
CHAPTER 1

General Otolaryngology

CASE 1: ADULT NECK MASS

Patient History

A 42-year-old male presents to your clinic with a history of left neck swelling. Three weeks ago, he underwent extraction of his left third molar. One week after this procedure he noticed a nontender lump in his left neck while shaving. His dentist subsequently placed him on a 1-week course of oral antibiotics, but the mass failed to resolve and appears to have gotten larger. He says that the mass is nontender and nonpainful. He denies any recent sick contacts or travel and he has no pets in the home. He reports no malaise, fever, or recent unintended weight loss.

What specific historical factors should you inquire about in this patient?

The adult neck mass has the potential to represent a broad array of potential disease processes, and the differential diagnosis for this presentation is extremely broad (Table 1–1). Patient history and demographics, as well as exam findings, are crucial to narrowing the differential. Information regarding the character of the mass, its onset, the presence of associated pain/tenderness, duration, and progression of growth or shrinkage should all be sought during the initial history. The presence of associated complaints such as fever, post-nasal drip, rhinorrhea, sore throat, otalgia, night sweats, unintentional weight loss, malaise, dysphagia, and hoarseness should be explored.

Additionally, important relevant contributing factors such as recent travel, recent trauma, infections (tuberculosis, upper respiratory infection [URI], sinus, skin, otitis media), and exposure to pets and animals should be obtained. Social history should elicit information regarding risk factors for malignancy: prior radiation therapy or exposure, family or personal history of cancer, smoking, alcohol abuse. Finally, a thorough past

medical history (PMH) should educe any systemic conditions that may cause a neck mass: immunodeficiency, diabetes mellitus, corticosteroid use, and human immunodeficiency virus (HIV).

You obtain a comprehensive PMH and review of systems (ROS), which are detailed below (PSH, past surgical history; NKDA, no known drug allergies).

Past Medical History

PMH: Hypercholesterolemia

PSH: No prior surgeries

Allergies: NKDA

Medications: Lipitor

Family History: Noncontributory

Social History: Lifelong nonsmoker and nondrinker. No history of illicit drug use. Patient is married with 2 children.

ROS: Pertinent (+): left neck mass, tooth pain

Pertinent (–): no weight loss, no pain, no tenderness, no dysphagia/odynophagia, no respiratory distress

Physical Exam

Describe your approach to examining this patient.

A thorough head and neck physical examination is essential prior to imaging or biopsy. Examination should include a thorough survey of the entire head and neck, including fiberoptic exam of the nasopharynx, hypopharynx, and larynx. Evaluation for congenital morphologic abnormalities of the head and neck should be performed.

The character of the mass must also be carefully examined, including its size, location, mobility, consistency (firmness, compressibility), presence of

tenderness, fluctuance. Additionally, the presence of generalized cervical adenopathy, nearby lesions, and the character of the overlying skin (erythematous, blanching, pits or fistulas, induration, necrosis) should be determined. Palpation of the thyroid should be performed. Examination for lymphadenopathy in other regions (axillary, inguinal, supraclavicular fossa) should be performed. Lastly, one should assess for bruits, by auscultation over the mass.

Exam Findings

Comprehensive physical examination of the head and neck is performed, including flexible fiberoptic endoscopy. No mucosal lesions or irregularity is identified. Examination of the oral cavity reveals his molar extraction site to be well healed with no sign of infection. Examination of the neck reveals a palpable, 2.5-cm mass in level II of the left neck. The remainder of the exam is unremarkable.

Workup

What diagnostic tests can assist you in the workup of this patient?

Labs: Complete blood count (CBC) with differential, Monospot, purified protein derivative, cat scratch titers, Epstein–Barr virus serology, HIV testing, toxoplasmosis

Imaging

Computed tomography (CT) scan of the head and neck with IV contrast: Considered by most to be the modality of choice for the evaluation of cervical neck masses. Can distinguish cystic from solid lesions and can define the origin and full extent of the mass to assist with analysis of the surgical respectability of a lesion. When used with contrast, CT can delineate the vascularity of a lesion.

Ultrasound: Useful in differentiating cystic from solid masses and congenital cysts from solid lymph nodes and glandular tumors. Can be of use in guiding fine needle aspiration biopsy (FNAB). Its use with Doppler may help define vascular lesions.

Angiography: Useful for suspected vascular lesions.

Magnetic resonance imaging (MRI): Provides much similar information as CT but with less bony and improved soft tissue detail. Ideal for upper neck and skull base masses or those with suspected intracranial involvement. Addition of contrast assists with the evaluation of vascular lesions.

Chest x-ray: Useful as a screening tool for detecting occult primary malignancy or infection (ie, tuberculosis) of the pleural cavity.

Positron emission tomography (PET) or PET/CT scan: While not typically a part of the standard workup of a neck mass, it is occasionally used in the initial workup of an unknown primary tumor of the neck or to help direct biopsies during pan-endoscopy.¹ Studies have shown that in cases of unknown primary, PET imaging may identify an additional 24% of primary tumors, and PET/CT an additional 31.5% of primary tumors following an evaluation that includes physical examination and CT scan or MRI.^{2,3} PET, however, is prone to false positives for both the tonsil (~40%) and the base of the tongue (~20%); the false-negative rates for these sites were 13% and 17%, respectively.⁴

Fine needle aspiration biopsy: FNAB remains the workhorse diagnostic test for evaluation of neck masses, cystic or solid. Results of FNAB allow for differentiation between inflammatory and reactive processes that usually do not require surgery from neoplastic lesions, either benign or malignant. It also provides fluid for culture in cases of suspected infection. It is prudent to obtain imaging (CT or ultrasound) prior to biopsy of a neck mass in order to determine the nature of the mass (cystic or solid) and feasibility of adequate biopsy and to rule out an anatomic contraindication to biopsy (vascular lesion). It is important to note that the sensitivity of FNAB for diagnosing malignancy in cystic masses is considerably lower than that of solid neck masses.

A CT of the neck with contrast is obtained (Figure 1–1).

Differential Diagnosis

What is your differential diagnosis for this patient?

The differential diagnosis for the adult neck mass is broad and includes a myriad of potential

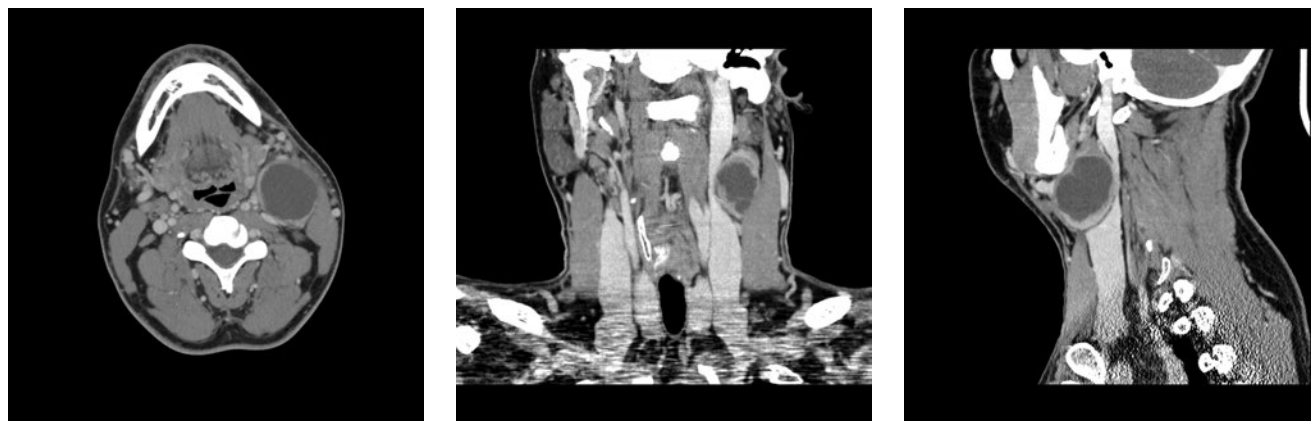


Figure 1–1. Left: Axial view of CT of the neck with contrast. Middle: Coronal view of CT of the neck with contrast. Right: Sagittal view of CT of the neck with contrast.

conditions. For the purposes of organization, it is helpful to group these etiologies into 3 broad categories: congenital, inflammatory, and neoplastic. In patients over age 40, neoplastic causes should be at the top of your list. However, congenital and inflammatory causes should be ruled out only after a thorough history and physical exam. Table 1–1 lists the diagnoses that you should consider for any adult patient presenting with a neck mass.

Which patient history or demographic factor is most important to consider in narrowing your differential diagnosis?

- Nonsmoker, nondrinker
- History of recent dental procedure ipsilateral to his neck mass
- Patient age
- Lack of recent URI symptoms

Answer: c) A reported 80% of cystic lesions in patients over 40 years of age are malignant.⁵ Therefore, a unilateral, asymmetric neck mass in a patient older than 40 years should be considered a malignancy until proven otherwise.

How does the cystic nature of this mass impact your clinical suspicion of malignancy?

Although it is generally accepted that the most common cause of a cystic mass in the neck is a branchial cleft cyst, in patients who present with a solitary lateral cystic neck mass a diagnosis of

head and neck squamous cell carcinoma must be considered strongly before dismissing the mass as a congenital lesion. Second branchial cleft cysts often present as a cystic structure at level IIa, but typically present within the first 2 decades of life. Based on this patient's history and demographic factors, your clinical suspicion for malignancy should remain high. Primary tumors of the thyroid may present with cystic nodal metastases, and this possibility must be considered, especially in younger patients.⁶ Likewise, tumors arising from primary sites in Walldeyer ring (tonsil, base of tongue, nasopharynx), particularly those associated with human papilloma virus (HPV)–related squamous cell carcinoma (SCCA), usually metastasize to level IIa, ipsilateral to the primary tumor, and very often form metastases with cystic degeneration.⁷

Fine Needle Aspiration Is Obtained, Revealing "Atypical Squamous Cells and Cyst Fluid."

What is the next most appropriate step in the management of this patient?

This patient is presenting with an asymptomatic cystic mass at level IIa of the left neck. A complete physical exam revealed no evidence of a primary lesion. CT also failed to identify a primary site, and the results of fine needle aspiration (FNA) are equivocal but suggestive of malignancy.

Table 1–1. Differential Diagnosis of the Adult Neck Mass: KITTENS Method*

| Congenital | Infectious and iatrogenic | Toxins and Trauma | Endocrine | Neoplasms | Systemic |
|-----------------------------|---|-------------------|------------------------------------|--|-------------------------------------|
| Branchial cleft cysts | Bacterial or viral lymphadenitis | Hematoma | Thymic cyst Thyroid hyperplasia | Metastatic or regional malignancy | Granulomatous diseases |
| Cystic hygromas | Tuberculosis | | Aberrant thyroid tissue | Thyroid neoplasia | Laryngoceles |
| Teratomas and dermoid cysts | Cat-scratch disease Syphilis | | Parathyroid cyst | Lymphoma | Plunging ranula Kawasaki disease |
| Thyroglossal duct cyst | Atypical mycobacteria | | | Salivary gland tumors | |
| External laryngoceles | Persistent generalized lymphadenopathy Mononucleosis Sebaceous cyst Deep inflammation or abscess | | | Vascular tumors Neurogenic tumors Lipoma | |

*KITTENS = Kongenital, Infectious and iatrogenic, Toxins and Trauma, Endocrine, Neoplasms, Systemic.

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Malignancy should remain at the top of your differential in this scenario, despite the equivocal FNA findings. The FNA results are suggestive of a metastatic SCCA, likely from an unknown primary site. It is important to note that the sensitivity of FNAB for diagnosing malignancy in cystic masses is considerably lower than that in solid neck masses,⁸ and thus this should be taken into account in interpretation of your biopsy results when the pretest probability of malignancy remains high.

Subsequent diagnostic workup should be geared toward identifying a primary site. Further diagnostic options include PET scan and panendoscopy with biopsies.

You perform a PET scan, which reveals asymmetric uptake of 2-fluoro-2-deoxy-D-glucose in the left tongue base. The patient is taken to the operating room for panendoscopy with biopsies.

What sites should you biopsy in this patient?

Positive results on PET scan may guide the clinician to a potential biopsy site, but the PET may not always assist in localizing a primary. You

should keep in mind that a positive PET or PET/CT finding does not absolutely prove the presence of cancer, and absence of PET/CT localization of the primary should not deter you from performing panendoscopy with directed biopsies.

A systematic approach is best for the exploration and biopsy of potential sites of occult primary tumor. The following sites should be included in your directed biopsy based on their likelihood of harboring an occult primary tumor: palatine tonsils (via tonsillectomy), bilateral base of tongue, nasopharynx, and piriform sinuses.⁹

What laboratory test can you request for your biopsies that may assist in determining a primary site?

In situ hybridization or polymerase chain reaction for p16 (a surrogate marker for HPV[+] SCCA) can be performed on biopsy specimens to help determine a primary site (base of tongue or tonsil).¹⁰

Your biopsy result from the left base of the tongue reveals SCCA. Histopathologic analysis of the specimen reveals it to be p16 positive.

Diagnosis: *SCCA of the left tongue base metastatic to the left neck*

Case Summary

This case illustrates the importance of a thorough, systematic workup of the adult patient presenting with a neck mass. Patients over 40 years of age (regardless of the presence or absence of specific risk factors) should be considered to have a malignancy until diagnostic workup proves otherwise. The presence of a cystic degeneration of the mass should not lower your suspicion of malignancy in the adult population. This is of particular importance when a primary site is not evident, because in this setting, a cystic metastasis is at great risk of being mistakenly diagnosed as a branchial cleft cyst or other congenital mass.⁸ The incidence of unsuspected carcinoma in cervical cysts initially presumed to be branchial cleft cysts has been estimated to be as high as 22%, with a higher incidence in older adults.⁸

Imaging (CT, MRI, or ultrasound) along with FNAB are the mainstays of diagnostic workup of a neck mass, yet results of these modalities may be equivocal in some cases. In cases with a negative physical exam and initial imaging workup, a PET or PET/CT scan with directed biopsies may yield a diagnosis in many cases of metastatic SCCA from an unknown primary. Finally, in cases with a completely negative workup with equivocal FNAB results, open biopsy by way of neck dissection may be indicated.

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CASE 2: CONNECTIVE TISSUE DISORDERS

Patient History

A 40-year-old female presents to your clinic with a chief complaint of bilateral nasal obstruction. She reports that her symptoms have been present for several months and have been progressive in nature. She endorses symptoms of foul-smelling nasal drainage over the past week, and recurrent nose bleeds over the past month. She has been treated in the past with antibiotics by her primary care physician for several sinus infections, but they have failed completely to resolve.

You begin by obtaining a comprehensive PMH and ROS, as detailed below.

Past Medical History

PMH: Recurrent sinusitis, migraine headaches

PSH: Tonsillectomy, no prior history of nasal or sinus surgery

Medications: Topamax, Flonase

Allergies: NKDA