The majority of surgical conditions which arise in the neck present as a swelling. Taking the history and performing the physical examination should follow the standard pattern, but there are some important features that deserve special attention.

The history of swellings in the neck

Because the commonest cause of a swelling in the neck is an enlarged lymph gland, and because the commonest causes of enlarged lymph glands are infection and secondary tumour deposits, you must remember to ask about symptoms which might help you identify the cause of the swelling.

Systemic illness

Symptoms such as general malaise, fever and rigors and contact with people with infectious diseases may indicate an infective cause of the swelling.

Loss of appetite, loss of weight, pulmonary, alimentary or skeletal symptoms may suggest the site of a neoplasm.

Irritation of the skin associated with enlarged cervical lymph glands is often seen with lymphoma.

Head and neck symptoms

Ask about: pain in the mouth, sore throats or ulceration; nasal discharge, pain or blockage of the airway; pain in the throat, dysphagia, changes in the voice and difficulty with breathing; and lumps or ulcers on the skin of the head and face that have changed size or begun to bleed.

The skin, mouth, nose, larynx and pharynx are common sites for neoplasms, and although head and neck cancers commonly present with metastases in lymph glands, they are not usually associated with the symptoms of distant metastases such as general malaise and loss of weight.

The examination of swellings in the neck

Site

It is essential to define the site of a lump in the neck.

The neck is divided into two triangles. The anterior triangle is bounded by the anterior border of the sternomastoid muscle, the lower edge of the jaw and the mid-line. In clinical practice, the structures deep to the sternomastoid muscle are considered to be inside the anterior triangle.

The upper part of the anterior triangle, below the jaw but above the digastric muscle, is sometimes called the digastric or submandibular triangle.

The posterior triangle is bounded by the posterior border of the sternomastoid muscle, the anterior edge of the trapezius muscle and the clavicle.

To define the triangles it is necessary to get the patient to tense the neck muscles.

- The sternomastoid muscle is made to contract by putting your hand under the patient’s chin.
and asking them to nod their head against the resistance of your hand. This tightens both sternomastoids.

■ The trapezius muscle is made to contract by asking the patient to shrug (elevate) their shoulders against resistance.

Relation to muscles
Always feel lumps in the neck with the muscles relaxed and then with them contracted. If the lump is deep to a muscle, it will become impalpable when the muscle contracts.

Relation to the trachea
Swellings that are fixed to the trachea will move when the trachea moves. The trachea is pulled upwards during swallowing. Assess the relationship to the trachea of every lump in the neck by watching to see if it moves with the trachea during swallowing.

Relation to the hyoid bone
The hyoid bone moves only slightly during swallowing, but ascends when the tongue is protruded. Ask the patient to open their mouth. When the jaw is still, ask them to protrude their tongue. If the swelling in the neck moves as the tongue protrudes, it must be fixed to the hyoid bone.

CERVICAL LYMPHADENOPATHY AND OTHER NECK SWELLINGS

Causes of cervical lymph gland enlargement
Enlargement of the cervical lymph glands is the most common cause of a swelling in the neck. Even when only one gland is palpable, the adjacent glands are invariably diseased.

The four main causes of cervical lymph gland enlargement are as follows.

■ Infection: non-specific tonsillitis, glandular fever, toxoplasmosis, tuberculosis, cat scratch fever.

■ Metastatic tumour from the head, neck, chest and abdomen.

■ Primary reticuloses: lymphoma, lymphosarcoma, reticulosarcoma.

■ Sarcoidosis.

The diagnosis of lymphadenopathy caused by systemic illnesses such as glandular fever, toxoplasmosis and sarcoidosis depends upon finding lymphadenopathy elsewhere, other evidence of the underlying disease, and special blood tests.

Non-specific cervical inflammatory lymphadenopathy
Non-specific reactive lymphoid hyperplasia can follow any inflammatory process or be associated with skin conditions, particularly of the scalp, when it is termed dermatopathic lymphadenopathy. However, non-specific inflammatory lymphadenopathy

![Fig 11.2 The anatomy of the cervical lymph glands.](image)
commonly follows recurrent bouts of tonsillitis, especially if the attacks have been treated inadequately. The upper deep cervical glands are most often affected.

In a healthy child, small normal lymph glands are often palpable, especially in the posterior triangle.

**History**

*Age* When associated with tonsillitis, the majority of patients are below the age of 10 years. Other reactive conditions can occur at any age.

*Symptoms* The common presenting symptom is a painful lump just below the angle of the jaw.

The severity of the pain varies. It is usually a discomfort, which becomes acute when the patient has a sore throat.

The lump may be large enough to be visible or felt by the child's parent when washing the neck.

The child may snore at night, have difficulty in breathing, have nasal speech because of tonsillar and adenoid hyperplasia, and suffer from recurrent chest infections.

*Cause* The child and the parents frequently appreciate the relationship between the appearance of the lump and an episode of tonsillitis.

*Systemic effects* When the lump is tender the patient often feels ill, has a sore throat and pyrexia and does not want to eat.

Recurrent severe episodes can cause loss of weight and slow down the rate of growth and body maturation.

*Social history* Recurrent sore throats and upper respiratory tract infections are more common in malnurtured children living in substandard, cold, damp houses.

**Examination**

*Position* Lymph from the tonsils drains to the upper deep cervical lymph glands. The gland just below deep to the angle of the mandible is often called the *tonsillar gland*. This gland and those just below it are likely to be enlarged.

*Tenderness* If the infection is active, the enlarged glands will be tender.

*Shape and size* The tonsillar gland is usually spherical and approximately 1–2 cm in diameter. It is rarely bigger than this. The glands below it are usually smaller, even when inflamed.

*Composition and relations* Each gland is firm in consistence, solid and discrete, not fixed but not very mobile.

*Local tissues* The tonsils are likely to be enlarged and hyperaemic. Pus may be seen exuding from the surface crypts.

The glands on the other side of the neck are often just as large but may not have been noticed by the parents.

*General examination* Look for the presence of enlarged lymph glands elsewhere. None should be enlarged.

Recurrent chest infections may have damaged the lungs – look for collapsed lobes, bronchiectasis and lung abscess. However, these are rare complications nowadays.

**Tuberculous cervical lymphadenitis and abscess**

The *human* tubercle bacillus can enter the body via the tonsils, and from there move to the cervical lymph glands. The upper deep cervical glands are most often affected. There is no generalized infection, so there is little systemic disturbance of health. Infection with bovine tuberculosis ceased in the UK when the control and testing of dairy cattle was introduced.

**History**

*Age and ethnic groups* Tuberculous lymphadenitis is common in children and young adults, and in the elderly. In the UK the incidence in the young has diminished since the introduction of Bacilli.
Calmette–Guerin (BCG) vaccination, mass radiography screening and the discovery of effective anti-tuberculosis antibiotics; but the prevalence of cervical lymph gland enlargement caused by anonymous mycobacteria is increasing. In the UK, tuberculous lymphadenitis is found most often in young immigrant adults.

**Symptoms** The patient complains of a lump in the neck. This appears gradually, sometimes with, sometimes without, pain.

The pain can be intense if the glands grow rapidly and necrose.

Systemic symptoms are unusual in the young, but the elderly sometimes have anorexia and slight weight loss.

If the glands break down into an abscess, the swelling increases in size, becomes more painful and the patient notices discolouration of the overlying skin.

When the glands are very painful, neck movements and swallowing may be painful.

**Previous history** Elderly patients often have a history of swollen neck glands when young – sometimes treated at that time by surgical excision.

**Immunization** Ask whether the patient has been vaccinated with BCG.

**Family history** Check that no one in the family has had tuberculosis.

**Social history** Tuberculosis is more common in the poor and socially underprivileged.

**Examination**

**The signs of tuberculous lymphadenitis**

**Position** The upper and middle deep cervical glands are most often involved.

**Temperature** The mass of glands does not feel hot.

**Tenderness** Although the temperature of the skin is normal and the glands are often slightly tender, pain and tenderness are not prominent features of tuberculous lymphadenitis.

**Colour** If there is no abscess present, the overlying skin should look normal.

**Shape, size and consistence** In the early stages, the glands are firm, discrete and between 1 and 2 cm in diameter.

As caseation increases and the glands necrose, the infection spreads beyond the capsules of the glands. This makes the lumps enlarge and coalesce.

A typical patch of tuberculous lymphadenitis is an indistinct, firm mass of glands which occupies the upper half of the deep cervical lymph chain, partly beneath and partly in front of the sternomastoid muscle.
The glands are commonly described as **matted together**, but there may be some discrete glands above or below the matted mass.

**Local tissues** Other cervical lymph glands may be palpable. The tonsils and the other tissues in the neck should be normal.

**The signs of a tuberculous abscess**

When an infected lymph gland caseates and turns into pus, it becomes, by definition, an abscess. The natural tendency of an abscess is to weaken the overlying tissues until it bursts through them, ultimately to reach and burst through the skin. This is known as **pointing**. At the stage when a tuberculous abscess has burst through the deep cervical fascia into the subcutaneous tissues, it has two compartments, one on either side of the deep fascia, connected by a small central track. This is called a **collar-stud abscess**.

**Position** Because a tuberculous abscess forms in tuberculous lymph glands, it is most often found in the upper half of the neck.

**Colour** When the pus reaches the subcutaneous tissues, the overlying skin turns reddish-purple.

**Temperature** The skin temperature is normal because the process of caseation and pus formation is slow and does not stimulate excessive hyperaemia – hence the name **cold abscess**.
Cervical lymphadenopathy and other neck swellings

Tenderness The mass is tender, sometimes exquisitely so if the abscess is tense.

Shape The deep part of the abscess tends to be sausage shaped, with its long axis parallel to the front edge of the sternomastoid muscle. The superficial pocket of the abscess is usually lower than the deep part.

Size Most tuberculous abscesses are 3–5 cm across, but they can be much larger.

Surface The surface is irregular and indistinct.

Edge The edges are moderately well defined if the abscess is tense, but you will not be able to feel a definite surface or edge if the pocket of pus is lax.

Composition The abscess feels firm and rubbery and if there is sufficient pus present, it will fluctuate. This latter sign cannot be elicited if the abscess is small and deep to the sternomastoid muscle.

The subcutaneous part of a collar-stud abscess should be clearly fluctuant, but it is not usually possible to reduce the superficial pocket of pus into the deep pocket.

Relations The original abscess is deep to the deep fascia, partly under the sternomastoid muscle, and fixed to surrounding structures. The superficial part of a collar-stud abscess is immediately below the skin and becomes more prominent when the sternomastoid muscle is contracted. If spontaneous discharge occurs, a chronic sinus may form. Tuberculous sinuses are characterized by minimal erythema and lack of pain, unless secondarily infected.

The other lymph glands in the neck near the abscess may be enlarged.

General examination When the patient has tuberculous lymphadenitis there are often no systemic abnormalities; but when a tuberculous abscess develops there may be tachycardia, pyrexia, anorexia and general malaise.

There may be signs of tuberculosis in the lungs, in other lymph glands and in the urinary tract.

Carcinomatous lymph glands

Metastatic deposits of cancer cells in the cervical lymph glands are the commonest cause of cervical lymphadenopathy in adults.

The primary cancer is most often in the buccal cavity (tongue, lips and mucous membrane) and larynx, but every possible primary site must be examined when cervical glands are thought to be enlarged by secondary deposits.

History

Age Most head and neck cancers occur in patients over the age of 50. Most patients presenting with metastatic deposits in their cervical lymph glands are between 55 and 65 years.

The exception is papillary carcinoma of the thyroid, which occurs in children and young adults.

FIG 11.6 A chronic tuberculous sinus that has become secondarily infected.

FIG 11.7 This patient presented with hard, enlarged lymph glands in the neck. The primary lesion was the insignificant mole above his right eyebrow.
Sex Most of the head and neck cancers are more common in men than in women.

Local symptoms The patient complains of a **painless lump** in the neck, which they have seen or felt by chance.

It is uncommon for carcinomatous glands to be tender or to become so large that they interfere with neck movements before being noticed.

The lump **grows slowly**, and **new lumps may appear**.

General symptoms The patient may have symptoms from a primary lesion in the head or neck, such as a sore tongue or a hoarse voice. If the primary is in the chest, they may have a cough or haemoptysis; if it is in the abdomen, they may have dyspepsia or abdominal pain.

Generally speaking, head and neck cancers do not cause anorexia and weight loss, whereas cancers in the lungs and intra-abdominal organs do.

Examination

**Site** The site of the affected glands gives a crude indication of the site of the primary. Lesions above the hyoid bone drain to the upper deep cervical glands. The larynx and thyroid drain to the middle and lower deep cervical glands. An enlarged supraclavicular lymph gland commonly indicates intra-abdominal or thoracic disease. When enlarged by metastases, this gland is called **Virchow’s gland**; its presence is **Troisier’s sign**.

**Colour** The overlying skin is a normal colour unless the mass is so large that it stretches or infiltrates the skin, which makes it pale or blotchy red.

**Temperature** The skin temperature will be normal unless the tumour is very vascular.

**Tenderness** Glands containing secondary deposits are **not tender**.

**Shape and size** Glands containing metastases vary in size and shape. Both features depend upon the amount of tumour within them and the rate of its growth. At first the glands are **smooth, discrete** and a **variety of sizes**. As they grow, they may coalesce into one large mass.

**Composition** Glands containing tumour are **hard**, often stony hard. Rarely, a very vascular tumour deposit will be soft, pulsatile and compressible.

**Relations** The glands are tethered to the surrounding structures, so they can usually be moved in a transverse direction, but not vertically.

Their relation to the sternomastoid muscle varies according to the group to which they belong. Secondary cancer is more common in the glands of the anterior than the posterior triangle. These glands are deep to the anterior edge of the sternomastoid.

If the tumour spreads beyond the capsules of the glands, the mass becomes completely fixed.

**Local tissues** The overlying skin and muscle may be infiltrated with tumour, in which case the tumour must be distinguished from secondary deposits actually in the skin.

**Lymph drainage** Other lymph glands on the pathway between the primary lesion and the gland complained of by the patient, and beyond it, may be enlarged.
General examination Examine all the sites which might contain the primary lesion, in particular:

- the skin of the scalp, the ear and the external auditory meatus,
- the lips, tongue, buccal mucous membrane and tonsils,
- the nose, maxillary antra and nasopharynx,
- the thyroid gland,
- the skin of the upper limb,
- the breasts,
- the lungs,
- the stomach, pancreas, ovaries and testes.

The symptoms and signs of malignant disease originating in these organs are discussed in the appropriate chapters.

Some of this examination requires special instruments, for example a head mirror and light and a laryngeal mirror.

Primary neoplasms of the lymph glands (Reticuloses, lymphoma)

The most common primary tumour of lymphoid tissue is the malignant lymphoma. There are many histological varieties of lymphoma, but they are often collectively and loosely divided into Hodgkin’s and non-Hodgkin’s lymphoma.

History

Age The reticuloses are common in children and young adults.

Sex Males are affected more often than females.

Symptoms The most common presenting symptom is a painless lump in the neck, which is noticed by chance and grows slowly.

Malaise, weight loss and pallor are common symptoms.

Itching of the skin (pruritus) is an unexplained but distinctive complaint.

There may be fever with rigors, occurring in a periodic fashion (Pel–Ebstein fever).

Lymphomatous infiltration of the skeleton may cause pains in the bones, and there may be abdominal pain after drinking alcohol.

If there are large masses of lymph glands in the mediastinum, they may occlude the superior vena cava, causing venous congestion in the neck and the development of collateral veins across the chest wall.

Large masses in the abdomen can obstruct the inferior vena cava and cause oedema of both legs.
Examination

Site Any of the cervical lymph glands can be affected. Lymphoma is one of the few conditions, apart from infection, that often causes lymphadenopathy in the posterior triangle.

Tenderness The glands are not tender.

Shape, size and surface The lymph glands in Hodgkin’s disease are ovoid, smooth and discrete.

It is possible to define individual glands even when they become large. This is the opposite to tuberculosis, in which the lymph glands become matted and indistinct.

Consistence Glands infiltrated by lymphoma are solid and rubbery in consistence.

Relations Although tethered to nearby structures, these glands can usually be moved from side to side and rarely become completely fixed.

Local tissues The surrounding tissues should be normal.

General examination Other groups of lymph glands may be enlarged. The liver and spleen may be palpable. The patient is often anaemic and may be jaundiced.

Spread to the skin produces elevated, reddened, scaly patches of skin known as mycosis fungoides.

Branchial cyst

A branchial cyst is a remnant of a branchial cleft, usually the second cleft. It is therefore lined with squamous epithelium, but there are also patches of lymphoid tissue in the wall which are connected with the other lymph tissue in the neck and which can become infected.

History

Age Although these cysts are present at birth, they may not distend and cause symptoms until adult life. The majority present between the ages of 15 and 25 years, but a number appear in the 40s and 50s.

Sex Males and females are equally affected.
Symptoms The common presenting complaint is a painless swelling in the upper lateral part of the neck. The lump may be painful when it first appears and later cause attacks of pain associated with an increase in the size of the swelling. The pain is usually caused by infection in the lymphoid tissue in the cyst wall. A severe throbbing pain, exacerbated by moving the neck and opening the mouth, develops if the contents of the cyst become infected and purulent.

General effects These cysts have no systemic effects and are not associated with any other congenital abnormality.

Examination Position A branchial cyst lies behind the anterior edge of the upper third of the sternomastoid muscle, and bulges forwards. Very rarely, the cyst can bulge backwards behind the muscle.

Colour and tenderness The overlying skin may be reddened and the lump may be tender if the cyst is inflamed.

Shape The cyst is usually ovoid, with its long axis running forwards and downwards.

Size Most branchial cysts are between 5 and 10 cm long.

Surface Their surface is smooth and the edge distinct.

Composition The consistence varies with the tension of the cyst. Most cysts are hard, but a lax cyst feels soft. They are dull to percussion. The lump fluctuates. This sign is not always easy to elicit, especially if the cyst is small and the sternomastoid muscle thick.

The lump is usually opaque because it contains desquamated epithelial cells that make its contents thick and white. Sometimes the fluid is golden yellow and shimmers with fat globules and cholesterol crystals secreted by the sebaceous glands in the epithelial lining. Such cysts may transilluminate.

The cyst cannot be reduced or compressed.

Relations It is important to ascertain that the bulk of the mass is deep to the upper part of the
The neck

The neck sternomastoid muscle. It is not very mobile because it is closely tethered to the surrounding structures.

Lymph drainage The local deep cervical lymph glands should not be enlarged. If they are palpable, you should reconsider your diagnosis in favour of an inflammatory process such as a tuberculous abscess rather than a branchial cyst. The other cystic lesions that are often operated upon as presumed branchial cysts are often secondary cystic lymph gland deposits from a papillary carcinoma of the thyroid.

Local tissues The local tissues should be normal.

If the cyst has turned into an abscess, the surrounding tissues will be oedematous and the skin hot and red.

Branchial fistula (or sinus)

This is a rare congenital abnormality. It is the remnant of a branchial cleft, usually the second cleft, which has not closed off.

The patient complains of a small dimple in the skin at the junction of the middle and the lower third of the anterior edge of the sternomastoid muscle, that discharges clear mucus, and sometimes becomes swollen and painful and discharges pus.

When the whole branchial cleft stays patent, the fistula connects the skin with the oropharynx, just behind the tonsil. In most cases the upper end is obliterated and the track should really be called a branchial sinus.

Swallowing accentuates the openings on the skin.

Carotid body tumour

This is a rare tumour of the chemoreceptor tissue in the carotid body. It is therefore a chemodectoma. It is usually benign, but can become quite large and, occasionally, malignant.

History

Age Chemodectomata commonly appear in patients between the ages of 40 and 60 years.

Symptoms The common presentation is a painless, slowly growing lump. The patient may notice that the lump pulsates, and may also suffer from symptoms of transient cerebral ischaemia (blackouts, transient paralysis or paraesthesia). These symptoms are unusual because the increasing compression of the carotid artery by the tumour is a very slow process.

Development The lump grows so slowly that many patients ignore it for many years.

Multiplicity Carotid body tumours may be bilateral.

Examination

Always be especially gentle when palpating a lump close to the bifurcation of the carotid artery. Pressure in this area can induce a vasovagal attack.

Position The carotid bifurcation is at, or just below, the level of the hyoid bone. Carotid body tumours

![A carotid body tumour should be level with the hyoid cartilage.](image1)

FIG 11.15 The site of a carotid body tumour.

![A carotid body tumour. Note that the visible mass is lower than that of a branchial cyst (see Fig. 11.13) but indistinguishable on inspection from an enlarged cervical lymph gland. Most carotid body tumours are initially mistaken for enlarged lymph glands.](image2)
Cervical lymphadenopathy and other neck swellings

are therefore found in the upper part of the anterior triangle of the neck, level with the hyoid bone and beneath the anterior edge of the sternomastoid muscle.

Tenderness, colour and temperature  These tumours are not tender or hot, and the overlying skin should be normal.

Shape  The lump is initially spherical but, as it grows, it becomes irregular in shape, often narrower at its lower end, where it is caught at the bifurcation of the common carotid artery.

Size  Carotid body tumours may vary from 2–3 cm to 10 cm in diameter.

Composition  The majority of these tumours are solid and hard. They are dull to percussion and do not fluctuate. They are often called potato tumours because of their consistence and shape.

Sometimes these tumours pulsate. This is either a transmitted pulsation from the adjacent carotid artery, or a palpable external carotid artery running over the superficial aspect of the lump, or a true expansile pulsation from a soft or very vascular tumour.

It is surprising that in spite of their vascularity most of these tumours are hard. Those which are soft and very vascular not only have an expansile pulsation, but can also be compressed.

Relations  The lump is deep to the cervical fascia and beneath the anterior edge of the sternomastoid muscle.

The common carotid artery can be felt below the mass, and the external carotid artery may pass over its superficial surface. Without this close relationship to the arteries, this tumour is indistinguishable from an enlarged lymph gland.

Because of their intimate relationship with the carotid arteries, these tumours can be moved from side to side but not up and down.

Cystic hygroma  
(Lymph cyst, lymphocele, lymphangioma)

A cystic hygroma is a congenital collection of lymphatic sacs which contain clear, colourless lymph. They are probably derived from clusters of lymph channels that failed, during intra-uterine development, to connect with and become normal lymphatic pathways. Lymph cysts commonly occur near the root of the arm and the leg (i.e. in the anatomical junction between the limbs and head and the trunk).

History

Age  The majority of cystic hygromata present at birth or within the first few years of life, but they occasionally stay empty until infection or trauma in adult life causes them to fill up and become visible. Occasionally large lymphoceles can be seen in elderly patients.

Symptoms  The only symptom is the complaint about the lump, but the parents of an affected child are usually more concerned about the disfigurement caused by the cyst.

Family history  This condition is not familial.

Examination

Position  Cystic hygromata are commonly found around the base of the neck, usually in the posterior
The neck

Temperature and tenderness They are not hot or tender, and the overlying skin is normal.

Shape A cystic hygroma is a mixture of soft unilocular and multilocular cysts, so the whole mass looks lobulated and flattened.

Size The small cysts are a few centimetres across. Large cysts can extend over the whole of one side of the neck.

Surface If the cysts are close to the skin, it may not be possible to feel a distinct surface. Deep cysts feel smooth, but because they are lax their edges are often indistinct.

Composition Cystic hygromata are soft and dull to percussion. They fluctuate easily but, because they are close to the skin and contain clear fluid, their distinctive physical sign is a brilliant translucence.

Large cysts will conduct a fluid thrill, and in some multilocular swellings the fluid in one loculus can be compressed into another.

They cannot be reduced.

Relations Cystic hygromata develop in the subcutaneous tissues. Thus they are superficial to the neck muscles and close to the skin but are rarely fixed to the skin. However, it is essential to perform a thorough examination of the oropharynx, as a cyst in the posterior triangle may extend deeply beneath the sternomastoid muscle into the retropharyngeal space.

Lymph glands The local lymph glands should not be enlarged and, as the lymph drainage of the tissues around the cyst is normal, there is no lymphoedema. If there is associated lymphadenopathy, reconsider the diagnosis, as cystic nodal metastases of papillary thyroid carcinoma can present as large, painless cystic swellings in the neck.

Local tissues The local tissues are normal.

Pharyngeal pouch

A pharyngeal pouch is a pulsion diverticulum of the pharynx through the gap between the horizontal fibres of the cricopharyngeus below and the lowermost oblique fibres of the inferior constrictor muscle above. If swallowing is uncoordinated so that the sphincter-like fibres of the cricopharyngeus do not relax, the weak unsupported area just above these fibres (known as Killian’s dehiscence) bulges out.
Eventually the bulge grows into a sac, which hangs down and presses against the side of the oesophagus.

**History**

**Age** Pharyngeal pouches appear in middle and old age.

**Sex** They are more common in men than in women.

**Symptoms** Patients often have a long history of halitosis and recurrent sore throats before noticing the common presenting symptom of **regurgitation of froth and food**. The regurgitated food is undigested and comes up into the mouth at any time. There is no bile or acid taste to it.

Regurgitation at night causes **bouts of coughing and choking**, and if pieces of food are inhaled, a **lung abscess** may develop.

As the pouch grows, it presses on the oesophagus and causes **dysphagia**. Patients can sometimes swallow their first few mouthfuls of food (until the pouch is full), but thereafter have difficulty in swallowing.

By the time these symptoms become severe, the patient may have noticed a **swelling in the neck**, and find that pressure on the swelling causes **gurgling sounds** and regurgitation. The swelling changes in size and often disappears.

If the dysphagia continues, the patient may become **malnourished** and **lose weight**.

**Examination**

**Position** In most patients there is no palpable swelling, but when a swelling caused by a pharyngeal pouch is apparent, it appears **behind the sternomastoid muscle**, below the level of the thyroid cartilage.

**Shape** Its shape is indistinct because only part of its surface is palpable. It feels like a bulging deep structure.

**Size** Most pouches only cause a swelling of 5–10 cm diameter. The pouch is not palpable when it is smaller, so many patients have symptoms but no abnormal physical signs.

**Surface and edge** The surface is smooth, but the edge is not palpable.

**Composition** The lump is **soft** and sometimes **indentable**. It is dull to percussion and does not fluctuate or transilluminate.

It can be **compressed** and sometimes **emptied**. Compression may cause regurgitation. Although the mass may disappear with compression, not to return until the patient eats again, it cannot be said to have been ‘reduced’ according to the usual meaning of the word.
Relations A pharyngeal pouch lies deep to the deep fascia, behind the sternomastoid muscle, and is fixed deeply. Its origin from a structure behind the trachea can be appreciated during palpation, but the neck of the pouch and its attachment to the oesophagus cannot be felt.

It cannot be moved about in the neck.

Lymph glands The cervical lymph glands should not be enlarged.

Local tissues The surrounding tissues feel normal. Indeed, when the pouch is empty the whole neck feels normal.

General examination Pay special attention to the chest, as there may be an aspiration pneumonia, collapse of a lobe or a lung abscess.

Sternomastoid ‘tumour’ (Ischaemic contracture of a segment of the sternomastoid muscle)

This is a swelling of the middle third of the sternomastoid muscle. In neonates it consists of oedema around an infarcted segment of the muscle, caused by the trauma of birth. As the patient grows, the lump disappears and the abnormal segment of muscle becomes fibrotic and contracted.

History

Age The lump is noticed at birth or in the first few weeks of life.

Symptoms The mother may notice the lump or that the child keeps their head turned to one side – torticollis. Attempts to turn the head straight may cause pain or distress.

If the muscle is not extensively damaged, the swelling slowly subsides, the muscle spasm relaxes and the torticollis disappears. If the muscle damage becomes an area of permanent fibrosis, the twist and tilt of the head to one side becomes more noticeable as the child grows.

Examination

The lump

Position The swelling lies in the middle of the sternomastoid muscle (i.e. in the middle third of the neck on the antero-lateral surface).
The eyes

Look at the eyes and watch their movements to detect any squint. Torticollis can be a means of correcting a squint. Move the head into a vertical and central position and watch the eyes. If the torticollis is secondary to a squint and not a sternomastoid tumour, the squint will appear as the head is straightened.

The head

An uncorrected torticollis may affect the growth of the facial bones and cause facial asymmetry.

In adults, recent onset torticollis usually just represents muscle spasm.

Cervical rib

Although the cervical rib can cause serious neurological and vascular symptoms in the upper arm,
clinical examination of the neck does not usually reveal any abnormalities. The abnormal rib is usually detected with an X-ray. Sometimes there is a fullness at the root of the neck, but it is rarely distinct enough to justify a firm clinical diagnosis of cervical rib. Occasionally it can be associated with aneurysmal change in the subclavian artery.

The common neurological symptoms caused by a cervical rib are pain in the C8 and T1 dermatomes, and wasting and weakness of the small muscles in the hand. Vascular symptoms such as Raynaud’s phenomenon, trophic changes, even rest pain and gangrene, may occur but are uncommon.

**Thyroglossal cyst**

The thyroid gland develops from the lower portion of the thyroglossal duct, which begins at the foramen caecum at the base of the tongue and passes down to the pyramidal lobe of the isthmus of the thyroid gland. If a portion of this duct remains patent, it can form a thyroglossal cyst.

Theoretically, thyroglossal cysts can occur anywhere between the base of the tongue and the isthmus of the thyroid gland, but they are commonly found in two sites: between the isthmus of the thyroid gland and the hyoid bone, and just above the hyoid bone. Thyroglossal cysts within the tongue and in the floor of the mouth are rare.

**History**

*Age* Thyroglossal cysts appear at any age, but the majority are seen in patients between 15 and 30 years old.

*Sex* They are more common in women than in men.

*Symptoms* The commonest symptom is a **painless lump** in a prominent and noticeable part of the neck. **Pain, tenderness** and an **increase in size** occur only if the cyst becomes infected.

*Duration of symptoms* The lump may have been present for many years before an increase in its size causes the patient to complain.

*Systemic symptoms* There are no systemic symptoms associated with this condition.

**Examination**

*Position* Thyroglossal cysts lie close to the mid-line, somewhere between the chin and second tracheal ring. In the fetus the thyroglossal duct is in the
Cervical lymphadenopathy and other neck swellings

Composition

Thyroglossal cysts have a firm or hard consistence, depending upon the tension within the cyst. Some cysts are too tense and others too small to fluctuate, but the majority of thyroglossal cysts are between these extremes and fluctuate with ease. Some cysts transilluminate but many do not, either because the contents have become thickened by desquamated epithelial cells or the debris of past infection, or because they are too small.

Revision panel 11.3

A scheme for the diagnosis of swellings in the neck (deep to the deep fascia)

After your examination you should be able to answer four critical questions:

1. Is there one or more than one lump?
2. Where is the lump?
3. Is it solid or cystic?
4. Does it move with swallowing?

Multiple lumps are invariably lymph glands

A single lump

In the anterior triangle that does not move with swallowing

Solid:
- a lymph gland
- carotid body tumour

Cystic:
- cold abscess
- branchial cyst

In the posterior triangle that does not move with swallowing

Solid:
- a lymph gland

Cystic:
- cystic hygroma
- pharyngeal pouch
- occasionally a secondary deposit of a papillary thyroid carcinoma

Pulsatile:
- subclavian aneurysm

In the anterior triangle that moves with swallowing

Solid:
- thyroid gland
- thyroid isthmus lymph gland

Cystic:
- thyroglossal cyst

mid-line, but when a cyst forms in adult life it often slips to one side of the mid-line, especially if it develops in front of the thyroid cartilage.

Colour, temperature and tenderness

If the cyst is infected, the overlying skin will be red, hot and tender. When there is no infection, the overlying skin is normal.

Shape and surface

Thyroglossal cysts are spherical and smooth, with a clearly defined edge.

Size

They vary from 0.5 to 5 cm in diameter. Because a lump in the front of the neck is so noticeable, patients often complain of these cysts when they are very small.
The thyroglossal duct is always closely related, usually fixed, to the hyoid bone. When the hyoid bone moves the cyst also moves.

The hyoid bone moves upwards when the tongue is protruded. First, ask the patient to open their mouth and keep the lower jaw still; next hold the cyst with your thumb and forefinger, and then ask the patient to protrude their tongue. If the cyst is fixed to the hyoid bone, you will feel it tugged upwards as the tongue goes out. This is a difficult sign to elicit.

Do not expect to see much movement. It is easier to feel the tugging sensation than to actually see the movement. Although this test is diagnostic of attachment to the hyoid cartilage, the absence of movement does not exclude the diagnosis. Indeed, this sign is absent from most cysts that are below the level of the thyroid cartilage.

Lonymph glands The local lymph glands should not be enlarged unless there is secondary infection of the cyst.

Local tissues Whenever there is an abnormality of thyroid gland development, examine the base of the tongue for ectopic (lingual) thyroid tissue. A lingual thyroid looks like a flattened strawberry sitting on the base of the tongue.

THE THYROID GLAND

SYMPTOMS OF THYROID DISEASE

The thyroid gland can cause two groups of symptoms and signs: those connected with the swelling in the neck, and those related to the endocrine activity of the gland. Therefore, in order to appreciate fully the symptoms and signs that may be produced by diseases of the thyroid, a clear understanding of the physiology of the gland is essential. The history and examination should be directed towards detecting both local and general symptoms and signs that may be produced, either by any physical abnormality in the configuration of the thyroid or by any pathophysiological abnormality of its endocrine activity.

Neck symptoms

A lump in the neck

The majority of thyroid swellings grow slowly and painlessly. Quite often the patient will come across a swelling coincidentally when washing, or a member of their family or a close friend will point it out to them. Other swellings may have been there for some years before the patient suddenly decides to seek advice concerning their nature and management. In a few patients, a lump will appear suddenly and may be painful, or a long-standing lump may enlarge quickly.

A rapid change in the size of part of the gland, or of an existing lump, may be caused by haemorrhage into a necrotic nodule, a fast-growing carcinoma,
Physiology of the thyroid gland

Changes in hormone activity can be assessed by:
- clinical examination
- measuring circulating tri-iodothyronine (T3) and thyroxine (T4)
- measuring the rate and quantity of radioactive iodine taken up by the gland.

Hormone secretion can be suppressed by:
- iodine, which inhibits hormone release
- potassium perchlorate, which interferes with iodine trapping
- carbimazole and thiouracil, which inhibit the iodination of tyrosine and the coupling of tyrosines to make thyronines
- destroying the gland surgically or with radiotherapy.

Symptoms of thyroid disease

or subacute thyroiditis. The sudden enlargement of a lump caused by haemorrhage is usually painful, whereas a fast-growing anaplastic carcinoma is not usually painful until it invades nearby structures. A special feature of papillary and follicular carcinomata of the thyroid gland is their very slow growth. They may exist as a lump in the neck for many years before metastasizing. Thus the length of
time that a lump has been present is no indication as to its underlying nature.

**Discomfort during swallowing**

Large swellings may give the patient a tugging sensation in the neck when they swallow. This is not true dysphagia. Thyroid swellings rarely obstruct the oesophagus because the oesophagus is a muscular tube that is easily stretched and pushed aside. However, because the thyroid has to be pulled upwards with the trachea in the first stage of deglutition, an enlarged gland can make swallowing uncomfortable, or even difficult.

**Dyspnoea**

Deviation or compression of the trachea by a mass in the thyroid may cause difficulty in breathing. This symptom is often worse when the neck is flexed laterally or forwards and when the patient lies down. The whistling sound of air rushing through a narrowed trachea is called **stridor**.

**Pain**

Pain is not a common feature of thyroid swellings. Acute and subacute thyroiditis can present with a painful gland, and Hashimoto’s disease often causes an uncomfortable ache in the neck.

Anaplastic carcinoma can cause local pain and pain referred to the ear if it infiltrates surrounding structures.

**Hoarseness**

A change in the quality of the voice of a patient with a lump in the neck is a very significant symptom because it is probably caused by a paralysis of one of the recurrent laryngeal nerves, which means that the lump is likely to be malignant and infiltrating the nerve.

**Symptoms and signs of endocrine dysfunction**

Every patient with any thyroid disorder should be a carefully questioned and examined for any symptoms or signs of endocrine dysfunction.

**Symptoms and signs of thyrotoxicosis**  
(see also pages 299–301)

*Nervous system* Symptoms include nervousness, irritability, insomnia and nervous instability, and examination may reveal a tremor of the hands. Occasionally a full-blown thyrotoxic psychosis may be apparent.

*Cardiovascular system* Symptoms include **palpitations**, breathlessness on exertion, swelling of the ankles and chest pain, which may be manifest as tachycardia, auricular fibrillation dyspnoea and peripheral swelling.

*Metabolic and alimentary systems* There is an **increase in appetite but loss of weight**, and sometimes a change of bowel habit, usually diarrhoea. Proximal muscle myopathies may occur with **wasting** and **weakness**. The patient has a preference for **cold weather**, and often complains of excessive **sweating** and an intolerance of hot weather. Some women have a change of menstruation, usually **amenorrhoea**.

**Symptoms and signs of myxoedema**  
(see also pages 301–3)

There is an **increase of weight**, with deposition of fat across the back of the neck and shoulders. Symptoms also include: **slow thought, speech and action; intolerance of cold weather; loss of hair**, especially the outer third of the eyebrows; **muscle fatigue; a dry skin** and ‘peaches and cream’ complexion; and **constipation**.

**EXAMINATION OF THE THYROID GLAND**

Although this should be part of the general examination, the method of examining the neck is described in detail because it is so important. The important features of the general and eye examination are also reiterated.

Concentrate upon both the nature of any gland enlargement or abnormal configuration, as well as any change in endocrine activity. It is best to assess both aspects in a combined approach, rather than try to assess each separately.

**Look at the whole patient**

First confirm that the swelling in the neck is in the thyroid gland by watching to see if it **moves when the patient swallows**. Then **look at the whole patient**.

Are they sitting still and composed, or fidgeting about, constantly moving their fingers and looking nervous and agitated, or are they slow and ponderous in their movements?
EXAMINATION OF THE THYROID GLAND.

Try to decide if there is:
- one lump
- two lumps
- diffuse enlargement

FIG 11.33 EXAMINATION OF THE THYROID GLAND.

Look at the eyes and the neck and ask the patient to swallow.

Palpate the neck from behind, with the thumbs pushing the head forwards to flex the neck slightly.

Palpate both lobes and the isthmus with the fingers flat.

If one lobe is difficult to feel, make it more prominent by pressing firmly on the opposite side.

Feel the trachea.

Percuss the lower limit of the gland.

Listen over the gland for a systolic bruit.
The neck

Are they thin or fat? Where is the wasting or the fattening? Patients with thyrotoxicosis have a generalized loss of weight, especially about the face, but may also have localized wasting of their hands, face and shoulder muscles.

Are they under-clothed and sweaty, or wrapped up in a large number of jumpers but still cold?

Look at the hands

- Feel the pulse  Tachycardia suggests thyrotoxicosis; bradycardia suggests myxoedema. In middle-aged and elderly patients thyrotoxicosis may cause atrial fibrillation.
- Are the palms moist and sweaty?
- Is there a tremor?  Test for a tremor by asking the patient to hold their arms out in front of them, elbows and wrists straight, fingers straight and separated. Thyrotoxicosis causes a fine, fast tremor. If in doubt, hold out your own hand beside the patient’s for comparison. A fine tremor may be accentuated by placing a sheet of paper over the fingers.

Examine the eyes

Eye symptoms

Patients who suffer from thyrotoxicosis may complain of staring or protruding eyes and difficulty closing their eyelids (exophthalmos), double vision caused by muscle weakness (ophthalmoplegia) and swelling of the conjunctiva (chemosis). They may get pain in the eye if the cornea ulcerates.

There are four important underlying changes that can occur in the eyes of patients with hyperthyroidism that produce the above effects (Figs 11.34 and 11.35). Each one may be unilateral or bilateral.

Lid retraction and lid lag

This sign is caused by over-activity of the involuntary (smooth muscle) part of the levator palpebrae superioris muscle. If the upper eyelid is higher than normal and the lower lid is in its correct position, the patient has lid retraction. Do not be deceived into thinking this abnormality is caused by exophthalmos.

When the upper lid does not keep pace with the eyeball as it follows a finger moving from above downwards, the patient has lid lag.

<table>
<thead>
<tr>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper lid halfway between pupil and superior limbus</td>
</tr>
<tr>
<td>Lower lid at a tangent to inferior limbus</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lid retraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper lid raised</td>
</tr>
<tr>
<td>Lower lid normal</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exophthalmos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both lids moved away from centre with sclera visible below or all round the iris</td>
</tr>
</tbody>
</table>

N.B. This is not exophthalmos

FIG 11.34 The relations of the eyelids to the iris.
Examination of the thyroid gland

Exophthalmos.

Wasting and loss of hair (and exophthalmos).

Severe lid retraction but no exophthalmos.

Exophthalmos but no lid retraction.

Unilateral lid retraction.

Wasting and loss of hair (and exophthalmos).

Exophthalmos and lid retraction.

Chemosis. The conjunctiva is hyperaemic and bulging over the eyelid. There is exophthalmos, lid retraction and peri-orbital oedema.

Severe lid retraction but no exophthalmos.

**FIG 11.35** SOME EYE SIGNS ASSOCIATED WITH THYROTOXICOSIS.
Exophthalmos

If the eyeball is pushed forwards by an increase in retro-orbital fat, oedema and cellular infiltration, the normal relationship of the eyelids to the iris is changed. Sclera becomes visible below the lower edge of the iris (the inferior limbus).

Because the eyes are pushed forwards, the patient can **look up without wrinkling the forehead**, but will have **difficulty converging**. In severe exophthalmos the patient cannot close their eyelids and may develop corneal ulceration.

Ophthalmoplegia

Although exophthalmos stretches the eye muscles, it does not usually affect their function. The cause of the weakness of the ocular muscles (ophthalmoplegia) associated with severe exophthalmos is oedema and cellular infiltration of the muscles themselves and of the oculomotor nerves. The muscles most often affected are the superior and lateral rectus and inferior oblique muscles. Paralysis of these muscles prevents the patient looking upwards and outwards.

Chemosis

Chemosis is oedema of the conjunctiva. The normal conjunctiva is smooth and invisible. A thickened, crinkled, oedematous and slightly opaque conjunctiva is easy to recognize.

Chemosis is caused by the obstruction of normal venous and lymphatic drainage of the conjunctiva by the increased retro-orbital pressure.

Inspect the neck

After checking that the lump is in the anatomical site of the thyroid gland, **ask the patient to swallow**. The patient may need a sip of water to help deglutition. **All thyroid swellings ascend during swallowing.**

Observe the general contours and surface of the swelling. The skin may also be puckered and pulled up by swallowing if the patient has a thyroid carcinoma which has infiltrated into the skin, although this is uncommon.

Ask the patient to open their mouth and then to **put out their tongue**. If the lump moves up as the tongue comes out, it must be attached to the hyoid bone, and is likely to be a thyroglossal cyst.

The neck veins will be distended if there is a mass obstructing the thoracic inlet.

Look at the position of the thyroid cartilage. Is it in the centre of the neck or deviated to one side?
Palpate the neck from the front

The most important part of palpation is done from behind (see below), but it is worthwhile placing your hand on any visible swelling while standing in front of the patient, to confirm your visual impression of its size, shape and surface, and to find out if it is tender. It is sometimes helpful to measure and record the circumference of the neck with a tape measure.

Check the position of the trachea. This is best done by feeling with the tip of two fingers in the suprasternal notch. The trachea should be exactly central at this point. When a thyroid mass extends below the suprasternal notch and obscures the trachea, you must examine the thyroid cartilage. A mass that is displacing the trachea will tilt the thyroid cartilage laterally.

Palpate the neck from behind the patient

Stand behind the patient. Place your thumbs on the ligamentum nuchae and tilt the patient’s head slightly forwards to relax the anterior neck muscles. Let the palmar surface of your fingers rest on each side of the neck. They will be resting on the lateral lobes of the thyroid gland. A small lobe can be made prominent and easier to feel by pressing firmly on the opposite side of the neck.

Ask the patient to swallow while you are palpating the gland to confirm that any swelling moves with swallowing and is actually part of the thyroid. This manoeuvre also lifts up lumps that are lying behind the sternum into the reach of your fingers.

At the end of palpation you should know the following facts about the gland and/or the lump: tenderness, shape, size, surface and consistence.

A normal thyroid gland is not palpable.

Palpate the whole of the neck for any cervical and supraclavicular lymphadenopathy.

Auscultation

Listen over the swelling. Thyrotoxic and vascular glands and lumps may have a systolic bruit.

General examination

Pay particular attention to the cardiovascular and nervous systems for any evidence of hyperthyroidism or hypothyroidism, the signs and symptoms of which are described on pages 299–303.

DIFFERENT FORMS OF GOITRE

Simple hyperplastic goitre

Simple enlargement of the thyroid gland is invariably caused by excess stimulation by thyroid-stimulating hormone (TSH), the production of which is stimulated by low levels of circulating thyroid hormone. Relative iodine deficiency is the commonest pathological cause for a low level of thyroid hormone production. Physiological states that require increased activity of the thyroid gland, such as puberty and pregnancy, are also associated with enlargement of the gland.

The term colloid goitre is used to describe the late stage of diffuse hyperplasia, when all the acini are distended with colloid which has not been released because the stimulation by TSH has dropped off.

History

Age In areas where goitre is endemic (i.e. prevalent in the local population), hyperplastic goitres appear in childhood.

Revision panel 11.6
Plan for the examination of a patient with a goitre

Look at the whole patient for agitation, nervousness or lethargy.
Examine the hands for sweating, tremor, tachycardia.
Examine the eyes for exophthalmos, lid lag, ophthalmoplegia, chemosis.
Examine the neck: always check that the lump moves with swallowing.
Palpate the cervical lymph glands.
Sporadic physiological hyperplastic goitres appear at puberty, during pregnancy, and during severe illnesses and emotional disturbances, and so they are commonly seen in puberty and young adult life. 

**Sex**  Hyperplastic goitres are five times more common in women than in men.

**Geography**  Endemic goitre is common in places where the drinking water has a low iodine content, such as the habitable valleys of the Alps, Andes, Himalayas and Rocky Mountains, and the lowland areas that depend upon water from mountain ranges, such as the Nile Valley, Congo Delta and Great Lakes of the USA. The rain that falls on the mountains has a normal iodine content, but it is filtered out by the time it reaches the springs and streams of the highland valleys.

**Diet** Some vegetables contain chemicals which are goitrogens (i.e. they interfere with hormone synthesis). An excess dietary intake of the brassica family of...
Different forms of goitre

foods (e.g. cabbage, sprouts and kale) can cause a goitre.

Local symptoms The principal complaint is of a swelling in the neck. This appears slowly and without pain.

If it becomes large – especially if it remains as a colloid goitre after the initial stimulus has gone – it can cause pressure symptoms such as dyspnoea, venous engorgement and mild discomfort during swallowing.

General symptoms Diffuse hyperplastic goitres are not usually associated with clinically significant hyperfunction or hypofunction of the gland.

Long-standing colloid goitres often become nodular goitres and occasionally secondary thyrotoxicosis (Plummer’s syndrome) or myxoedema may develop.

Examination

Position The swelling occupies the anatomical site of the thyroid gland.

Tenderness It is not tender.

Shape The swelling usually follows the configuration of the gland and can be seen to have two lobes and an isthmus.

Size Physiological goitres are only two or three times larger than a normal gland, but iodine-deficiency goitres can become very large.

Surface The surface of a hyperplastic goitre is smooth. If it turns into a colloid goitre, its surface becomes bosselated and, in time, nodular.

Composition The gland feels firm and is dull to percussion. Hyperaemic physiological goitres may have a very soft systolic bruit.

Relations The gland moves upon swallowing. The other tissues in the neck should be normal.

Lymph glands The deep cervical lymph glands should not be palpable.

The eyes The eyes should be normal.

General examination The patient is usually euthyroid.

Multinodular goitre

Multinodular goitres develop spontaneously and in glands subjected to prolonged stimulation (i.e. hyperplastic glands). They can therefore be endemic (in iodine-deficient areas) or sporadic (occurring haphazardly).

A nodular goitre results from a disorganized response of the gland to stimulation, and contains areas of hyperplasia and hypoplasia, side by side.

The cut surface of a nodular goitre reveals nodules with haemorrhagic, necrotic centres, separated by normal tissue. The normal tissue contains normally active follicles; the nodules contain both hyperactive and degenerate, involuting, follicles.

When the nodules are hyperplastic the patient may develop secondary thyrotoxicosis.

In long-standing nodular goitres, most of the nodules are inactive and the quantity of normally active follicles may be so reduced that thyroid hormone production is inadequate and myxoedema develops.

History

Age In endemic areas, nodular goitres appear in early adult life (15–30 years). Sporadic nodular goitres appear later, between the ages of 25 and 40 years.

Sex Nodular goitres are six times more common in women than in men.
The neck

Geography These goitres are common in areas where the drinking water is deficient in iodine (see hyperplastic goitre).

Symptoms The commonest presenting symptom is an **enlarging, painless swelling** in the neck, which may cause **dyspnoea**, **discomfort when swallowing**, **stridor** and **engorged neck veins**.

Sudden enlargement and pain can occur if there is haemorrhage into a necrotic nodule. Necrotic nodules are not cysts, and it is wrong to call this event a haemorrhage into a cyst.

**Thyrotoxicosis** occurs in a significant proportion (maybe as high as 25 per cent) of patients with long-standing nodular goitres. The symptoms of thyrotoxicosis are listed on pages 299–300.

**Myxoedema**: as the follicular hyperplasia and its stimulation subside, the patient is left with a devas-tated gland that has little normal tissue. Ultimately, its endocrine secretions are inadequate and the patient has a considerable chance of becoming myxoedematous by the time they reach 60 or 70 years of age. The symptoms of myxoedema are described on pages 301–2.

**Examination**

Position The swelling is in the lower third of the neck in the anatomical site of the thyroid gland and is usually asymmetrical.

Tenderness A nodular goitre is only tender when there has been a recent haemorrhage into a nodule.

Shape and size The nodules are asymmetrical and the gland can become any shape. Nodules in the isthmus are prominent. The nodules may extend below the clavicles and the sternal notch, into the superior mediastinum.

Surface The surface of a nodular goitre is smooth but nodular. Frequently, only one nodule may be palpable, even though the rest of the gland is grossly diseased. This is termed a ‘dominant nodule’ and malignancy must be excluded.

Composition The consistence of the nodules varies: some feel hard, others feel soft. There is an old saying that ‘Solid lumps in the thyroid feel cystic, whereas cystic lumps feel solid’. The explanation is that a nodule composed of thyroid tissue is soft, whereas a nodule full of blood and liquefied necrotic tissue becomes tense and feels hard.

The nodules of a nodular goitre do not fluctuate, or transilluminate, and are dull to percussion.

There should be **no bruit** over the gland.

Relations The lump will **move upwards during swallowing**, indicating that it is fixed to the trachea. It should not be fixed to any other nearby structures.

Lymph drainage The cervical lymph glands should not be palpable.

State of local tissues The trachea may be **compressed** and/or **deviated**, depending on the site of the nodules. Bilateral nodules will compress the trachea into a narrow slit, causing dyspnoea and stridor – especially during lateral flexion of the neck. Large unilateral nodules will push the trachea laterally.

When the trachea is pushed to one side, the ‘keel’ of the **larynx is tilted away from the mid-line**.

If the gland is jammed in the thoracic inlet, it may obstruct and distend the jugular veins.

Rarely, the goitre is so large that it starts to cause pressure on the overlying skin, and on occasions may even start to ulcerate through.

The eyes The eyes should be normal. It is unusual to get neurological or eye changes with secondary thyrotoxicosis associated with a nodular goitre. These systems are affected more often in primary thyrotoxicosis.

General examination There may be the general signs of thyrotoxicosis – especially the cardiovascular signs or, in elderly patients with very long-standing nodular goitres, the signs of **myxoedema**.

### The solitary nodule

Although only one nodule may be palpable, **approximately one-half of the patients who present with a solitary nodule actually have a multinodular goitre, i.e. a clinically dominant nodule in a macroscopical multinodular goitre.**
It is unusual to be able to determine the pathology of a solitary nodule by clinical examination. Thus, although the majority of solitary nodules are benign, they must all be investigated, as many well-differentiated carcinomata of the thyroid present as solitary nodules. Fine-needle aspiration (FNA) to determine the cytology of the nodule has become part of the routine of clinical examination in many clinics.

Thyrotoxicosis caused by a solitary toxic/autonomous adenoma is uncommon and is never (well, hardly ever) caused by a solitary malignant nodule.

The causes of a solitary nodule in the thyroid gland are:
- dominant nodule in a multinodular goitre,
- haemorrhage into, or necrosis of, a hyperplastic nodule,
- adenoma,
- carcinoma (papillary or follicular),
- enlargement of the whole of one lobe by thyroiditis.

**THYROTOXICOSIS AND MYXEDEMA**
*(Hyperthyroidism and hypothyroidism)*

**Thyrotoxicosis**
Thyrotoxicosis is caused by an excess of circulating thyroid hormone. The gland may be diffusely hyperplastic (Graves’ thyroiditis), nodular, or the site of disease such as thyroiditis or an adenoma, but rarely a carcinoma.

The terms ‘primary’ and ‘secondary’ are used to describe thyrotoxicosis arising in a previously normal or previously abnormal gland, respectively. They can be confusing terms, but usually primary thyrotoxicosis (Graves’ disease) is caused by a form of autoimmune thyroiditis, whereas secondary thyrotoxicosis (Plummer’s syndrome) usually occurs in a longstanding multinodular goitre.

The thyroid hormones tri-iodothyronine (T3) and thyroxine (T4) have three effects.

1. They increase the metabolic rate of all cells.
2. They increase the sensitivity of beta-adrenergic receptors.
3. They stimulate all cells to grow, but the effect on growth is only significant before natural growth has finished.

The increased tissue metabolism causes an increased appetite, a decrease in weight and an increased heat production.

The increased adrenergic receptor sensitivity causes tachycardia, extrasystoles, atrial fibrillation, tremor and nervousness, and lid retraction and lid lag.

Stimulation of growth during childhood produces early maturation and a slight increase in the rate of growth.

In myxoedema (hypothyroidism), all of these symptoms are reversed. The lack of growth stimulation in a child causes dwarfism.

**History**

*Age* Primary thyrotoxicosis occurs most often in young women, between 15 and 45 years of age. Toxic autonomous nodules can occur at any age.

Secondary thyrotoxicosis (from a nodular goitre) occurs in middle age – between 45 and 65 years.

*Sex* Primary thyrotoxicosis is ten times more common in women than in men.

*Geography* Secondary thyrotoxicosis is more common in those areas where simple hyperplastic goitre (and nodular goiter) is endemic.

*Metabolic symptoms* The patient complains of a ravenous appetite, but in spite of eating excessively, tends to lose weight. Patients may also find that they always feel warm, and therefore like cold weather and dislike hot weather. There may be excessive sweating.

*Cardiovascular symptoms* The patient complains of palpitations, shortness of breath during exertion, missed and irregular heart beats (extrasystoles and atrial fibrillation) and tiredness. Cardiovascular symptoms are often the presenting symptoms of secondary thyrotoxicosis, whereas atrial fibrillation may be the only sign of thyrotoxicosis in an elderly patient.

*Neurological symptoms* Symptoms such as nervousness, irritability, insomnia, depression and excitement, even mania and melancholia, may be noticed by close relatives long before the patient is aware of them.

There may be hyperaesthesia, headaches, vertigo and tremors of the hands and tongue.

The patient may complain that their eyes have become more protuberant and that some eye movements are difficult.
The neck

Alimentary symptoms
The changes in appetite and weight have been mentioned under metabolic symptoms. There is often a slight change in bowel habit – usually mild diarrhoea.

Genital tract symptoms
Most women have a reduction in the quantity of their menses; some have amenorrhoea.

Musculoskeletal symptoms
In addition to generalized weight loss, there may be specific wasting and weakness of the small muscles of the hand, shoulder and face. These muscles rarely become completely paralysed.

Cause
Patients with primary thyrotoxicosis may relate the onset of their symptoms to puberty, pregnancy, an illness or a sudden emotional upset. Although it is difficult to be certain that events of this sort are the prime cause of hypersecretion of the thyroid gland, they undoubtedly exacerbate any hidden or developing abnormality. They are sometimes remembered as the three Ss – sex (puberty and pregnancy), sepsis and psyche!

Examination
Signs in the neck
The thyroid gland is usually enlarged, but thyrotoxicosis can be present without any enlargement of the gland.

A small goitre, nervousness and agitation, beginning to lose weight, left lid retraction and very early exophthalmos (sclera visible below right inferior limbus).

A large goitre, increasing appetite but weight loss – particularly of the face and shoulder girdle – no eye signs.

FIG 11.38 THE FACIES OF THYROTOXICOSIS.

A nodular goitre. No eye or nervous system signs, but palpitations, breathlessness and atrial fibrillation.

Alimentary symptoms The changes in appetite and weight have been mentioned under metabolic symptoms. There is often a slight change in bowel habit – usually mild diarrhoea.

Genital tract symptoms Most women have a reduction in the quantity of their menses; some have amenorrhoea.

Musculoskeletal symptoms In addition to generalized weight loss, there may be specific wasting and weakness of the small muscles of the hand, shoulder and face. These muscles rarely become completely paralysed.

Cause Patients with primary thyrotoxicosis may relate the onset of their symptoms to puberty, pregnancy, an illness or a sudden emotional upset. Although it is difficult to be certain that events of this sort are the prime cause of hypersecretion of the thyroid gland, they undoubtedly exacerbate any hidden or developing abnormality. They are sometimes remembered as the three Ss – sex (puberty and pregnancy), sepsis and psyche!
The enlargement may be diffuse, nodular or tender, depending on the local pathology. A diffusely enlarged hyperaemic gland usually has a *systolic bruit* audible over its lateral lobes.

**Signs in the eye**

Thyrotoxicosis is associated with four groups of physical signs in the eyes.

**LID RETRACTION AND LID LAG**

These are common signs. In lid retraction the upper eyelid crosses the eye above its usual level (mid-way between the pupil and the superior limbus of the iris) because the autonomic part of the levator palpebrae superioris muscle is hypertonic.

Ask the patient to follow your finger as you move it slowly from above downwards. If the upper eyelid does not keep pace with the eye, the patient has *lid lag*. This is also caused by the increased tone of the levator palpebrae superioris muscle.

The patient may blink less frequently than normal.

**EXOPHTHALMOS**

Oedema of the retro-orbital tissues pushes the eye forwards. The first abnormality is the appearance of sclera *below the inferior limbus*, but when the condition is extreme, the eye appears to be popping out and the eyelids cannot be completely closed.

Exophthalmos makes convergence difficult and allows the patient to look up without raising their eyebrows or wrinkling their forehead. Corneal ulceration may complicate severe exophthalmos.

**OPHTALMOPLEGIA**

Infiltration of the ocular muscles weakens the eye muscles and diminishes the eye movements. The muscles most often affected are the superior rectus and inferior oblique muscles. As these muscles normally turn the eye upwards and outwards, this is the first movement to become weak.

**CHEMOSIS**

This is oedema of the conjunctiva. The conjunctiva becomes thick, boggy and crinkled and may bulge over the eyelids. The eyes water excessively.

**General signs**

These are best described in bodily systems.

**METABOLIC SIGNS**

The patient looks thin and their face and hands may be particularly wasted. They may look hot and be sweating, even in a cold room.

**CARDIOVASCULAR SIGNS**

There is usually a *tachycardia* of 90 beats/minute or more at rest, which persists during sleep.

If there are *extrasystoles* or *atrial fibrillation*, the pulse will be irregular.

If there is mild heart failure, there may be râles at the bases of the lungs and oedema of the ankles.

**NEUROLOGICAL SIGNS**

The patient looks worried and nervous and moves about in an agitated, jerky way. They will often twist and twine a handkerchief between their fingers.

A *fine tremor* may be demonstrated when they stretch out their hands with their fingers spread. A similar tremor may be present in the protruded tongue.

**MUSCULOSKELETAL SIGNS**

The muscles of the hands, shoulders and face may be wasted and weak and the finger tips enlarged.

**SKIN**

In certain patients with Graves’ disease, red, blotchy, raised areas may be seen over the shins. This is termed *pretibial myxoedema* and is caused by deposits of myxoid tissue within the skin.

**Myxoedema**

**History**

Myxoedema is the clinical state which follows a severe lack of thyroid hormone (hypothyroidism). The term means ‘mucous swelling’ and is used because when it was first described it was believed that the increase in weight and body swelling was caused by a new form of oedema.

**Age** Myxoedema tends to occur in middle and old age.

**Sex** It is more common in women than in men.

**Metabolic symptoms** The patient complains of *tiredness* and *weakness*, which become intense physical and mental *lethargy*.

The patient always feels *cold*, and therefore *likes hot weather and dislikes cold weather*. They gain weight but have a poor appetite.
Breathlessness and ankle swelling indicate the onset of cardiac failure.

The patient finds it difficult to think and to speak quickly and clearly. Hallucinations, dementia (‘myxoedema madness’) and, in severe cases, ‘myxoedema coma’ can occur.

Progressive and obdurate constipation is common.

Menorrhagia is common when myxoedema occurs before the menopause.

The hands are cold and the finger tips blue.

The complexion of a white-skinned patient with myxoedema is said to resemble peaches and cream. The skin is smooth and has a pale-yellow (the cream) colour. The cheeks are often slightly flushed and have a pink-orange tinge (the peaches).

The skin is dry and inelastic and does not sweat. Although it may look oedematous, it does not pit after prolonged pressure.

The patient is overweight, with excess connective tissue and fat in the supraclavicular fossae, across the back of the neck and over the shoulders.

The hair looks thin and ragged and falls out.

The voice becomes deep and hoarse.

The pulse rate is slow (40–60 beats/minute) and the blood pressure is low. Both these changes may be reversed if heart failure develops.

The hands are cold and the finger tips blue.
Neurological signs Mental alertness and the ability to respond to questions and solve problems are noticeably retarded. Conversation is also hampered by the difficulty in articulation caused by enlargement of the tongue.

All movements are slow and deliberate.

The reflexes are sluggish and their relaxation period prolonged.

Cretinism

A cretin is a child whose mental and physical development has been retarded by a lack of thyroid hormone. Nowadays cretins are rare because the hormone deficiency can be replaced.

Cretinism is likely to occur in those places where goitre is endemic. The child may have a goitre.

The cretin has an underdeveloped skeleton (a dwarf) and a large protruding tongue, the eyes are wide apart, and the skull is also wide. The limbs and neck are short and the hands spade-like.

The skin is dry and there are supraclavicular pads of fat.

The abdomen is distended and protuberant and there is often an umbilical hernia.

There is mental retardation, even imbecility.

When hypothyroidism occurs in older children, they develop a mixture of the symptoms of cretinism and myxoedema.

CARCINOMA OF THE THYROID GLAND

The thyroid gland is a very vascular organ, and secondary tumour deposits from primary lesions in the breast, stomach, colon and lung are often found at autopsy. However, these secondary deposits rarely become large and noticeable and rarely present

<table>
<thead>
<tr>
<th>Hypothyroid</th>
<th>Euthyroid</th>
<th>Hyperthyroid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diffuse enlargement Thyroiditis</td>
<td>Iodine deficiency Enzyme defects Goitrogens</td>
<td>Primary hyperthyroidism (Graves’ disease)</td>
</tr>
<tr>
<td>Multinodular enlargement</td>
<td>Multinodular goitre with gross degeneration</td>
<td>Secondary hyperthyroidism (Plummer’s syndrome)</td>
</tr>
<tr>
<td>Solitary nodule</td>
<td>Coincidental nodule with myxoedema</td>
<td>Cyst Dominant nodule Adenoma Medullary carcinoma</td>
</tr>
<tr>
<td>No palpable goitre</td>
<td>Thyroiditis Primary myxoedema</td>
<td>Autonomous toxic nodule</td>
</tr>
<tr>
<td></td>
<td>Post-thyroidectomy or post-radioactive iodine</td>
<td>Normal gland</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Primary hyperthyroidism Thyroxine overdose</td>
</tr>
</tbody>
</table>
primarily as a thyroid swelling. The majority of the neoplasms in the thyroid gland that present as a lump in the neck are primary thyroid tumours.

There are three varieties of carcinoma of the thyroid follicles:

- papillary carcinoma
- follicular carcinoma
- anaplastic carcinoma.

The parafollicular (C) cells can also undergo malignant change, and this cancer is called:
- medullary carcinoma.

The lymphoid tissue in the gland can also undergo malignant change to become a lymphoma, but this is not a true thyroid tissue neoplasm. Lymphoma is more common in patients with Hashimoto’s disease.

**Papillary carcinoma**

This tumour contains a few formed follicles, but its bulk consists of hyperplastic follicular epithelium with a papilliferous configuration which sometimes produces a small quantity of colloid. This tumour spreads in the lymphatics. The cervical lymph glands may be palpable long before the primary lesion in the thyroid gland becomes palpable.

**History**

*Age* Papillary carcinoma is a tumour of children and young adults. Because it occurs in young children, the metastases in the lymph glands were once thought to be clusters of aberrant normal thyroid tissue. They are not. They are true metastases and may often be the presenting feature. Often these enlarged nodes can present as large cystic swellings and mimic a branchial cyst.

*Sex* Females are affected three to four times more often than males.

*Symptoms* The common presenting symptom is a lump in the neck. The lump may be in the region of the thyroid gland or, if it is caused by secondary deposits in the lymph glands, in the antero-lateral part of the neck.

Distant secondary deposits or a change in thyroid function are very uncommon with papillary carcinomata.

**Duration of symptoms** The lump may have been present for many years before the patient seeks advice, because these tumours are slow growing and slow to spread beyond the thyroid gland and its draining lymph glands.

**Cause** The patient will have no idea of the cause of the lump, but it is important to ask them if they have had any radiation to the neck or mediastinum. There is a greater incidence of papillary carcinoma in children who have had their neck or chest intentionally irradiated for conditions such as asthma, tuberculosis, enlargement of the thymus, tonsillitis and acne (a form of treatment no longer practised), and unintentionally following a nuclear reactor accident.

**Examination**

The principal, and usually the only, abnormality is the lump or lumps in the neck.

**Position** The lump may be in the region of the thyroid gland or deep to the sternomastoid muscle.

**Temperature and tenderness** The skin of the neck should be normal, provided the tumour has not infiltrated into it. The lumps are usually not tender.

**Shape and size** The primary nodule in the thyroid gland may vary in size from a minute, impalpable nodule to a nodule 3–5 cm in diameter. When palpable, it is usually spherical, smooth and clearly defined, but its surface may be bosselated.

Lymph glands containing thyroid carcinoma metastases are ovoid or nodular, and usually smooth and clearly defined. Occasionally they can be cystic, providing a diagnostic dilemma. The thyroid gland lymph first drains to the pretracheal and paratracheal lymph glands and then to the lower deep cervical lymph glands which lie beneath the anterior edge of the lower third of the sternomastoid muscle.

**Composition** The consistence of both the primary nodule and the secondary lymph glands is hard or firm. Both are dull to percussion, do not fluctuate and do not cause a bruit.

**Relations** The primary nodule in the thyroid gland will move upon swallowing and is not usually fixed to superficial structures.
Enlarged lymph glands move more easily in a transverse than in a vertical plane and do not move with swallowing. They are not usually attached to the skin.

**Lymph drainage** If you feel a nodule in the thyroid gland, examine all the lymph glands in the neck with care.

**General examination** The patient usually appears fit and well, without any of the systemic signs which suggest a disseminated neoplasm or thyroid dysfunction.

### Follicular carcinoma

The cells in this well-differentiated thyroid cancer retain their normal follicular configuration. Most of the follicles contain a small amount of colloid, which implies that the cells are synthesising hormone. This has an important bearing on treatment, because the tumour cells will often take up radioactive iodine. This tumour spreads by the bloodstream.

#### History

**Age** Follicular carcinomata occur in adults between the ages of 20 and 50 years.

**Sex** Women are affected more often than men.

**Symptoms** The common presenting symptom is a lump in the neck, which may have been present for many years.

If the tumour has spread beyond the thyroid, the patient may complain of breathlessness, chest pain or pain or swelling in a bone, caused by lung and bone metastases, respectively. In these circumstances the pathologist usually finds that the tumour has a thin capsule and has spread into the substance of the gland – the ‘invasive’ variety of follicular carcinoma.

**Multiple lumps in the neck** caused by metastases in lymph glands do occur, but not as frequently as with papillary carcinoma.

**Systemic effects** These patients are euthyroid.

### Examination

The principal, and often the only, abnormality is the lump in the neck.

**Position** Follicular carcinoma usually arises in one of the lateral lobes of the thyroid gland.

**Temperature and tenderness** The overlying skin is not hot and the lump is not tender.

**Shape and size** The lump is usually spherical and smooth, with distinct edges. Even the invasive variety feels as if it has a distinct surface.

**Composition** The lump is firm to hard, does not fluctuate, is dull to percussion and has no bruit.

**Relations** The lump moves with swallowing, but is not attached to overlying structures.

**Lymph glands** The deep cervical lymph glands may be enlarged and hard.

**Local tissues** The local tissues are usually normal.

#### General examination

Examine the chest carefully for any evidence of consolidation or collapse. Pulmonary secondary deposits are quite common but may not cause any abnormal physical signs.

Metastases in the skeleton are often painful and tender. A bone near to the skin containing a metastasis may be visibly deformed, swollen and hot. Some thyroid cancer metastases are so vascular that they are soft and pulsatile and have an audible bruit.

### Anaplastic carcinoma

This is the worst variety of thyroid cancer because it spreads rapidly. Most patients with this disease are dead within 1 year of diagnosis. Its cells do not synthesize thyroid hormone.

#### History

**Age** Anaplastic carcinoma of the thyroid gland appears between the ages of 60 and 80 years.
Sex  Females are affected more often than males.

Symptoms  The common complaint is a swelling of the neck rather than 'a lump', which may be rapidly growing. The patient complains of swelling because the tumour is diffuse and infiltrating, not localized. A dull aching pain in the neck is quite common. Dyspnoea occurs when the tumour begins to compress the trachea, especially when the neck is flexed. It may also occur if there are multiple pulmonary metastases.

Hoarseness or a change in the quality of the voice is a diagnostic symptom because it implies infiltration of the recurrent laryngeal nerve. Pain in the ear, caused by infiltration of the vagus nerve, is not uncommon. There may be bone pain. Any bone can be the site of a secondary deposit, and pathological fractures can occur. General malaise and weight loss appear when there is disseminated disease.

Duration of symptoms  The symptoms of an anaplastic carcinoma often develop rapidly as this carcinoma grows quickly and is highly invasive. Local invasion and compression of the trachea can lead to death from asphyxia or precipitate a fatal pneumonia.

Examination

Position  The swelling in the neck is in the region of the thyroid gland. At first this is in one lobe, but in advanced cases the whole gland may be enlarged and irregular.

Colour  The overlying skin often has a red-blue tinge because the underlying infiltration interferes with its venous drainage.

Temperature  The skin temperature is normal, or slightly raised.

Tenderness  The mass often becomes tender as the tumour infiltrates beyond the thyroid gland.

Shape  The mass in the neck has no definable shape once it has spread beyond the thyroid gland, and before this stage it is not easy to define because the surface is so indistinct.

Size  The mass may become so big that it interferes with neck movements.

Surface and edge  The surface is irregular and indistinct and the lump often has no palpable edge.

Composition  The mass is hard and solid. It does not fluctuate, is dull to percussion and has no bruit.

Relations  Provided the mass is not infiltrating the whole neck, it will move during swallowing.

It may be fixed to one or both sternomastoid muscles and the overlying skin as well as to the trachea. When the sternomastoid muscle is contracted, the movement of the lump during swallowing is limited and the skin becomes puckered.

The skin may be infiltrated with tumour, making it thick, nodular and a reddish-brown colour.

Lymph glands  Although the deep cervical lymph glands are invariably involved in the disease, their enlargement may be obscured by the primary mass in the gland.

If the local lymph glands are palpable, they feel hard and fixed. At first they are smooth and discrete, but they become irregular and indistinct when the tumour begins to spread through their capsules.
State of local tissues  The skin of the neck may be tethered or fixed to the lump or even infiltrated with tumour.

The trachea is often compressed and deviated, causing stridor.

One vocal cord may be paralysed by infiltration of the recurrent laryngeal nerve. This may be suspected if the patient has a hoarse voice, but must be confirmed by indirect laryngoscopy.

All the soft tissues of the neck may be fixed and hardened by infiltrating tumour.

General examination  Patients often breathe with difficulty and have stridor. There may be basal pneumonia or collapse caused by pulmonary secondary deposits or the restriction of lung expansion by the narrowed trachea.

There is often wasting and anaemia.

There may be evidence of skeletal metastases – even pathological fractures.

In advanced cases the liver may be enlarged, and secondary deposits occasionally appear in the skin.

Medullary carcinoma

This is a rare condition but is mentioned because it can sometimes be diagnosed before operation. It is a neoplasm of the parafollicular (C) cells.

The common presentation is a firm, smooth and distinct lump in the neck, indistinguishable from any other form of thyroid solitary nodule.

The majority of patients are between the ages of 50 and 70 years when the tumour is sporadic in nature. When the condition occurs in young adults (20–30 years), often with a family history, it may be a manifestation of the multiple endocrine neoplasia syndrome (MEN) types 2a or 2b.

In these cases, the medullary thyroid carcinoma may be accompanied by associated conditions such as:

- phaeochromocytoma  
- parathyroid tumours  

or

- phaeochromocytoma  
- neuromata of the tongue, lips and conjunctiva  
- pale-brown birthmarks  
- megacolon  
- marfanoid habitus.

The symptoms which should make you think of medullary tumour, apart from a lump in the neck and the presence of the above lesions in the patient or their family, are diarrhoea and flushing. Diarrhoea occurs in one-third of the patients. The fluidity of the stool and the frequency of defaecation are both increased.

If this tumour is suspected, it is important to measure the serum calcitonin level.

THYROIDITIS

There are three varieties of thyroiditis which can be diagnosed clinically: Hashimoto's disease, de Quervain's thyroiditis and Riedel's thyroiditis.

The term thyroiditis is a non-specific description of the histological changes occurring in the gland. Although the aetiology of these conditions is only partly understood, the eponyms are useful because they do not imply an aetiology but rather a clinical description (provided you ignore the aetiologies proposed by the three gentlemen who made the original descriptions!).

Hashimoto's disease

This is an autoimmune thyroiditis. The body fails to recognize part of itself – in this case both the mitochondria of the thyroid cells and the thyroglobulin they produce – and sets up an immune response against its own tissues. The result is lymphocyte and

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FIG 11.43 Tongue neuromata in a patient with MEN 2b and medullary carcinoma of the thyroid.
plasma cell infiltration of the gland that ultimately destroys the thyroid cells. In the first instance the thyroid cells respond by becoming hyperplastic, causing a degree of thyrotoxicosis, but eventually and inevitably the gradual destruction of the thyroid cells causes myxoedema (hypothyroidism).

**History**

**Age and sex** Hashimoto’s disease is most common in middle-aged women, especially those near the menopause; but it can occur in men, and at any age.

**Symptoms in the neck** The patient usually complains of a swelling or lump in the neck. This lump may appear gradually or rapidly, and is often painful, particularly when it appears rapidly.

The swelling, or lump, fluctuates in size, and the pain is often intermittent. The symptoms are worse when the patient is tired, or run down, or has an intercurrent illness.

The voice should not alter.

**Systemic effects** The symptoms of mild thyrotoxicosis or myxoedema may be present.

The common course of events is for the mild symptoms of thyrotoxicosis, which appear at the onset of the disease, to die out gradually and become replaced by the opposite symptoms of myxoedema.

The majority of patients are euthyroid when they complain of the lump, having ignored or not had any symptoms of thyrotoxicosis, and not reached the myxoedematous phase.

This variability of the local and systemic effects of the disease makes the diagnosis difficult.

**Family history** Other members of the family may have suffered from the same or other forms of autoimmune disease, such as pernicious anaemia and autoimmune gastritis.

**Examination**

The main complaint is usually the lump in the neck.

**Position** The swelling is in the region of the thyroid gland and may be unilateral or bilateral.

**Temperature** In the initial acute phase – if it occurs – the overlying skin may feel warm.

**Tenderness** The swelling is often slightly tender.

**Shape** The swelling may be any shape – a solitary nodule, the whole of one lobe, or the whole gland.

When one lobe or more is involved, the swelling is usually lobulated.

**Size** Hashimoto’s disease usually causes a moderate swelling of the gland, easily visible but rarely gross.

**Surface** The swelling has a smooth surface and the edge is distinct.

**Composition** The swelling has the texture of firm rubber. This texture is homogeneous, in spite of the lobulated shape, which helps distinguish the swelling from a nodular or colloid goitre.

There is no bruit.

The composition and mild tenderness are the features most likely to alert you to the possibility of the diagnosis.

**Relations** The swelling moves with swallowing but is not fixed to any other structures.

**Local tissues** All the local tissues should be normal.

**Lymph glands** The nearby lymph glands should not be enlarged.

**General examination** The majority of patients are euthyroid, but some will have the signs of mild thyrotoxicosis and others of early myxoedema.

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**De Quervain’s thyroiditis**

This condition is a true subacute inflammation of the thyroid gland, often associated with mild hyperthyroidism. It may be caused by a virus infection, and sometimes occurs in epidemics.

**History**

De Quervain’s thyroiditis occurs in adults. The main complaint is of the sudden appearance of a painful swelling in the neck. The patient feels ill and may notice that they are anxious, sweaty and hungry and have palpitations.

**Examination**

Examination reveals a diffuse, firm, tender swelling of the whole of the thyroid gland.

There may be signs of mild thyrotoxicosis – nervousness and agitation, lid lag and tachycardia.

De Quervain’s thyroiditis is self-limiting. It disappears in 1–3 months.
Riedel’s thyroiditis

This is a very rare condition but is mentioned because the changes in the gland can be mistaken for the signs of a carcinoma.

It is a condition in which the gland is gradually replaced by dense fibrous tissue, which may even infiltrate beyond the gland into the nearby strap muscles.

The patient complains of a lump in the neck or, very rarely, increasing dyspnoea caused by compression of the trachea.

Examination reveals a stony hard swelling of the thyroid gland, at first of one lobe, but eventually of both lobes and the isthmus.

The lump moves with swallowing but may be fixed to the surrounding tissues, which are otherwise normal.

When both lobes are involved, the smooth, discrete surface usually excludes the diagnosis of carcinoma, but when one lobe is involved it is impossible to make a firm clinical diagnosis.

Note

A scheme for diagnosing thyroid swellings is shown in Figure 11.44 on pages 310–11.
A SCHEME FOR THE DIAGNOSIS OF THYROID SWELLINGS

Once you have examined the patient you should be able to draw conclusions as to the nature and texture of the gland and as to its endocrine activity.

The gland
1. Solitary palpable nodule
2. Multinodular goitre
3. Diffusely enlarged gland

Activity of the gland
1. Normal (euthyroid)
2. Hypersecretion (hyperthyroidism/thyrotoxicosis)
3. Hypossecretion (hypothyroidism/myxoedema)

Having established the configuration of the gland and its endocrine activity, a table can be drawn up as to possible differential diagnoses (see Revision panel 11.8 on page 303). This allows a degree of clarity in interpreting the presenting clinical features and in arriving at a working diagnosis.

If only one lump is palpable it may be:

- The only palpable nodule of a multinodular goitre
- A cyst
- A benign adenoma
- Carcinoma (papillary, follicular or medullary).
  The lymph glands may be palpable, especially with the papillary type

FIG 11.44
If more than one lump is palpable the swelling may be:

- The whole of one lobe involved by Hashimoto's thyroiditis
- A multinodular goitre
- An anaplastic carcinoma especially if the voice is hoarse and the mass is fixed to the surrounding tissues

If there is diffuse, homogeneous enlargement of the whole gland the swelling may be:

- Grave's disease. Primary thyrotoxicosis. Slight to moderate enlargement. Soft, smooth with a bruit
- Hyperplastic (colloid) goitre. Moderate to gross enlargement. Bosselated. No bruit
- Thyroiditis. Hashimoto's, de Quervain's or Riedel's. Moderate or small. Hard, tender
- Multifocal carcinoma