

CASE THREE

Short case number: 3_17_3

Category: Endocrine & Reproductive Systems.

Discipline: Medicine

Setting: General Practice

Topic: Thyroid Swelling_goitre [SDL]

Case

Joan Cooper a 40-year-old female presents with a history of swelling in her neck, she thinks it may have increased in size, but she was not really aware of it until more recently. She has otherwise been feeling well.



Questions

1. What are the key features of the history in the assessment of this patient and why?
2. What are the key features in the examination of this patient and why?
3. Summarise in a table the causes of thyroid enlargement and how their typical clinical presentation.
4. Outline the key clinical aspects of a simple diffuse goitre, multinodular goitre and a solitary thyroid nodule. Including typical presentation, thyroid function testing and other investigations and imaging.
5. Describe the natural history of simple goitre.
6. Outline the clinical features that may suggest a thyroid malignancy.
7. In a table briefly summarise the types of thyroid malignancy in terms of the origin of the tumour, the type of tumour, relative frequency and usual clinical presentation.
8. Briefly outline the indications for surgical intervention in the management of goitre?

Suggested reading:

- Kumar P, Clark ML, editors. Kumar & Clark's Clinical Medicine. 9th edition. Edinburgh: Saunders Elsevier; 2016.
- Colledge NR, Walker BR, Ralston SH, Penman ID, editors. Davidson's Principles and Practice of Medicine. 22nd edition. Edinburgh: Churchill Livingstone; 2014.
- Talley NJ & O'Connor S. Clinical examination. A Systematic Guide to Physical Diagnosis, 8th Ed. Churchill Livingstone. 2017.
- Doherty G. Current Surgical Diagnosis and Treatment. 12th Ed. McGraw Hill. 2006.

ANSWERS

1. What are the key features of the history in the assessment of this patient and why?

Symptoms of thyrotoxicosis / hyperthyroidism (see previous case)

Dysphagia, Stridor (mediastinal compression) or hoarseness (recurrent laryngeal nerve palsy)

May indicate anaplastic thyroid malignancy – or a massive goitre

2. What are the key features in the examination of this patient and why?

Palpation: Size, shape, Consistency, tenderness, mobility

Percussion (retrosternal goitre)

Auscultation (bruit – increased blood supply in hyperthyroidism)

Pemberton's sign (thoracic inlet obstruction due to retrosternal mass)

3. Summarise in a table the causes of thyroid enlargement and how their typical clinical presentation.

CAUSES OF THYROID ENLARGEMENT

Diffuse goitre

- Simple goitre
- Hashimoto's thyroiditis
- Graves' disease
- Drugs eg. Iodine, amiodarone, lithium
- Iodine deficiency (endemic goitre)
- Transient thyroiditis
- Suppurative thyroiditis
- Dyshormonogenesis
- Infiltrative e.g. Amyloidosis, sarcoidosis
- Riedel's thyroiditis

Multinodular goitre

Solitary nodule

- Simple cyst
- Colloid nodule
- Follicular adenoma
- Papillary carcinoma
- Follicular carcinoma
- Medullary cell carcinoma
- Anaplastic carcinoma
- Lymphoma
- Metastasis

4. Outline the key clinical aspects of a simple diffuse goitre, multinodular goitre and a solitary thyroid nodule. Including typical presentation, thyroid function testing and other investigations and imaging.

Diffuse goitre

In the absence of thyrotoxicosis or hypothyroidism a diffuse goitre rarely needs further investigation or treatment unless it is very large and causing cosmetic symptoms or compression of other local structures (resulting in stridor or dysphagia). The presence of autoantibodies may support the diagnosis of Graves' disease or Hashimoto's thyroiditis, while their absence in a younger patient suggests a simple goitre. Thyroxine therapy is sometimes justified in an attempt to shrink the goitre.

Multinodular goitre

Multinodular goitre is usually diagnosed in patients presenting with thyrotoxicosis, a large goitre with or without tracheal compression, or sudden painful swelling caused by haemorrhage into a nodule or cyst. The goitre is nodular or lobulated on palpation and may extend retrosternally; however, not all multinodular goitres causing thyrotoxicosis are easily palpable. Very large goitres may cause mediastinal compression with stridor, dysphagia and obstruction of the superior vena cava. Hoarseness due to recurrent laryngeal nerve palsy can occur, but is far more suggestive of thyroid carcinoma.

The diagnosis is confirmed by a radioisotope thyroid scan and/or ultrasonography. In patients with large goitres a flow-volume loop is a good screening test for significant tracheal compression. If intervention is contemplated, a chest X-ray may be helpful, but CT or MRI of the thoracic inlet is optimal to quantify the degree of tracheal displacement or compression and the extent of retrosternal extension. In those with a 'dominant', 'cold' nodule, fine needle aspiration is indicated to exclude thyroid cancer.

Solitary thyroid nodule

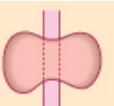
? Malignancy → especially if Hx of radiation exposure.

It is important to determine whether the nodule is benign, e.g. cyst or colloid nodule, or malignant. It is rarely possible to make this distinction on clinical grounds alone, although the presence of cervical lymphadenopathy increases the likelihood of malignancy. However, a solitary nodule presenting in childhood or adolescence, particularly if there is a past history of head and neck irradiation, or presenting in the elderly should raise the suspicion of a primary thyroid malignancy. Very occasionally, a secondary deposit from a renal, breast or lung carcinoma presents as a painful, rapidly growing solitary thyroid nodule.

5. Describe the natural history of simple goitre.

Simple goitre usually presents between the ages of 15 and 25 years, often during pregnancy, and tends to be noticed, not by the patient, but by friends and relatives. Occasionally, there is a tight sensation in the neck, particularly when swallowing. The goitre is soft and symmetrical and the thyroid is enlarged to two or three times its normal size. There is no tenderness, lymphadenopathy or overlying bruit. Concentrations of T_3 , T_4 and TSH are normal and no thyroid autoantibodies are detected in the serum. No treatment is necessary and in most cases the goitre regresses. In some, however, the unknown stimulus to thyroid enlargement

persists and, as a result of recurrent episodes of hyperplasia and involution during the following 10-20 years, the gland becomes multinodular with areas of autonomous function.

			
Age (in years)	15–25	35–55	> 55
Goitre	Diffuse	Nodular	Nodular
Tracheal compression/ deviation	No	Minimal	Yes
T ₃ , T ₄	Normal	Normal	Raised
TSH	Normal	Normal or undetectable	Undetectable

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Natural history of simple goitre

6. Outline the clinical features that may suggest a thyroid malignancy.

From a clinical standpoint, the possibility of neoplastic disease is of major concern in patients who present with thyroid nodules. Fortunately, the overwhelming majority of solitary nodules of the thyroid prove to be localized, non-neoplastic conditions (e.g. nodular hyperplasia, simple cysts, or foci of thyroiditis) or benign neoplasms such as follicular adenomas. In fact, benign neoplasms outnumber thyroid carcinomas by a ratio of nearly 10:1. Carcinomas of the thyroid are thus uncommon, accounting for well under 1% of solitary thyroid nodules. Moreover, most are indolent, permitting a 90% survival at 20 years. Several clinical criteria might provide a clue to the nature of a given thyroid nodule:

- **Solitary nodules**, in general, are more likely to be neoplastic than are multiple nodules.
- **Nodules in younger patients** are more likely to be neoplastic than are those in older patients.
- **Nodules in males** are more likely to be neoplastic than are those in females.
- A **history of radiation** treatment to the head and neck region is associated with an increased incidence of thyroid malignancy.

Nodules that take up radioactive iodine in imaging studies (*hot nodules*) are more likely to be benign than malignant.

Such general trends and statistics, however, are of little significance in the evaluation of a given patient, in whom the timely recognition of a malignancy, however uncommon, can be life-saving. Ultimately, it is the morphologic evaluation of a given thyroid nodule, in the form of fine-needle aspiration biopsy and histologic study of surgically resected thyroid parenchyma, that provides the most definitive information about its nature.

1. Papillary (most common ≥80%)
 2. Follicular
 3. Medullary
 4. Anaplastic

7. In a table briefly summarise the types of thyroid malignancy in terms of the origin of the tumour, the type of tumour, relative frequency and usual clinical presentation.

MALIGNANT THYROID TUMOURS

Origin of tumour	Type of tumour	Frequency (%)	Usual age of presentation (y)	Approx. 20y survival (%)
Follicular cells	Differentiated carcinoma			
	Papillary	70	20-40	95
	Follicular	10	40-60	60
	Undifferentiated carcinoma			
	Anaplastic	5	> 60	< 1
Parafollicular C cells	Medullary carcinoma	5-10	> 40*	50
Lymphocytes	Lymphoma	5-10	> 60	10

Most common

* Patients with medullary carcinoma as part of multiple endocrine neoplasia type 2 may present in childhood.

8. Briefly outline the indications for surgical intervention in the management of goitre?

Surgery is indicated to relieve the pressure symptoms of a large goitre for substernal goitre or to rule out cancer when there are localized areas of hardness or rapid growth.

- ① Relieve pressure symptoms
- ② Rule out cancer.