

## Solitary thyroid nodule

### Clinically discrete swellings

Discrete thyroid swellings (thyroid nodules) are common and are present in 3—4 per cent of the adult population in the UK and USA. They are three to four times more frequent in women than men.

A discrete swelling in an otherwise impalpable gland is termed **isolated** or **solitary**, whereas the preferred term for a similar swelling in a gland with clinical evidence of generalised abnormality in the form of a palpable contralateral lobe or generalised mild nodularity is **dominant**. *About 70 per cent of discrete thyroid swellings are clinically isolated and about 30 per cent dominant.* The true incidence of isolated swellings is somewhat less than the clinical estimate. Clinical classification is inevitably subjective and overestimates the frequency of truly isolated swellings. When such a gland is exposed at operation or examined by ultrasonography, computed tomography (CT) or magnetic resonance imaging (MRI), clinically impalpable nodules are often detected. Establishing the presence of such minor abnormality is unnecessary because the management of discrete swellings, be they isolated or dominant, is similar.

The importance of discrete swellings lies in the risk of neoplasia compared with other thyroid swellings. Some 15 per cent of isolated swellings prove to be malignant, and an additional 30—40 per cent are follicular adenomas. The remainder are non-neoplastic largely consisting of areas of colloid degeneration, thyroiditis or cysts. Although the incidence of malignancy or follicular adenoma in clinically dominant swellings is approximately half that of truly isolated swellings, it is substantial and cannot be ignored.

The term **thyroid nodule** refers to any abnormal growth of thyroid cells into a lump within the thyroid. Although the vast majority of thyroid nodules are benign (noncancerous), a small proportion of thyroid nodules do contain thyroid cancer. Because of this possibility, the evaluation of a thyroid nodule is aimed at discovering a potential thyroid cancer.

### SYMPTOMS

- ❖ Most thyroid nodules do not cause any symptoms.
- ❖ The doctor usually discovers them during a routine physical examination, or
- ❖ The patient might notice a lump in the neck while looking in a mirror.
- ❖ Symptoms of hyperthyroidism
- ❖ A few patients with thyroid nodules may complain of pain in the neck, jaw, or ear. If the nodule is large enough, it may cause difficulty swallowing or cause a "tickle in the throat" or shortness of breath if it is pressing on the windpipe.
- ❖ Rarely, hoarseness can be caused if the nodule irritates a nerve to the voice box.

### CAUSES

Although thyroid cancer is the most important cause of the thyroid nodule, fortunately it occurs in less than 10% of nodules

This means that about 9 of 10 nodules are benign (noncancerous).

The most common types of noncancerous thyroid nodules are known as **colloid nodules** and **follicular neoplasms**.

If a nodule produces thyroid hormone without regard to the body's need, it is called an **autonomous nodule**, and it can occasionally lead to hyperthyroidism.

If the nodule is filled with fluid or blood, it is called a **thyroid cyst**. We do not know what causes most noncancerous thyroid nodules to form.

A patient with hypothyroidism may also have a thyroid nodule, particularly if the cause is the inflammation known as **Hashimoto's thyroiditis**.

Sometimes a lack of iodine in the diet can cause a thyroid gland to produce nodules.

Some autonomous nodules have a genetic defect that causes them to grow.

### Management

#### **The first step is history**

Starting with the history, details regarding the nodule such as time of onset, change in size & associated symptoms as pain, dysphagia, dyspnoea or choking should be elicited.

Pain is an unusual symptom & when present, should raise the suspicion of intrathyroidal hemorrhage in a benign nodule, thyroiditis or malignancy.

A history of hoarseness is worrisome because it may be secondary to malignancies which involve the recurrent laryngeal nerve.

Also ask about risk factors for malignancy as exposure to ionization & family history of thyroid CA & other malignancies associated with thyroidal cancer. Also take HX regarding toxicity

#### **The second step is physical examination**

Thyroid masses usually move with swallowing & failure to observe the patient swallowing may lead one to Miss Retrosternal goiter.

Nodules that are hard, gritty or fixed to surrounding structures, e.g. trachea or strap muscles are more likely to be malignant.

The ipsilateral & contralateral jugular & posterior triangle lymph nodes should be assessed. Also examine for toxicity

#### **The third step is investigation**

To investigate a solitary thyroid nodule, a **fine – needle aspiration biopsy** is the most important diagnostic test. After FNA biopsy, the majority of nodules can be categorized into

**1) benign 2) malignant 3) suspicious 4) non diagnostic**

- Benign lesion include cyst & colloid nodules, risk of malignancy in this setting is 3%.

- The risk of malignancy in suspicion lesion is 10-20%.

Most of suspicious lesion are follicular or hurthle cell neoplasm. In this situation, the diagnosis of malignancy relies on demonstrating capsular or vascular invasion, features that can not be determined via FNA biopsy.

FNA biopsy is also less reliable in patient having history of head and neck irradiation or a family history of thyroid CA, because of high likelihood of cancer and coexistent benign and malignant lesions.

If the FNA biopsy is non diagnostic (few follicular and colloid cells are present), repeat the FNA.

If 3 non diagnostic FNA, do excisional biopsy.

Most patients with thyroid nodules are euthyroid.

\* **However do TSH** measurement, and if the patient with nodules found to be hyperthyroid, do radioiodine scan to determine whether it is toxic adenoma or part of toxic multinodular goiter (isolated or dominant).

\* **Auto antibody titers** are also measured to determine whether the swelling is a manifestation of chronic lymphocytic thyroiditis.

- **Ultrasound** to 1) determine the physical characteristics of the swelling & to 2) determine a sub clinical nodulation and cystic formation.
- **CXR & X –ray of the thoracic inlet** are necessary when there is clinical evidence of tracheal deviation or compression, retrosternal extension or when clinical examination & FNA cytology indicate malignancy.

### ❖ **Treatment of solitary thyroid swelling**

- Malignant tumors are generally treated by total or near total thyroidectomy.
- Simple thyroid cyst resolve with aspiration in  $\cong$  75% of cases. If the cyst persists after 3 attempts of aspiration, do unilateral thyroid lobectomy. Lobectomy is also recommended for cyst larger than 4 cm in diameter & for complex cysts with solid & cystic components.
- If FNA biopsy shows colloid nodule, observe with serial ultrasounds & thyroglobuline measurements every 6-12 months.

If the nodule enlarges, repeat FNA biopsy.

50% of patients with colloid nodules decrease in size when giving L-thyroxin in doses sufficient to maintain a serum TSH level between 0.1 - 1 Mm. ml.

If the nodules still enlarge, do thyroidectomy for the large nodule that causes compressive symptoms & cosmetically.

If the patient have previous history of head & neck irradiation or the patient has family history of thyroid cancer, do total or near total thyroidectomy because of high incidence of thyroid cancer in these settings & because that FNA biopsy is not reliable.

- If toxic adenoma, do surgical removal of this toxic nodule.

*So the indications of surgery in solitary thyroid nodules isolated or dominant are*

- 1) Neoplasia (on FNA biopsy or clinically suspected).
- 2) Toxic adenoma
- 3) Pressure symptoms.
- 4) Cosmetics 5) patient wishes.