Management of a lump in the neck

Nicholas J Roland, John Fenton, Rajiv K Bhalla

This article reviews the management of adults who present with a neck lump, and discusses the potential causes and relevant investigations. The review emphasizes the avoidance of open biopsy and need for early referral to the appropriate specialist.

The old surgical aphorism: 'consider the anatomical structures and then the pathology that can arise from these' is never more appropriate than when one contemplates the causes of a lump in the neck. However, one of the most important considerations in an adult presenting with a neck lump is that the mass may represent a metastatic deposit from a primary cancer. Although the adverse effects of incisional or excisional biopsy are well documented in the literature, its practice regrettably still continues.

CLASSIFICATION

It is difficult to present an exhaustive list of the potential causes, but a simple classification is illustrated in *Table 1*.

Neoplastic cervical lymphadenopathy

The incidence of neoplastic cervical lymphadenopathy increases with age and approximately 75% of lateral neck masses in patients older than 40 years are caused by malignant tumours. In the Liverpool series we found that 74% of enlarged cervical nodes had developed from head and neck primary sites and only 11% had come from primary sites outside that region (Jones et al, 1993). Thorough examination of the upper aerodigestive tract (to include the oral cavity, postnasal space, pharynx and larynx) and the thyroid gland is therefore mandatory.

Primary of unknown origin

This is a term applied to patients with a metastatic carcinoma in cervical lymph nodes with an occult primary. A careful search will usually reveal the primary tumour in the skin or mucosal surfaces of the head and neck, or rarely, in an area below the clavicles, such as the lungs. It is important to thoroughly search for the primary tumour by all available diagnostic methods including history, physical examination, imaging, panendoscopy and selective biopsies from high risk sites (nasopharynx, ipsilateral tonsil excision, base of tongue and piriform fossa). In approximately 3–11% of cases the primary tumour remains elusive and it is these that the term 'primary of unknown origin' should be reserved. The prognosis varies from a 30–70% 5-year survival. The prognosis depends on N stage (node status) and position of the node.

Mr Nicholas J Roland is Consultant and Honorary Lecturer, **Mr John Fenton** is Senior Lecturer and Consultant and **Dr Rajiv K Bhalla** is Research Registrar in the Department of Otolaryngology and Head and Neck Surgery, University Hospital Aintree, Liverpool L9 7AL

Correspondence to: Mr NJ Roland

TABLE 1. Causes of neck lumps

Congenital	Lymphangiomas
	Dermoids
	Thyroglossal cysts
Developmental	Branchial cysts
	Laryngoceles
	Pharyngeal pouches
Skin and subcutaneous tissue	Sebaceous cyst
	Lipoma
Tumours of the parapharyngeal space	Deep lobe parotid
	Chemodectoma
Thyroid swellings	Multinodular goitre
	Solitary thyroid nodule
Salivary gland tumours	Pleomorphic adenoma
	Warthin's tumour
Reactive neck lymphadenopathy	Tonsillitis
	Glandular fever
	Human immunodeficiency virus
Malignant neck node	Carcinoma metastases (unknown primary)
	Lymphoma

Supraclavicular nodes have the worst prognosis, probably because many of these represent distant metastases from non-head and neck sites (e.g. lung or stomach). Patients who have a neck dissection and radiation therapy to both sides of the neck and the mucosal surfaces have better neck and local control than those who do not have such extensive treatment. However, this does not seem to translate into prolonged survival. Chemotherapy may have a place in improving this situation.

Dermoid cysts

Dermoid cysts are midline swellings that do not move with swallowing or tongue protrusion.

Thyroglossal cysts

These form along the tract of the obliterated thyroglossal duct. They move with swallowing and tongue protrusion as they are ultimately attached on their deep aspect to the larynx. Thyroglossal cysts should not be incised and drained as this may cause an ugly sinus that is difficult to excise in toto and in continuity with the deflated cyst. They should be excised with the body of the hyoid bone (Sistrunks procedure). There is a high risk of recurrence if only the cyst is excised, as a tract going behind, in front, or through the hyoid bone may be left behind.

Branchial cysts

Branchial cysts arise from elements of squamous epithelium within a lymph node. They usually present in young adults, 60% on the left and 60% in males. Most arise along the line of the deep cervical lymph nodes, the anterior border of sternomastoid, at the junction of its upper and lower two thirds. In a patient over the age of 40 years it is mandatory to exclude a potential metastatic cystic lymph node before considering excision (Flannagan et al, 1994). Failure to recognize this is a common error.

Lymphangiomas

Lymphangiomas can be simple (thin walled channels), cavernous (dilated lymphatic spaces) or a cystic hygroma (cysts of varying sizes). Simple and cavernous lesions arise principally in the lips, cheek and floor of the mouth. Cystic hygromas usually arise in the lower neck. Treatment is by surgical excision. Injection of sclerosants and radiotherapy have been suggested, but are not recommended.

Pharyngeal pouches

These are most frequently seen in the elderly. They cause a sensation of a lump in the throat, long-standing dysphagia, regurgitation of undigested food, halitosis, weight loss and recurrent chest infections as a result of aspiration. Hoarseness is unusual, but may occur as a result of irritation of the vocal cords from repeated aspiration, or more rarely as a result of involvement of the recurrent laryngeal nerve by a carcinoma arising in the pouch. Approximately 0.5–1% of all pouches have an invasive squamous cell carcinoma in their wall. Swelling in the neck may be present and is nearly always on the left side. It may gurgle on palpation and empty on external pressure. After the diagnosis is established, patients are usually treated by endoscopic stapling. The surgeon must be prepared to open the neck and repair the pharynx if stapling is not possible or a perforation occurs.

Laryngoceles

Laryngoceles usually occur in men with a mean age of 55 years. They arise from the laryngeal saccule, expanding internally to present in the vallecula or externally through the thyrohyoid membrane. They are occasionally associated with a ventricular carcinoma.

An intermittent neck swelling is the usual presentation, perhaps with hoarseness, cough or pain. It is usually impalpable but may become both visible and palpable on performing the Valsalva manoeuvre. It may obstruct the larynx, so the safest treatment is excision, which includes the upper half of thyroid cartilage on the side of the laryngocele so that its neck can be ligated.

Thyroid lumps

These often occur as a result of nodular goitre. A solitary thyroid nodule may represent a nodule from a multinodular goitre, an adenoma or a carcinoma. Papillary carcinoma can be multifocal. Clinical assessment will reveal a lump that is in the thyroid gland position and moves on swallowing. The patient's thyroid status (e.g. euthyroid), retrosternal extension, vocal cord mobility and the presence of any cervical nodes should all be documented.

Salivary gland lesions

Salivary gland lesions tend to emanate from the parotid or submandibular gland. The position of the lump, intra-oral examination of the salivary duct (with bimanual palpation), and facial nerve function should all be assessed. The neck should always be examined for nodes. Eighty per cent of all salivary tumours are benign, 80% occur in the parotid, and 80% are pleomorphic adenoma. Facial paralysis and neck nodes would suggest a possible adenoid cystic carcinoma.

ANATOMY

Neck lumps should always be described first in respect of their anatomical position. The neck is conventionally divided into anatomical triangles. The anterior triangle is bounded by the midline, the body of the mandible and the sternocleidomastoid muscle. The posterior triangle by the posterior border of the sternocleidomastoid muscle, the clavicle and the anterior border of the trapezius muscle (*Figure 1*). The anterior neck contains the laryngeal skeleton — hyoid bone, thyroid cartilage and cricoid cartilage. The thyroid prominence (Adam's apple) is usually easily palpable and a good reference point.

The position of lymph nodes involved in metastatic carcinoma is defined further by their decription in a particular level (*Figure 2*). The level of a lymph node has been shown to be of prognostic relevance (Jones et al, 1994). The following definitions are recommended for the boundaries of cervical lymph node groups:

Level I
Consists of the submental and submandibular lymph nodes within the triangle bounded by the anterior belly of the digastric, the hyoid bone, the posterior belly of digastric and the body of the mandible.

Level II (upper deep cervical)
Consists of lymph nodes located around the upper third of the internal jugular vein and adjacent spinal accessory nerve extending from the level of the carotid bifurcation to the skull base. There is a recent recommendation to further subdivide this level into the area anterior to the accessory nerve (level IIa) and that posterior to the nerve (level IIb).

Level III (mid deep cervical)
Consists of lymph nodes around the middle third of the internal jugular vein extending from the carotid bifurcation superiorly to the cricothyroid notch inferiorly.

Level IV (lower deep cervical)
Consists of lymph nodes located around the lower third of the internal jugular vein extending from the cricothyroid notch to the clavicle inferiorly.

Level V
Consists of the posterior triangle nodes which are located between the posterior border of the sternomastoid muscle and the anterior border of trapezius. The supraclavicular nodes are also included in this group.

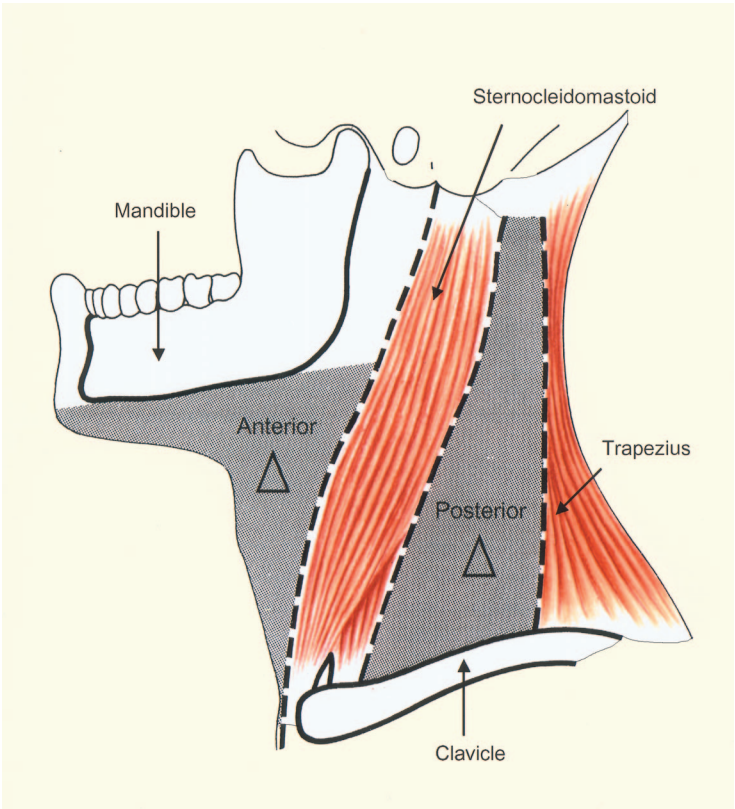

Figure 1. Anatomical triangles in the neck.

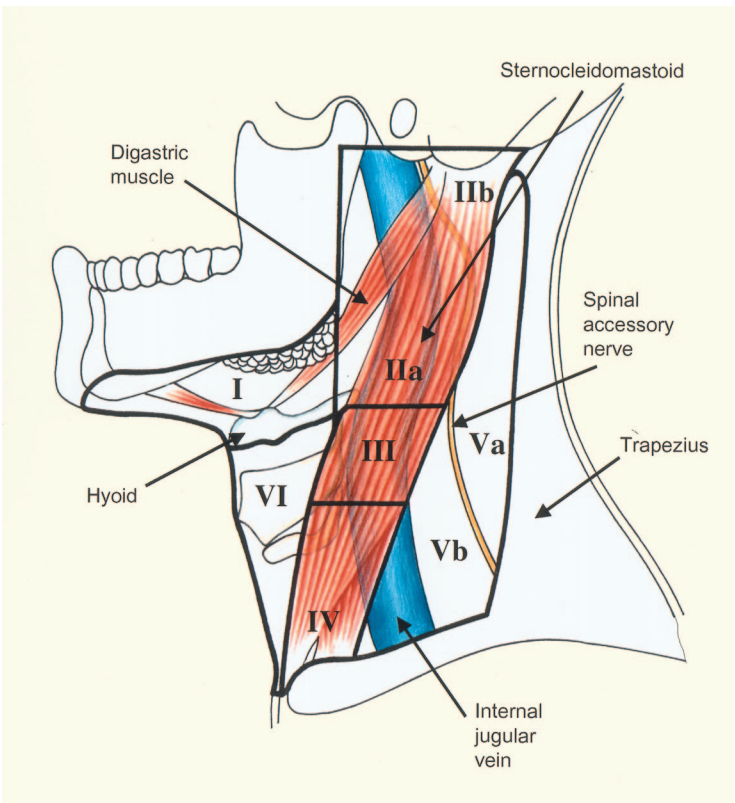

Figure 2. Lymph node levels in the neck.

Level VI
Anterior compartment.

REACHING A DIAGNOSIS

The diagnosis is from the history, examination and investigations including endoscopy, radiology and laboratory tests.

Symptoms of sore throat or upper respiratory tract infection may suggest an inflammatory cervical lymphadenopathy. Persistent hoarseness of voice, sore throat, pain on swallowing, cough or the sensation of a lump in the throat are risk symptoms of an upper aerodigestive tract malignancy. The symptoms are particularly relevant in patients who are over the age of 40 years and smoke cigarettes.

The anatomical position of the lump should be considered in context with the cervical viscera (e.g. parotid, thyroid gland, lymph nodes) that may be affected. The diagnosis is sometimes obvious from this evaluation, but it is dangerous to act impulsively on this limited information without establishing the diagnosis with relevant investigations. The patient should be referred promptly to an otolaryngologist who can examine the neck and upper aerodigestive tract. The specific investigations will then be dictated by the differential diagnosis.

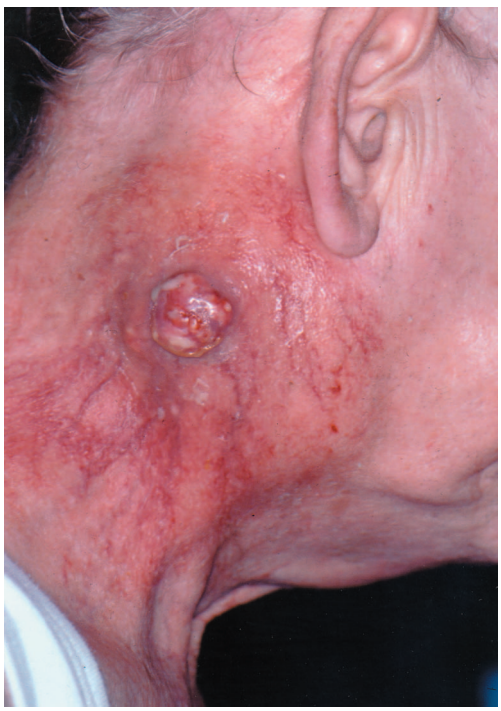

Figure 3. A fungating neck lump. This patient had excision of a cystic neck lump that was subsequently discovered to be a squamous cell carcinoma. The patient was treated with postoperative radiotherapy. However, the disease recurred with typical fungation into the skin of the neck. Subsequent investigation confirmed a primary tumour in the ipsilateral tonsil and treatment necessitated a combined oro-mandibular resection, radical neck dissection, wide excision of the involved skin and reconstruction.

INVESTIGATIONS

Open biopsy

The adverse effects of excisional or incisional biopsy as a primary diagnostic manoeuvre in the management of a neck lump are well documented in the literature. If the lump turns out to be a metastatic node from a squamous cell carcinoma then harm has been done to the patient. Open biopsy of a metastatic node, advanced age, and nodal stage all have an adverse effect on survival (Jones et al, 1993; Janot et al, 1996). Open biopsy also makes subsequent examination of the neck more difficult, encourages fungation (*Figure 3*), increases the risk of subsequent recurrence in the neck, and entails an unnecessary hospital admission and general anaesthetic for the patient (McGuirt and McCabe, 1978; Gooder and Palmer, 1984; Birchall et al, 1991).

The dangers of performing an incisional or excisional biopsy (enucleation) in parotid tumours are now well known. In these circumstances the wound is inevitably seeded and recurrence is likely. Recurrent disease may present late, involve the facial nerve, may become malignant and is exceptionally difficult to manage (Jackson et al, 1993).

There are occasions when fine needle aspiration cytology (FNAC) and other investigations have failed to confirm the diagnosis, or have indicated a lesion whereupon excision or incision biopsy is required (e.g. suspected lymphoma, benign neck lump). However, it is recommended that this conclusion be reached after the patient has been examined by an otolaryngologist and undergone at least a diagnostic FNAC.

Fine needle aspiration cytology

The role of FNAC has been extensively evaluated. It offers an accurate, sensitive, inexpensive and rapid method for evaluation of a neck lump. Its use has been recommended in parotid lesions (Roland et al, 1994), thyroid disease and just about every other type of head and neck lump (Caslin et al, 1994). Immediate procurement in the clinic is possible and has the advantage of allowing the cytologist to repeat the procedure if an inadequate specimen is aspirated. In addition, it enables the clinician to inform the patient of the diagnosis, order other relevant investigations and make early management plans (Caslin et al, 1994; Eisele et al, 1992). For patients with poorly defined or deep-seated lesions, image or

ultrasound guidance can be used (Righi et al, 1997; Sack et al, 1998).

FNAC is probably the single most useful diagnostic procedure if a neoplastic lymph node is suspected. False-negative and — very rarely — false-positive results can occur with FNAC, so the information must always be used in conjunction with the clinical findings. Direct liaison between the clinician and cytologist is important. It has been said that FNAC is as accurate and reliable as the combined judgment of the clinician and cytologist. When there is diagnostic doubt, clinical judgment should always prevail. In a few cases an open biopsy may be the only method to determine the diagnosis.

Radiology

An ultrasound scan (with ultrasound-guided FNAC) may delineate impalpable nodes. Ultrasound scanning (with ultrasound-guided FNAC) is the investigation of choice to define a thyroid nodule(s) position and nature.

Magnetic resonance imaging (MRI) may confirm the exact site and extent of a head and neck primary tumour. An MRI scan may also delineate impalpable nodes. The scans can also reveal the integrity or involvement of the vasculature by a metastatic lymph node. In addition, an MRI scan is useful to identify the position and assess the size and vascularity of a carotid body tumour (a digital subtraction angiogram will allow precise delineation).

A chest radiograph may show a primary carcinoma or evidence of secondary spread, as well as pulmonary tuberculosis or mediastinal gland enlargement.

A barium swallow is useful in cases of susupected pharyngeal pouch and may illustrate a carcinoma of the hypopharynx or cervical oesophagus.

For thyroglossal cysts many experts recommend a ^{99m}Tc or radioactive iodine (^{131}I) uptake scan before excision, although an ultrasound scan is less invasive, will delineate the cyst and will allow confirmation of whether there is a normal gland present.

Plain anteroposterior and lateral neck radiographs may show an air-filled sac (laryngocele).

Positron emission tomography is thought by some to have a place in the investigation of patients who have a primary of unknown origin.

Laboratory tests

These have little role to play, but a full blood count may reveal a blood dyscrasia or high white cell count consistent with an infective cause of the lump. A raised erythrocyte sedimentation rate may occur in cases of inflammation, sarcoid, or disseminated neoplasia. Human immunodeficiency virus testing may be appropriate depending on the circumstances and index of suspicion.

CONCLUSION

There are many causes of a neck lump in an adult, but their management is dictated by the fact that a significant proportion may represent metastatic cervical lymphadenopathy. Upper aerodigestive tract examination and fine needle aspiration biopsy are mandatory. Early referral to a surgeon with a specialist interest is advisable. Excisional or incisional biopsy is inadvisable and may be detrimental to the patient's care. HM

Conflict of interest: none.

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KEY POINTS

- A neck lump in an adult should be considered to be a metastatic node until proven otherwise.
- Examination of the upper aerodigestive tract by an ear, nose and throat surgeon should be carried out in all cases.
- Fine needle aspiration cytology is an inexpensive, safe and accurate investigation.
- Open excision or incisional biopsy of a neck lump should not be performed unless other investigations have failed to reveal the diagnosis.