The internist frequently encounters adult patients with a neck mass. The objective of this article is to provide the internist with general considerations when confronted with an adult patient presenting with a neck mass. A thorough gathering of historical information and a complete physical examination are crucial in refining a differential diagnosis for these patients. The location of the mass, details surrounding its appearance, and overall time course are important factors to help differentiate neoplastic disease from other possibilities in the long differential diagnosis. A persistent neck mass in an adult older than 40 years should raise a suspicion of malignancy. A neck mass in a young adult patient is more likely to be an inflammatory, congenital, or traumatic process. The clinical evaluation of a persistent neck mass may also require imaging studies or biopsy to establish the diagnosis.

Of particular concern is the adult patient who is treated with antibiotics but in whom the neck mass persists. Patients 40 years and older presenting with a neck mass have a high likelihood of harboring a malignant neoplasm. Neck mass persistence, progressive enlargement, or any other concern for a neoplastic process warrants referral to an otolaryngologist or other head and neck surgeon for further evaluation.

ANATOMIC CONSIDERATIONS

In addition to the patient’s age, the location of a neck mass plays a key role in the formation of a differential diagnosis. The neck is divided into cervical triangles, and these triangles all have a common boundary, the sternocleidomastoid muscle. The posterior cervical triangle is bound anteriorly by the posterior aspect of the
sternocleidomastoid muscle, posteriorly by the anterior border of the trapezius muscle, and inferiorly by the clavicle. The boundaries of the anterior cervical triangle are the median line of the neck, the inferior border of the mandible superiorly, and the anterior border of the sternocleidomastoid muscle posteriorly. The location of the neck mass in a particular lymphatic zone also provides the clinician a clue to the site of origin of a neoplastic or inflammatory process (Fig. 1A, B).

**FINE-NEEDLE ASPIRATION**

Fine-needle aspiration biopsy (FNAB) is the standard of care in working up an adult neck mass. FNAB, while highly dependent on the skill of the cytopathologist, is highly sensitive and specific for neoplasia, easily performed in the outpatient setting with local anesthesia, and may provide a specimen for Gram stain, acid-fast bacilli stain, or culture. In contrast to open biopsy, FNAB will not interfere with subsequent surgical treatment of a neoplastic condition. FNAB may also distinguish cystic from solid masses. While FNAB is an appropriate initial diagnostic procedure for a persistent neck mass, it should not be attempted on pulsatile neck masses. In general, FNAB is most safely performed after imaging studies are complete to avoid inadvertent biopsy of a vascular lesion.

**IMAGING**

In most situations, computed tomography (CT) of the neck with contrast is the best initial imaging study for evaluation of a neck mass in an adult. CT with contrast provides adequate information regarding, the size, extent, location, and characteristics of the mass. Cystic and solid lesions can be distinguished, and the relationship of the mass to other vital structures such as the airway, cranial nerves, and major blood vessels can be assessed. The scan will also reveal possible primary sites in the case of neoplastic disease. To encompass the entire upper aerodigestive tract, the ordering physician should request that the CT scan of the neck extend from the base of the skull to the thoracic inlet. If indicated, further imaging studies such as magnetic resonance imaging (MRI) can be obtained.1

MRI is an excellent imaging modality for soft tissue lesions, but is not required in most situations. MRI is more expensive and time consuming. However, MR imaging may be useful in certain clinical scenarios, for example, in the patient with iodine contrast reactions or for thyroid imaging. An example of an indication for MRI with contrast is the need to evaluate a thyroid mass that extends into the mediastinum. MRI is preferred in this clinical situation because the iodine load administered with CT scan is metabolized by the thyroid tissue and can interfere with radioactive iodine treatment.1

Ultrasound is the ideal imaging study for a thyroid lesion. This imaging modality, however, does not provide enough information about the character of a neck mass and the relationship to other structures for a routine evaluation of a neck mass outside of the central compartment. Therefore, if imaging is included in the workup, CT of the neck with contrast should be obtained.2

**UPPER ENDOscopy**

Occasionally the FNAB is diagnostic for carcinoma, yet no primary site can be identified on imaging or head and neck examination. This situation warrants a complete endoscopic examination of the upper aerodigestive tract under general anesthesia, with directed biopsies in an attempt to ascertain the primary site. Another indication for operating room management is for those cases where lymphoma is high in the
Fig. 1. (A) The major triangular divisions of the neck and lymphatic drainage patterns indicate primary location of inflammatory and neoplastic disease processes. GI, gastrointestinal; GU, genitourinary. (B) Adult patient with a neck mass located in the superior aspect of the anterior cervical triangle.
differential. A definitive diagnosis often requires an open neck biopsy to obtain sufficient amount of specimen to perform flow cytometry studies.

DIFFERENTIAL DIAGNOSIS OF NECK MASSES

The following sections are brief descriptions of pertinent historical information, physical examination findings, laboratory tests, and imaging studies for each differential diagnosis category. While not representing a complete list of differential diagnoses or diagnostic approach for an adult with a neck mass, the descriptions provide a framework on which to build clinical decision making. As illustrated in this article, the differential diagnosis is extensive and is easily remembered by employing the mnemonic “KITTENS” (Table 1) as initially described in Pasha’s book, *Otolaryngology: Head and Neck Surgery Clinical Reference Guide*, an acronym for K—congenital/developmental anomalies, I—infectious/inflammatory, T—trauma, T—toxic, E—endocrine, N—neoplasms, and S—systemic diseases.

**K: Congenital/Developmental Anomalies**

Thyroglossal duct cyst is the most common congenital neck anomaly and represents persistence of the thyroglossal duct. This cyst most commonly presents as a midline

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*KITTENS* mnemonic for the differential diagnosis of the adult neck mass

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<td>Branchial cleft cyst</td>
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<td>Dermoid cyst</td>
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cystic mass, usually inferior to the hyoid bone that (classically at least) elevates with swallowing or protrusion of the tongue. These cysts, usually inferior to the hyoid bone that elevates with swallowing or protrusion of the tongue,4 Thyroglossal duct cysts are usually diagnosed by the age of 5 years, and 60% of them are diagnosed before age 20. However, about 7% of the adult population still has this abnormality.5 These cysts may become evident after an upper respiratory tract infection, and it is appropriate to treat any acutely infected thyroglossal cyst with antibiotics. An important consideration in adults is that this mass may contain, although rarely, the only functional thyroid tissue in the patient; therefore, palpation of a normal thyroid gland is a key aspect of the physical examination. CT scan of the neck with contrast is the single most important imaging study and should be obtained in adults with suspected thyroglossal duct cyst. The CT scan can confirm the presence of a thyroid gland. In addition, approximately 1% of adult thyroglossal duct cysts contain carcinoma foci, and CT scans can reveal calcifications in these areas of carcinoma.4 Treatment involves complete excision.

Branchial cleft cysts are most commonly found in late childhood or early adulthood. Similar to thyroglossal duct cysts, they are frequently diagnosed following an upper respiratory tract infection when the mass becomes inflamed. Occasionally the mass resolves, but most often they persist as a soft mass in the neck. The first branchial cleft cyst is found at the mandibular angle inferior to the ear lobule along the inferior border of the mandible, and may have a tract that connects to the external auditory canal. The second branchial cleft cyst is the most common type, and may have a tract that opens along the anterior border of the sternocleidomastoid muscle. This cyst sometimes has a tract that opens in the oropharynx at the superior portion of the tonsillar fossa. CT of the neck with contrast is an appropriate imaging study in an adult patient. Initial management is with appropriate antibiotics if the mass is infected. Definitive treatment is complete surgical excision of the cyst and tract.6

Ranulas are mucus retention cysts or mucus extravasation pseudocysts in the floor of the mouth. A plunging ranula is a mucus extravasation pseudocyst that more commonly arises from the sublingual gland, and may present as a neck mass when it, by definition, extends through the mylohyoid muscle. History reveals a progressively enlarging cyst in the neck. A plunging ranula may present as a submandibular mass without obvious intraoral involvement, and waxes and wanes in size. Physical examination reveals a soft, compressible mass in the neck, usually in the submandibular triangle.7 CT scan of the neck with contrast is the best imaging study to evaluate the mass.3,8 Treatment is excision of the sublingual gland and ranula in continuity to minimize the risk of recurrence.7

Dermoid cysts are rare but may present as a painless, superficial, soft, doughy mass in the neck. The most common location in the neck is in the submental triangle (under the chin). Dermoid cysts most commonly present in children or young adults. The dermoid cyst progressively enlarges due to accumulation of sebaceous contents.9 Some physicians advocate use of MRI to distinguish this mass from other neck masses,10 but first-line evaluation for most neck masses in adults is CT of neck with contrast. Treatment is with surgical excision.

Lymphangioma, or lymphatic malformation, is a rare, congenital anomaly that usually presents in childhood and occasionally in adults. The majority of cases occur in the head and neck, mostly in the posterior triangle. Diagnosis is by history of a soft, compressible neck mass that usually enlarges proportionally with the growth of the patient. Characteristic findings of cyst-like structures on imaging studies like CT scan of the neck with contrast aid in diagnosis. Definitive diagnosis of lymphangioma is from operative pathology. Treatment regimens vary depending on macrocystic or microcystic features, but usually involve an attempt at complete surgical excision, although usually this is a difficult endeavor.11
Deep neck space infections and neck abscesses in adults are often caused by an odontogenic or salivary source. Other causes include penetrating trauma, spread of infection from more superficial infections, and in cases in which no source is identified, branchial cleft cysts or fistulae. Important historical information encompasses symptoms of infection including pain, swelling, erythema, fever, odontalgia and/or history of recent dental procedure, spontaneous purulent drainage, accompanied by a progressively enlarging neck mass. There may be airway compromise as well, depending on abscess size, specific neck location, and edema. Physical examination reveals a tender swelling in the neck with possible overlying erythema, induration, and local fluctuance. The imaging study of choice is a CT scan of the neck with contrast. Treatment involves appropriate antibiotics and surgical drainage depending on size and response to antibiotics. An important point is that in adults, a necrotic, inflamed lymph node from a metastatic cancer may present in a similar manner to a neck abscess. If there is suspicion for a malignancy, CT of the neck will also be an important study (see N: neoplasms).

Acute sialadenitis presents with pain and swelling of the affected salivary gland, accompanied by systemic symptoms of infection. History taking should include onset of pain and swelling, gradual or rapid onset, odontalgia to assess for possible dental abscess, and medical and surgical history to identify risk factors. Common risk factors include an elderly, debilitated patient, dehydration, recent surgery, and recent dental procedures. Physical examination reveals local edema, erythema, induration, warmth, and tenderness to palpation, and likely reveals systemic signs of dehydration. Palpate the involved area to assess for fluctuance that might indicate abscess formation. Perform bimanual examination by compressing the gland with one hand and by applying pressure in the direction of the respective salivary gland duct using the other hand. Assess for purulent discharge from the duct opening into the oral cavity. Also inspect the teeth, as dental abscess is one of the differential diagnoses. Laboratory tests usually reveal leukocytosis with predominance of neutrophils, and some advocate obtaining cultures of purulent drainage if present. Initial management includes appropriate antibiotics, hydration, sialogogues (such as lemon wedges), bimanual massage working in the direction of the duct opening in the oral cavity, warm compresses, appropriate pain control, and good oral hygiene. If there is no improvement in 2 to 3 days, or if abscess is suspected by physical examination, obtain a CT of the neck with contrast to assess for the presence of an abscess. If an abscess is present, surgical drainage is indicated. Once symptoms resolve, continue antibiotics for an additional week.

Chronic sialadenitis usually results from sialolithiasis or salivary duct stenosis or compression. Obstruction results in salivary gland hypertrophy and fibrosis from chronic inflammation, and may lead to chronic pain of the involved gland. Patients usually report an initial episode of acute sialadenitis followed by repeated episodes of local pain and swelling. The underlying cause is often sialolithiasis, but may also include entities such as stricture of the salivary duct or compression from tumor. Physical examination is similar to acute sialadenitis, but finding the underlying cause is important. Evaluation may involve CT of the neck with contrast, among other studies. Management involves appropriately treating any episodes of acute sialadenitis (see previous section) and identifying and treating the underlying cause of the chronic inflammation. In many cases, surgical excision of the involved gland is the definitive treatment.

Cervical lymphadenopathy may result from a variety of viral infections, including systemic infections such as human immunodeficiency virus (HIV), infectious
mononucleosis (EBV), cytomegalovirus, or toxoplasmosis. Such infections may lead to cervical lymphadenopathy as well as more generalized lymph node involvement. A thorough history and review of systems is important to recognize the other symptoms of these systemic infections. On physical examination, it is important to note the location of the lymphadenopathy, size of the lymph nodes, mobility, lymph node consistency with respect to firmness, softness, or fluctuance, and tenderness to palpation. Diagnostic approach and treatment are determined by the suspected viral infection. After appropriate treatment, however, if the lymphadenopathy persists or enlarges, FNAB or referral to an otolaryngologist for possible lymph node biopsy is appropriate.\textsuperscript{16}

Cat scratch disease is a bacterial infection caused by \textit{Bartonella henselae}, which is transmitted by a cat scratch/bite or flea bite and often results in cervical lymphadenopathy. In the United States it generally occurs in young patients less than 21 years who are immunocompetent. History reveals exposure to kittens or to cats with flea infestation. Patients demonstrate regional, usually single node lymphadenopathy, and the location depends on the site of inoculation. The cervical region is one of the most common sites of involvement. The nodes are usually tender, possess overlying erythema of the skin, and are occasionally suppurative. Most involved nodes range in size from 1 to 5 cm. Patients also usually have a cutaneous lesion at the site of inoculation. Systemic involvement may occur, but less commonly than the cervical lymphadenopathy. Diagnosis is from history/physical examination and positive serology for \textit{B henselae}. Treatment is medical using oral antibiotics.\textsuperscript{17,18}

Tuberculous lymphadenitis in the cervical region, also known as scrofula, is a manifestation of extrapulmonary tuberculosis (\textit{Mycobacterium tuberculosis}). Cervical lymphadenopathy is the most common manifestation of tuberculosis in the head and neck region. Patients most commonly present with multiple, matted, rubbery bilateral lymph nodes in the posterior cervical chain. Physical examination demonstrates firm, fixed masses in the posterior cervical region with or without overlying skin induration, a draining sinus, or fluctuance. Diagnosis is by FNAB, or occasionally excisional lymph node biopsy, following a positive PPD skin test, and other necessary tests to rule out pulmonary disease. A chest imaging study is always warranted when tuberculosis is suspected. Treatment usually involves a combination of 4 antitubercular medications. Complete excision becomes necessary when there is an actively draining sinus or fluctuance.\textsuperscript{19}

Atypical or nontuberculous mycobacterial infections are usually seen in children and in immunocompromised patients (eg, HIV positive). These infections present as isolated disease, such as submandibular and submental cervical lymph node involvement. Patients rarely have constitutional symptoms. The atypical mycobacterial organisms are known to be resistant to antitubercular multidrug therapy. Due to this resistance, atypical mycobacterial infections are primarily treated with excision of the involved lymph node. Sometimes curettage is preferred to surgical excision. However, surgical management may not be necessary in all cases if the organism is sensitive to other antibiotics. However, surgical treatment is usually indicated in this type of infection.\textsuperscript{20}

\textbf{T: Trauma}

Neck masses caused by trauma have a history and physical examination consistent with the type of trauma. A recent hematoma may reveal ecchymosis overlying a neck swelling, and is often tender to palpation and soft. In contrast, if the hematoma is well organized, it may become firm due to fibrosis. History and examination are
diagnostic, and small hematomas usually resolve gradually without intervention. However, acute, expanding hematomas require surgical exploration and referral to an emergency department for immediate care.

Pseudoaneurysm or arteriovenous fistula may occur after shearing or penetrating trauma to the neck. Such a fistula may go unrecognized and later present as a soft, pulsatile mass with a thrill or bruit. A contrast-enhanced CT scan may assist in diagnosis, and treatment is surgical ligation.

Laryngocele may be caused by repeated use of musical instruments such as a trumpet. Diagnosis is established by history, physical examination, CT scan with contrast, and laryngoscopy if indicated. The lesion may continue to grow causing intermittent globus sensation, and serve as a nidus for infection. Surgical excision is definitive management.\textsuperscript{15}

\textbf{T: Toxic}

Thyroid toxicosis is a biochemical disease entity that results from exposure to excessive concentrations of thyroid hormones. This disease state is 10-times more likely to occur in women. Graves disease is responsible for this condition in 60\% to 85\% of patients. Toxic nodular goiter results in 10\% to 30\% of cases while toxic thyroid adenoma is responsible for 2\% to 20\% of cases.\textsuperscript{6,21} Thyroid disease is discussed in the article by Matthew C. Miller elsewhere in this issue.

\textbf{E: Endocrine}

Thyroid pathology is the leading cause of anterior neck compartment masses. The thyroid nodule is extremely common, occurring in 4\% to 7\% of the adult population, and about 5\% of such nodules harbor a malignancy. Both of these thyroid conditions are discussed in the article by Matthew C. Miller elsewhere in this issue.

Parathyroid cysts are a rare entity but are clinically significant lesions. The literature reports 15\% to 57\% of parathyroid cysts as functional, although 33\% is more commonly referenced. These functional cysts contribute approximately 1\% to the cases of hyperparathyroidism.\textsuperscript{22} The most common clinical presentation includes complaints of dysphagia with a female preponderance and greater than one-third demonstrating a palpable neck mass in the anterior cervical triangle. Symptoms of hypercalcemia-related hyperparathyroidism occur in the one-third of patients who harbor a functional parathyroid cyst. Other cystic lesions that may similarly present include branchial cleft cysts, cystic papillary carcinoma, and thyroglossal duct cysts, although thyroglossal duct cysts are usually midline masses that move with deglutition. As this differential diagnosis comprises surgical conditions, referral to an otolaryngologist with a good contrast-enhanced CT scan provides an adequate initial workup.

Another rare endocrine disease entity is parathyroid carcinoma, which accounts for approximately 1\% of parathyroid pathologies. There is an equal sex distribution, and patients typically present during the sixth decade of life. The common features on presentation are those of hyperparathyroidism including fatigue, weight loss, psychiatric symptoms such as memory loss, muscular weakness, kidney stones, bone disease, and abdominal complaints such as constipation. The patient may have a breathy voice if the recurrent laryngeal nerve is invaded and there may be a palpable, firm mass that may trigger the diagnosis of parathyroid carcinoma when coupled with symptoms of hyperparathyroidism.\textsuperscript{23,24} These symptoms should elicit a serum calcium level, a serum intact parathyroid hormone assay and referral to both an otolaryngologist and an endocrinologist. Contrast-enhanced CT scan of the neck is also beneficial in delineating the extent of disease and whether clinically significant lymph nodes are present.
Adult Patients with Neck Mass

N: Neoplasms

Adults older than 40 years have a high likelihood of harboring a malignant neoplasm. Malignant neoplasms as they relate to the upper aerodigestive tract are discussed in the article by Crozier and Sumer elsewhere in this issue. Some of the other more common benign and malignant neck neoplastic lesions are discussed here, including salivary gland neoplasms, primary vascular neoplasms, neurogenic neoplasms, and lymphoma.

The majority, that is, approximately 80%, of salivary gland neoplasms arise in the parotid gland. Neoplasms of the parotid gland are benign themselves approximately 80% of the time as well, while 50% of submandibular gland neoplasms are benign. Historically, patient tobacco and alcohol use are not associated with an increased incidence of salivary gland neoplasm, although some studies suggest an association of tobacco use with the development of a Warthin tumor. A history of radiation may increase the risk of benign pleomorphic adenoma or mucoepidermoid carcinoma. Occupational exposure to wood or silica dust is also associated with salivary gland malignancy. Patients typically present with an asymptomatic neck mass anterior to the ear, inferior to the ear lobe corresponding to the tail of the parotid gland, or in the submandibular triangle. Tenderness to palpation is unusual but may occur with associated infection. Examination of the face or scalp may reveal a skin cancer that has metastasized to an intraparotid lymph node(s). A firm mass or facial nerve paresis is a poor prognostic finding associated with malignancy. A contrast-enhanced CT scan of the neck is warranted as well as FNAB for definitive surgical treatment.

Other common benign neoplasms presenting in the neck involve tumors arising from elements of the parapharyngeal space. These neoplasms include salivary gland tumors, neurogenic tumors, and paragangliomas (carotid body tumors, glomus jugulare, glomus vagale). The patient may complain of dysphagia, dyspnea, symptoms of obstructive sleep apnea, symptoms of eustachian tube dysfunction, or other symptoms related to cranial neuropathies. These symptoms usually present with significant tumor size. In addition, symptoms of flushing, hypertension, and palpitations may occur in association with functional paragangliomas. The most common finding on physical examination is that of a painless neck mass or painless oropharyngeal mass. The neck mass may have a palpable thrill or audible bruit. Paragangliomas derived from the carotid body are mobile in an anterocephalad direction but not in a vertical direction.26 Patients with these symptoms and clinical findings warrant a contrast-enhanced CT scan of the neck, preferably from the skull base through the clavicles, before referral to an otolaryngologist. In addition, patients with symptoms of a secreting paraganglioma should undergo a 24-hour urine collection for catecholamines and their metabolites.

Lipomas and especially liposarcomas are extremely rare lesions presenting above the clavicles, as they usually occur in extremities and the trunk. In general, patients present with a slowly enlarging, painless neck mass. A history of trauma to the area affected may also be elicited.27 Physical examination reveals a subcutaneous, smooth-surfaced soft tissue mass. A contrast-enhanced CT scan of the neck is warranted to determine the extent of the process before complete surgical excision.

Lymphomas are a heterogeneous group of lymphoproliferative disorders and are generally classified as Hodgkin or non-Hodgkin lymphoma. Symptoms include odynophagia, globus sensation, otalgia, or hearing loss associated with otitis media and dysphagia. Classic constitutional symptoms include fever, night sweats, and weight loss. Lymphomas present most frequently with lymphadenopathy and frequently involve the head and neck region. In the head and neck region this disease most often
presents as a painless nodal mass. The mass may become painful with rapid growth. Hodgkin disease rarely presents in extranodal sites in the head and neck area, whereas non-Hodgkin lymphoma often presents with extranodal manifestation in the Waldeyer ring, mainly the palatine tonsil and nasopharynx. CT imaging studies of the head and neck, chest, abdomen, and pelvis assist in staging, in addition to planning the most appropriate site for biopsy to confirm the diagnosis. Open biopsy is frequently necessary to ensure an adequate specimen for appropriate cytogenetic studies.

**S: Systemic Diseases**

There are a few rare systemic disease conditions with manifestation of neck masses as part of the disease entity. Such disease entities include Sjögren syndrome, sarcoidosis, Kimura disease, and Castleman disease. In addition, manifestation of the HIV systemically occurs frequently in the neck, as discussed previously with respect to infectious and neoplastic processes.

Primary Sjögren syndrome is a chronic disorder characterized by the Sicca complex of xerophthalmia with secondary keratoconjunctivitis and xerostomia. This syndrome is caused by immune-mediated destruction of the exocrine glands of lacrimation and salivation. Secondary Sjögren syndrome refers to the Sicca complex in association with other connective tissue disorders such as rheumatoid arthritis or systemic lupus erythematosus. This disease occurs in 1% of the population, with onset between the ages of 40 and 60 years and with a 9:1 female predilection. Approximately 80% of patients complain of xerostomia-related complications such as dysphagia, change in taste, fissures of the tongue and lips, and increased dental caries. Ocular symptoms include dryness, burning, foreign body sensation, and itching. Sinonasal complaints also occur, and manifest as epistaxis in 50% and hyposmia in 40% of patients. Approximately one-third of patients develop persistent salivary gland enlargement. These symptoms should prompt an autoimmune serologic workup and referral to an otorhinolaryngologist for a salivary gland biopsy, which is the single best diagnostic test.

Sarcoidosis is a multisystem disorder of unknown cause. Otorhinolaryngologic manifestations of sarcoidosis occur in 10% to 15% of patients. The most common sites of head and neck involvement are the cervical lymphatics, parotid glands, and facial nerve. Cervical adenopathy is the most common of the aforementioned head and neck manifestations, and was present in 48% of patients in a series by Dash and Kimmelman. Referral to an otorhinolaryngologist for diagnostic confirmation by FNAB or open biopsy demonstration of noncaseating granulomas is warranted.

Kimura disease is a chronic inflammatory condition characterized by a triad of painless subcutaneous masses in the head or neck region, blood and tissue eosinophilia, and markedly elevated serum immunoglobulin E levels. This condition is endemic to Asian countries, although reported in America and Europe in Asian descendants. These patients are typically male, with a 76% incidence of subcutaneous soft tissue and deep cervical masses in the head and neck region on physical examination. These lesions are nontender and poorly circumscribed, commonly involving the periauricular, epicranial, and orbital regions of the head, and frequently manifest in the submandibular triangle (43%). Patients may complain of pruritus and are most frequently free of systemic symptoms. A contrast-enhanced CT scan is nonspecific, usually demonstrating homogeneous-appearing lymph nodes with slight enlargement of the major salivary glands. The differential diagnosis includes lymphoma, scrofula, and eosinophilic granulomas. If the workup for tuberculosis is negative, referral to an otorhinolaryngologist for biopsy is appropriate.

Castleman disease is an uncommon nonneoplastic lymphoproliferative disorder that can present as a solitary cervical lesion. Although this disease entity involves
benign lymph node hyperplasia and usually affects the mediastinum, the second most commonly involved site is the head and neck area. The disease may manifest in a localized unicentric pattern with a slow-growing lymph node or as a multicentric systemic disease with numerous constitutional symptoms. Presenting signs and symptoms are generally nonspecific and therefore, Castleman disease should be considered in the differential diagnosis of long-standing inflammatory or neoplastic cervical masses. A contrast-enhanced CT scan of the neck is helpful in defining the extent of disease. In addition, enhancement of the lesion differentiates this from lymphoma, which does not typically enhance. The diagnosis of Castleman disease is often difficult and when considered in the differential diagnosis, surgical excision with pathologic review is required to establish this diagnosis.

**SUMMARY**

The differential diagnosis for a neck mass is extensive and is easily remembered by employing the mnemonic “KITTENS” (Table 1), which is an acronym for K—congenital/developmental anomalies, I—infectious/inflammatory, T—trauma, T—toxic, E—endocrine, N—neoplasms, and S—systemic diseases. Depending on the patient’s age, the focus of this differential changes. For patients younger than 40 years the initial considerations should include congenital anomalies or infectious/inflammatory causes. In addition, traumatic origin of neck mass formation is also more common in this age group. However, for patients 40 years and older, 80% of neck masses are associated with a neoplastic process. Additional causes to consider for the development of a neck mass are endocrine pathologies and, more rarely, systemic disease.

**ACKNOWLEDGMENTS**

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**REFERENCES**