold nodule on scintigraphy. In patients with multiple nodules, any dominant nodules or those with suspicious features on US should be evaluated with FNA biopsy. The nodules that are not biopsied or yield an unsatisfactory aspirate may be monitored with periodic ultrasonography. The outcome of FNA is key in managing thyroid nodules. For standardization purposes and quality control, cytology results are classified on a scale of cancer risk. The classification system used in the UK is shown in Table 4 and the subsequent management based on cytology results is demonstrated in Figure 1.

**Core biopsy**

Most thyroid nodules can be sufficiently assessed without core needle biopsies. If and when such a sufficient assessment has been achieved one should abstain from core needle biopsy as it can cause bleeding and significant pain. International guidelines suggest core needle biopsy in thyroid masses with inadequate repeated FNA, anaplastic cancer, and thyroid lymphoma. There is no indication for the use of core needle biopsies in follicular tumours, as it does not provide additional information.

**Radionuclide scanning**

Thyroid scintigraphy is sometimes used to investigate the function of solitary nodules. According to uptake of the nodule and the remnant thyroid parenchyma they are classified as hyperfunctioning or hot, hypofunctioning or cold and indeterminate or warm. In patients with hyperthyroidism, thyroid scintigraphy may help to identify small thyroid nodules with sometimes excessive function which may have escaped US imaging and are well amenable to radioiodine ablation. In other cases it will help to define Graves' disease, where a diffusely increased uptake is seen. Scintigraphy is also used to search for distant metastasis or ectopic thyroid/residual gland following previous surgery and to identify hot and cold nodules in a toxic multinodular goitre before partial/hemi-thyroidectomy.

**Pathological variants of thyroid neoplasms**

**Benign neoplasms**

**Follicular adenoma:** most epithelial benign tumours of the thyroid (adenomas) are of follicular type. Follicular adenomas can be solitary or frequently occur in the context of a multinodular goitre. Tumours are encapsulated, ovoid and vary in size. The consistency of the swelling varies in relation to secondary changes such as haemorrhage, cystic changes, fibrosis, and calcification which occasionally occur in such lesions. The microscopic appearance of the follicular adenoma is characterized by the presence of numerous colloid containing thyroid follicles. These lesions do not show the vascular or capsular invasion characteristic of follicular thyroid cancer.

**Hurthle cell adenoma:** this adenoma is composed of large cells rich in cytoplasm with a granular appearance due to abundant

Download English Version:

<https://daneshyari.com/en/article/3838415>

Download Persian Version:

<https://daneshyari.com/article/3838415>

[Daneshyari.com](https://daneshyari.com)