Chapter 85: Differential Diagnosis of Neck Masses

W. Frederick McGuirt

The differential diagnosis of a neck mass covers a broad spectrum of diseases and carries implications for treatment as varied as any area of medicine (Table 85-1). All possible diagnoses and means of differentiating them are too numerous for a chapter of this length. Thus a flow-sheet approach is used to help the otolaryngologist-head and neck surgeon make the most logical diagnosis and consider viable options in the management of each problem (Fig. 85-1)

General Considerations

When examining a patient with a neck mass, the physician's first consideration should be the patient's *age group:* pediatric (up to 15 years), young adult (16 to 40 years), or late adult (over 40 years). Within each group the incidence of congenital, inflammatory, and neoplastic disease must be considered because most neck masses fit into one of these three categories. Pediatric patients generally exhibit inflammatory more frequently than congenital neck masses and developmental more than neoplastic masses; this incidence is similar to that found in younger adults. In contrast the first consideration in older adults should always be neoplasia, with less emphasis on inflammatory masses and even less on congenital masses.

After age, with its appropriate pathologic grouping, the next consideration should be *location* of the neck mass (Fig. 85-2). This is particularly important in the differentiation of congenital and developmental masses because they usually occur in consistent locations. The locations of neoplasms are both diagnostically and prognostically significant. The spread of head and neck carcinoma is similar to inflammatory disease, generally following an orderly lymphatic spread. The appearance of a metastatic neck mass thus may be the key to identifying the primary tumor or source of infection.

Other than recognizing these general background considerations, the physician must evaluate each patient. Specific historic aspects and physical findings that could reduce the possible causes should be sought so that only a limited number of diagnostic tests are needed for differential diagnosis.

Diagnosis

Physical examination

The most important diagnostic step is the physical examination of the head and neck, and visualization and palpation are the most important components of that examination. These help determine the location of the mass according to anatomic lymphatic drainage areas or developmental areas, the size of the lesion and its relationship (fixation or displacement) to surrounding structures, the consistency of the mass, and the presence of any pulsations or thrills. Listening for bruits or detecting the distinct odor of wet kerating and necrotic tumor on the breath also is important.

The physician must not be distracted by the mass and neglect to make a thorough head and neck evaluation. With the aid of a bright light source, the otolaryngologist should perorm mirror examination of all mucosal surfaces of the upper aerodigestive tract. These areas should be palpated, even when no lesion can be seen, particularly the primary sites for lymphatic drainage to the area of the mass in question (Fig. 85-3). A systemic investigation of all mucosal and submucosal areas is often central to diagnosing the etiology of neck masses. The capability to perform this examination is what distinguishes the otolaryngologist as the specialist for head and neck disease.

Tests

Often, however, even the most thorough physical examination merely gives the physician a general grouping, such as vascular, salivary or nodal, inflammatory, congenital, or neoplastic, and not a firm diagnosis. At this point various tests may be helpful (Table 85-2).

For a patient whose mass is pulsatile or compressible or who has a bruit or thrill, angiographic or ultrasonographic tests may be ordered to differentiate degenerative vascular problems such as aneurysms from neoplastic conditions such as glomus and carotid body tumors. Ultrasonography also may help differentiate a solid mass from a cystic mass or congenital branchial cysts and thyroglossal cysts from solid lymph nodes, neurogenic tumors, and ectopic thyroid tissue (Blei et al, 1977). The accuracy of differentiating solid, complex, and cystic lesions with ultrasound ranges from 90% to 95% (Hassani and Bard, 1978; Walfish et al, 1976) when both A-mode and B-mode scans are used.

For lesions in the areas of the salivary glands, radionuclide scanning, sialography, and ultrasonography are all of value (Odette et al, 1977). The radionuclide scan or the sialogram usually localizes the mass inside or outside the salivary gland and thus determines whether it has a glandular origin. Similarly the radionuclide scan shows whether the mass has functioning or nonfunctioning tissue.

In general, plain radiographs aid little in differentiating masses in the neck. Computed tomography (CT) of the neck is the most helpful test: it may differentiate solid masses from cystic masses, locate a mass within a glandular structure or identify it as a free nodal lesion, and differentiate congenital vascular lesions from the lymph nodal chain. However, CT remains expensive, and clinical judgment combined with the use of needle biopsy should make the use of CT infrequent as a purely diagnostic evaluation. Magnetic resonance imaging (MRI) is often useful to identify submucosal disease on T2-weighted images, especially in the nasopharynx and tongue base. The use of neck coils is correcting many of the motion artifacts associated with early MRI experience.

The use of all these tests does not give a definitive diagnosis, except for the vascular tumor. Thus it is important not to become reliant on these tests, since most diagnoses must wait for surgical specimens. However, or the patient whose diagnosis after examination and testing remains uncertain but who is suspected of having inflammatory adenopathy, a trial of antibiotic therapy and observation, not to exceed 2 weeks, is acceptable as a clinical test.

Lymphadenitis occurs in nearly every person at some point in life, especially during the first decade. Lymphadenopathy, caused by *bacterial* or *viral* infections of the upper respiratory tract, is so common that it is an expected sign. The source of the reactive lymphadenopathy usually is identified easily by reviewing the source of drainage to the nodal area in question (see Fig. 85-3) and using specific culture and sensitivity tests to determine the preferred antibiotic treatment. The physician waiting for test results should administer penicillin as the antibiotic of choice to cover most head and neck pathogenic organisms.

Granulomatous inlammatory disease afects rather specific age-groups and locations; the physician should remember this when evaluating the patient with a neck mass (Table 85-3).

If the mass in question persists or increases in size after a trial course of antibiotics, additional investigation is necessary. Serologic or skin tests for fungal disease frequently are not helpful but should be considered when the history or a physical finding warrants their use.

Excisional biopsy with pathologic examination and culture often is the final diagnostic test of preference. Biopsy only should be done, however, after the physician has done a complete head and neck examination using indirect, direct, endoscopic, and radiographic methods. This is necessary especially for adults, for reasons discussed later in this chapter.

Unknown Neck Mass Workup Protocol

If the history, physical examination, and routine diagnostic tests do not lead to a definitive diagnosis, any unknown neck mass, particularly a unilateral, asymptomatic mass corresponding to the location of known lymph node groups, must be considered a metastatic neoplastic lesion until proved otherwise.

Endoscopy and guided biopsy

The search for the primary lesion must include a second, thorough examination of the oral cavity, nasopharynx, hypopharynx, larynx, thyroid, salivary glands, and skin of the scalp and face (Table 85-4). Chest radiographs and barium radiographs of the upper digestive tract frequently are obtained but usually help little in differentiating neck masses found in locations other than the supraclavicular region. If the etiology of the mass remains elusive, the aerodigestive tract should be examined endoscopically, especially the area from which primary lymphatic drainage to the mass occurs (see Fig. 85-3). An obvious lesion should be biopsied; when no lesion is seen or palpated, *guided* (not "blind") biopsies in the most logical areas of the silent primary tumor, based on known lymphatic drainage, should be done. These areas usually are the nasopharynx around Rosenmüller's fossa, the tonsil (in this case a tonsillectomy replaces an incisional biopsy), the base of the tongue, and the pyriform sinus. The rationale for the guided biopsy when an obvious lesion is not present is that the primary tumor is often submucosal or arises deep in the cryptes of the palatine tonsil or the folds of the lingual lymphoid tissue.

Open excisional biopsy

If none of the measures just listed helps in diagnosis of the source responsible for the neck mass, open excisional biopsy of the mass is the next step. When this is performed, immediate diagnosis of the frozen section should be obtained and further therapeutic decisions must be made (see Table 85-4). Specifically, if the diagnosis is squamous cell (epidermoid) carcinoma or melanoma, a radical neck dissection should be performed; this requires extensive preoperative counseling and the patient's permission to proceed.

Fine-needle aspiration biopsy

A fine-needle aspiration biopsy is frequently performed before endoscopy. The technique of obtaining multiple aspirations with a No. 25-gauge needle is the recommended technique. Experience in collection and slide preparation is needed to guarantee maximal information. The services of a highly skilled cytopathologist are also needed.

Fine-needle aspiration biopsy has become standard for making treatmetn decisions on anterior compartment thyroid nodules and in confirming the clinical diagnosis of a cystic lesion.

These biopsies are also useful in the patient with a known distant malignancy in whom confirmation of metastases is needed for staging and for planning therapy, and in the patient with a head and neck primary tumor who is not a candidate for surgery but for whom the physician needs to make a tissue diagnosis in order to initiate nonsurgical therapy.

Fine-needle aspiration biopsy is also quite helpful in the overly anxious patient for whom the clinical index of suspicion for a neoplasm is low and the head and neck examination workup is negative, and whose physician wishes to prevent an open biopsy or hospitalization. A negative needle biopsy may allay the patient's fear of cancer and allow the physician time to follow the mass more confidently.

In the adult patient, especially one who is a chronic used of tobacco, alcohol, or both, and has a solid neck mass but no obvious primary head and neck mucosal tumor, the fine-needle aspiration biopsy is less definitive. In this group, a negative needle biopsy still requires endoscopy and open biopsy for confirmation because the index of suspicion is high; also a positive needle biopsy with a negative examination for a primary source of the metastatic mass still dictates that panendoscopy be used to detect the primary site, an open biopsy be used for confirmation of the nodal diagnosis, and a radical neck dissection be performed if the biopsy is positive. The one area where it is most beneficial in the adult is in differentiating lymphoma from carcinoma. This distinction avoids the panendeoscopy and the general anesthesia required in case a radical neck dissection needs to be performed. With a diagnosis of lymphoma, simple nodal excision under local anesthesia for histologic diagnosis is appropriate.

Biopsy in younger age groups

In children and young adults in whom the inflammatory and nonspecific reactive adenopathy is quite frequent, the concept of frequent, repeated examinations is most important to determine which masses are solitary and asymmetric, located in the supraclavicular area, progressively increasing in size, and/or associated with other historical or physical examination markers that would lead to a consideration of interventional therapy. Most nodal masses do not have these characteristics and may be followed clinically in the younger group. This more conservative approach to the neck mass in children is illustrated by the findings of Knight et al (1982) that of 234 children under the age of 16 years, diagnostic lymph node biopsy evaluation with culture showed a specific cause in only 41%. Only 16% were found to have malignant adenopathy. However, supraclavicular adenopathy was positive for malignancy in 60% (14 of 23) of the children.

It is in these younger age groups with the low incidence of malignancy that needle biopsy is often useful for sampling the mass, thereby allaying the physician', patient's, and family's fears of malignancy temporizing any premature open biopsy, and allowing time for appropriate clinical follow-up examinations. Because of the 16% of children with a neck mass who do have a malignancy, this group of patients must not all be diagnosed as having "inflammatory or reactive adenopathy" when they present with a neck mass. Even patients with negative needle biopsies must be followed up for the other signs of neoplasia because of the difficulty in interpreting lymphoma adequately - the largest group of tumors in these age groups - on needle biopsy. In the child, if anesthesia is needed for biopsy, an excisional biopsy is preferable to needle biopsy because of the larger amount of information obtained.

Management

Unknown primary lesion

Because of the obvious implications, any neck mass in the adult patient must be approached as being neoplastic and possibly malignant (Coker et al, 1977; McGuirt, 1978). In fact the fear of cancer usually brings the patient to the physician.

In 1952 Martin and Romieu reviewed 1300 primary tumors of the head and neck manifested by a cervical lump in 12.4% of cases. They stated, "Asymmetric enlargement of one or more cervical lymph nodes in an adult is almost always cancerous and usually is due to metastasis from a primary lesion in the mouth or pharynx". This principle remains sound today. The key to its validity lies in the words "enlarged lymph node", "asymmetric", and "adults". If the physician remembers that primary cervical malignancy is rare and that almost all malignant cervical tumors except for lymphomas are metastatic, and if the history taking and physical examination are thorough, the physician should not confuse metastatic malignant cervical tumors with inflammatory lymphadenopathy, cysts, and benign neck tumors.

A study by Lee and Helmus (1970) supports the theory that an asymmetric neck mass in the adult must be considered malignant until proved otherwise. They reviewed biopsies of neck masses in 163 patients seen consecutively in a community hospital: of patients over age 40, 29.4% had carcinoma and 21.4% had lymphoma. Those figures agree closely with the 50% incidence of neoplasia reported by Slaughter et al (1956) and Mayo and Lee (1950). The

incidence of malignant disease in a neck mass rose to 80% in the Slaughter series when benign thyroid nodules were excluded.

A second principle regarding unknown primary lesions is that the immediate removal of an enlarged lymph node for diagnostic purposes is a disservice to the patient with metastatic cervical carcinoma (McGuirt and McCabe, 1978). Distant metastases and late regional recurrences are more frequent in patients who have pretreatment biopsies than in those with the same stage of disease who do not (Table 85-5). The pretreatment group also has a higher incidence of local wound complications. These findings suggest that disruption of lymphatic drainage and manipulation of a metastatis decrease the chances for clean surgical excision and cure. Lymphangiographic studies of the neck clearly document this disruption of the normal lymphatic drainage pattern by incisional therapy.

Gooder and Palmer (1984) have similarly confirmed this increased incidence of neck recurrence and wound complications in patients on whom biopsies have been previously performed. Robbins et al (1986) have disputed this incidence of increased metastasis, complications, and recurrence. However, the series on which they base their statement is overly weighted toward unknown primary tumors and nasopharyngeal and tonsillar tumors of Waldeyer's ring, tumors that may well have natural histories and responses to treatment different from those of other mucosal squamous cell carcinomas. Indeed, their figures for distant metastasis were notably higher for tongue and hypopharyngeal primary tumors, which had had neck node violation. Similarly, their incidence of local neck recurrence was nearly double that of matched controls for patients having incisional biopsies.

Probably no surgical condition is detected more easily in early physical examination, yet more difficult to diagnose and treat definitively, than a malignant tumor of uknown primary origin located in the neck. The physician must attempt diagnosis and cure, however, and should begin with a careful examination of the oral cavity, nasopharynx, hypopharynx, larynx, thyroid, salivary glands, and skin of the head and neck. In the Martin and Morfit (1944) series of 218 patients with cervical carcinoma diagnosed by excisional node biopsy, 65% had an obvious primary lesion of the head or neck. Those findings correlate well with the findings of Jesse et al (1973), who reported that 52% of 259 patients had obvious primary lesions of the head and neck.

If the physical examination of the head and neck is negative, the physician can refer for assistance to survey the less accessible areas of the upper digestive and respiratory tracts (see Table 85-4). If that examination is negative, direct endoscopic examination should be done, radiographs obtained, and thyroid scan considered, as stated earlier. If endoscopy provides no evidence of a primary lesion, the sites most likely to contain an occult tumor should be biopsied.

The location of the lymph nodes involved should guide the surgeon to the sites for biopsy (see Fig. 85-2). Enlarged nodes high in the neck or in the posterior triangle suggest a nasopharyngeal lesion, whereas enlarged jugulodigastric nodes point more to the tonsils and the laryngopharynx, including the base of the tongue. When the enlarged nodes are in the supraclavicular area or the lower third of the neck, the surgeon must consider the whole length of the digestive tract, the tracheobronchial tree, the breast, the genitourinary tract, and the thyroid gland as potential sites of the lesion. When the mass is located in the

supraclavicular triangle, only a thorough physical examination is recommended (because of costs) to screen these areas before proceeding to biopsy if those areas are negative.

If the workup for the nonsupraclavicular neck node is thorough and the site of the primary lesion is still not apparent, an open excisional biopsy of the cervical node should be done; the patient should know that a complete neck dissection may be necessary. The biopsy must be done through an incision along a previously marked line for a radical neck dissection and only if the surgeon is prepared and capable of doing this dissection when the frozen section indicates epidermoid carcinoma or melanoma. Other findings dictate the course outlined previously (see Table 85-4 and 85-5). The need for open biopsy occurs in only approximately 5% of all cancer patients whose diagnoses start out as an unknown lesion and who undergo this diagnostic workup.

For the patient with an unknown primary metastatic squamous cell carcinoma, postoperative irradiation of the nasopharynx, the ipsilateral tonsil, the base of the tongue, and the contralateral side of the neck is sometimes advocated following radical neck dissection.

This practice of prophylactic irradiation is still controversial. Arguments against it include:

1. A percentage of unknown primary lesions are from infraclavicular sites or are metastases of a previously excised skin lesion that cannot be proved or assumed to be the source of malignancy. These lesions would not benefit from such irradiation.

2. Prophylactic radiation therapy may compromise treatment of mucosal carcinoma appearing later.

3. It may even induce later mucosal carcinoma.

4. Such therapy also may cause major prolonged morbidity in the form of xerostomia, dysphagia, and dental caries.

These factors must be weighed against the minimal increases in cure rates observed from postoperative irradiation. If the head and neck area, including Waldeyer's ring is treated with radiation therapy, the incidence o late-appearing disease decreases to roughly on half (12.5%) that without radiation therapy (25%). Jesse et al 1973) reported that figure to be as low as 5.7% and Nordstrom et al (1979) reported it to be only 2%. Jacques (1979) states that the primary source never is revealed in approximately 71% of patients whose lesions are diagnosed as unknown primary lesions and who have undergone a diligent workup, even when the follow-up period is extensive.

Primary tumors

Thyroid neoplasms, both benign and malignant, are a leading cause o anterior-compartment neck masses in all age groups and, along with lymph node malignancies, are the most common neoplastic lesions in the pediatric and young adult groups. The pediatric group frequently shows a male predominance as well as an increased incidence of malignant disease; in contrast the young adult and older groups show a greater incidence of benign conditions

and a female predominance.

Lymph node metastasis is the initial symptom in about 15% of cases of papillary carcinoma, and up to 40% of patients with malignant thyroid nodules have clinically positive neck nodes and up to 90% have histologically positive neck nodes when operated upon (McGuirt, 1989). Sonic scan, thyroid scan, and thyroid function tests should be considered for all patients having an anterior compartment neck mass. Thyroid mass lesions found to be cystic by sonography should be aspirated. Solid lesions should be treated according to their activity on nuclear scan - functioning nodules being treated by suppression and all non-functioning cold nodules being explored, with appropriate concomitant therapeutic measures being taken on the basis of histology and extent of disease. Some physicians prefer fine-needle aspiration of all solid lesions seen on sonography and therefore skip the nuclear scan. This approach requires the services of an expert cytopathologist and should not be used unless those services are available. Statistically, 20% to 25% of solitary cold nodules on a scan will prove to be cystic; 20% to 25% will prove to be cancerous (Gobien, 1979).

Lymphomas, Hodgkin's disease, and lymphosarcomas occur in all age groups but are more likely to occur in, and form a greater percentage of all neoplasms in the pediatric and young adult age groups. These lesions alone account for up to 55% of all pediatric cancers. Among children with lymphosarcoma or Hodgkin's disease, as many as 40% and 80% respectively have at least one neck mass.

Except for progressive enlargement of lymph node tissue, local head and neck symptoms are usually absent, but systemic and other organ system findings should be sought. Lymphomas are usually discrete, rubbery, and nontender.

After examination of appropriate peripheral blood smears and chest films in the young adult with an enlarging neck mass, the next diagnostic step should be open biopsy with histologic examination, followed later by appropriate staging procedures. The immediate biopsy in these younger patients following complete physical examination is permissible because of the rarity of mucosal primary carcinoma in these age groups. If routine physical examination or laryngopharyngoscopy yields an abnormality of Waldeyer's ring, biopsy of that abnormality is necessary for staging at the time of the neck node biopsy (DeVita et al, 1985; Snow, 1978).

Salivary neoplasms must be considered whenever an enlarging solid mass lies in front of and below the ear, at the angle of the mandible, or in the submandibular triangle. Benign salivary lesions are also asymptomatic, cranial nerve VII symptoms or skin fixation should suggest malignancy. Diagnost x-ray studies (sialography, nuclear scans, CT scans) will indicate whether the mass is salivary in origin, but will not help to classify it histologically. The diagnostic test of preference is open biopsy in the form of complete submandibular gland removal or superficial parotidectomy.

Like in the case of the unknown primary for which the principle is "the surgeon planning to do a node biopsy must be prepared to perform an immediate radical neck dissection", the surgeon approaching masses in and around the ear should be prepared to perform a total parotidectomy and facial nerve dissection. Any approach less complete than that will lower the patient's chance for a complete cure because there is a high risk of

implantation and seeding of benign mixed tumors, which make up two thirds of all salivary tumors.

Carotid body tumors and glomus tumors classically occur in the upper anterior triangle about the carotid bifurcation, and are pulsatile, compressible masses that rapidly refill on release of pressure and can be moved from side to side but not up or down. Both a bruit and a thrill are present, and with glomus vagale tumors the ipsilateral tonsil may pulsate and be deviated toward the midline. The diagnosis is made angiographically. Small tumors in young patients should be resected, usually after embolization (McGuirt and Harker, 1975). In elderly patients, close observation or irradiation to arrest the growth is often adequate treatment.

The best argument for postoperative irradiation can be made for the patient whose lesion is staged N1 with nodal capsular penetration, N2 or N3; surgery is reserved for the patient with N1 disease not extending through the nodal capsule. Clinicians not supporting postoperative irradiation rely on careful follow-up examination and treatment of the primary lesion when it is found. This approach requires a compliant patient.

Regardless of whether postoperative radiation therapy is used, patients with malignant metastatic cervical nodes and unknown primary lesions must be reexaminated frequently. Only careful, periodic follow-up examinations can ensure early detection and treatment of the primary malignancy.

In the past the most common site of a late-appearing primary lesion was the nasopharynx because it was the most dificult area to examine and biopsy was not done routinely. Today the most common locations of these tumors are the hypopharynx, tonsil, and base of the tongue.

Known primary lesions

The neck mass in a patient with a known primary neoplasm of the head and neck should be treated according to the principles described for each primary site in other chapters. In general, when clinically positive cervical lymph node metastases are present, a complete cervical lymphadenectomy should be done along with removal of the primary tumor. When the primary lesion is not in the head or neck, excisional biopsy of the metastatic cervical mass for confirmation and staging is indicated, with further treatment dictated by the primary lesion. However, care must be taken to follow the suggestions for an unknown primary lesion to be certain that the mass in question is not a manifestation of a second, independent primary lesion of the head or neck. This is also true for the patient with a known primary head and neck tumor and neck mass. The rate of recurrence of this second, concomitant primary lesion is significant (approximately 15%) in patients who have a head or neck neoplasm. A 6% incidence of second aerodigestive tract tumors is found only if a full panendoscopic examination is performed (McGuirt, 1982).

Knowledge of a second lesion might affect treatment decisions as well as allow better prognostic counseling to the patient. Correlations of concomitant tumor sites include larynx-lung, tonsil-esophagus, and oral cavity-oral cavity.

Schwannomas or neurilemmomas are solid neurogenic tumors that occur most

commonly in the parapharyngeal space, and will usually cause medial tonsillar displacement. They have no diagnostic characteristics although their origin from the vagus nerve may cause hoarseness and their origin from the sympathetic chain may be associated with Horner's syndrome. Routine evaluation for an unknown primary tumor is indicated before surgical exploration and excision are done.

Lipomas are ill-defined soft masses that occur in various neck locations and occur most commonly in patients over 35 years of age. They are asymptomatic and have no specific diagnostic characteristics. On a CT scan a lipoma appears as a fat-air density.

Congenital and developmental disorders

Branchial cleft cysts most commonly occur in late childhood or early adulthood (McGuirt, 1984). They frequently follow an upper respiratory tract infection, often appearing initially as an inflammatory mass, with pain, swelling, tenderness, and fever. After treatment with appropriate antibiotics, these cysts may resolve, but more frequently they persist as soft, doughy, variably sized masses, occurring in characteristic locations in the anterior triangle of the neck. The second branchial cleft cyst occurs deep to and along the anterior edge of the sternocleidomastoid muscle, coursing between the carotid branches anterior to cranial nerves IX and XII and entering the oropharynx. The less common first branchial cyst occurs along the inferior mandible, at the angle of the mandible, or just below the ear lobule. Ultrasonic scans can be helpul in identifying the lesions as cystic rather than solid. Aspiration of the contents yields a milky, mucoid, or brownish fluid, which often contains cholesterol crystals.

The treatment is initial control of local infection followed by surgical excision of the cyst and its entire tract. For first branchial cleft cysts, this means preparing for and having the skill to perform a total parotidectomy with facial nerve dissection and preservation as previously mentioned.

Thyroglossal duct cysts are anterior neck, midline structures, which, like branchial cysts, often appear after an upper respiratory tract infection. Once the acute infection has been controlled by antibiotics, ultrasonography can be used to differentiate the persistent mass from a lymph node, a dermoid cyst, or thyroid tissue. A pathognomonic sign is vertical motion of the mass with swallowing and tongue protrusion. Radionuclide scanning was at one time advocated in the workup of thyroglossal duct cysts. However, it proved to be nonrewarding and is no longer performed routinely. Only for cysts in the tongue base, which must be differentiated from undescended lingual thyroid, is the test now ordered.

The cyst tract should be removed totally with the midportion of the hyoid bone as described by Sistrunk (1928). All thyroglossal cysts and tracts should be examined histologically for the rare instance of concomitant neoplastic disease, especially when the patient has received prior neck irradiation (McGuirt and Marshall, 1980).

Lymphangiomas usually occur in the pediatric age group, most being present at birth and over 90% being evident within the first year of life. Those in the neck most commonly appear in the posterior triangle. The cervical lymphangioma is a fluctuant, diffuse, soft, spongy mass, often having indiscrete margins. It is believed to arise from incomplete development and obstruction of the normal lymphatic system. Its extent is often much greater

than is apparent. Transillumination is diagnostic, along with the physical appearance and the characteristics on palpation.

The lesion should be excised if it is easily accessible or is affecting vital functions. It should not be removed if its removal would require a mutilating procedure for limited benefits.

Hemangiomas, like lymphangiomas, are usually considered congenital because they either are present at birth or appear within the first year of life. Their bluish-purple coloration, increased warmth, compressibility followed by refilling, bruit, and thrill help to distinguish them from other head and neck masses. Angiography will be diagnostic but is rarely indicated.

Treatment consists of observation only, unless rapid growth, thrombocytopenia, or involvement of vital structures occurs, because most of these congenital lesions resolve spontaneously. Those that do not resolve may be resected later or tattooed for cosmesis.

Dermoic cysts occur most commonly in the pediatric and early adult years in the same cervical areas as branchial and thyroglossal duct cysts. Dermoid cysts slowly enlarge because of accumulation of their sebaceous content, but, unlike epidermal or sebaceous cysts, they lie deep to the cervical fascia and the skin moves freely over them. No specific diagnostic tests exist. These cysts are cured by simple complete exision.

Summary

Many head and neck disease processes manifest themselves as neck masses. These conditions are treated by surgical excision except for some inflammatory masses, and often, those too must be excised for diagnostic reasons.

The real question is *when* to excise the lesion in order to expedite treatment in a cost-effective manner. In general, when signs of inflammation are associated with the mass, antibiotic treatment with observation for up to 2 weeks is acceptable. Persistence of the mass beyond that time, or an increase in mass size during that time suggests that surgical intervention must be considered. The timing of that intervention may be tempered by the age group. A more prolonged period of observation looking for growth, or the development of other associated symptoms of malignancy is appropriate in children, because of their low incidence of malignant tumors.

If biopsy of the mass is deemed appropriate because of progressive growth, the isolated nature or asymmetry of the mass, the location (supraclavicular), the development of symptoms, associated with lymphoma (fever and spleen, liver, or Waldeyer's ring hypertrophy), or the static size (if greater than 3 cm), excisional biopsy alone without further workup is performed. This excisional biopsy alone in the young age group may be carried out after a complete examination of the head and neck and special tests yield no further information. It is acceptable because of the rarity of mucosal carcinoma (and its lymphatic spread with worsening of prognosis by biopsy) in patients from under the age of 40. Other mass lesions in those age groups do not appear to have their prognosis adversely affected by biopsy, but thyroid neoplasia, regardless of the patient's age, should be treated definitively

(based on the frozen-section diagnosis) at the time of biopsy.

In the adult patient beyond the fourth decade of life, a complete, repeated head and neck physical examination is mandatory. After this examination, needle biopsy of the mass is the current standard of care if no cause has been found for the mass. Benign cystic lesions or lymphomas indicate the need for excision, either as definitive treatment or for diagnostic reasons. If the needle biopsy is positive, equivocal, or even negative in the presence of a high index of suspicion for metastatic squamous cell carcinoma, an endoscopic examination is mandatory before open excision/biopsy of the mass and excisional removal of the mass with frozen section examination is performed. If no discrete lesion is seen, guided biopsy of the upper aerodigestive tract is performed. A concomitant radical neck dissection should be performed if the mass proves to be metastatic carcinoma.