

ASSESSMENT OF A NECK MASS

CLINICAL EVALUATION

- ▶ **evaluation of any neck mass begins with a careful history taken with the differential diagnosis in mind.**
- ▶ **directed questions can narrow down the diagnostic possibilities and focus subsequent investigations.**
- ▶ **in younger patients, one might suspect congenital or inflammatory lesions,**
- ▶ **whereas in older adults, the first concern is often neoplasia.**

Benign neoplasms

Salivary gland tumor

Thyroid nodules or goiter

Soft tissue tumor (lipoma, sebaceous cyst)

Chemodectoma (carotid body tumor)

Neurogenic tumor (neurofibroma, neurilemmoma)

Laryngeal tumor (chondroma)

Malignant neoplasms

Primary

Salivary gland tumor

Thyroid cancer

Upper aerodigestive tract cancer

Soft tissue sarcoma

Skin cancer (melanoma, squamous cell carcinoma, basal cell carcinoma)

Lymphoma

Metastatic

Upper aerodigestive tract cancer

Skin cancer (melanoma, squamous cell carcinoma)

Salivary gland tumor

Thyroid cancer

Adenocarcinoma (breast, gastrointestinal tract,
genitourinary tract, lung)

Unknown primary tumor

Table 1 Etiology of Neck Mass

Inflammatory and infectious disorders

Acute lymphadenitis (bacterial or viral infection)

Subcutaneous abscess (carbuncle)

Infectious mononucleosis

Cat-scratch fever

AIDS

Tuberculous lymphadenitis (scrofula)

Fungal lymphadenitis (actinomycosis)

Sarcoidosis

Congenital cystic lesions

Thyroglossal duct cyst

Branchial cleft cyst

Cystic hygroma (lymphangioma)

Vascular malformation (hemangioma)

Laryngocele

HISTORY

- ▶ **duration and growth rate of the mass are important:**
- ▶ **malignant lesions are more likely to grow rapidly**
- ▶ **benign ones, may grow slowly and sometimes shrink.**

HISTORY

- ▶ **location of the mass in the neck can also narrow the list of possibilities.**
- ▶ **This is particularly important for differentiating congenital masses from neoplastic or inflammatory ones because each type usually occurs in particular locations.**
- ▶ **location of a neoplasm has both diagnostic and prognostic significance.**

HISTORY

- ▶ **evaluate for evidence of infection or inflammation (e.g., fever, pain, or tenderness);**
- ▶ **a recent history of tuberculosis, sarcoidosis, or fungal infection;**
- ▶ **the presence of dental problems; and**
- ▶ **a history of trauma to the head and neck.**
- ▶ **Masses that appear inflamed or infected are far more likely to be benign.**

- ▶ **factors suggestive of cancer include**
- ▶ **a history of malignancy elsewhere in the head and neck (e.g., a history of skin cancer, melanoma, thyroid cancer, or head and neck cancer);**
- ▶ **night sweats (suggestive of lymphoma);**
- ▶ **excessive exposure to the sun (a risk factor for skin cancer);**
- ▶ **smoking or excessive alcohol consumption (risk factors for squamous cell carcinoma of the head and neck);**
- ▶ **nasal obstruction or bleeding, otalgia, odynophagia, dysphagia, or hoarseness (suggestive of a malignancy in the upper aerodigestive tract);**
- ▶ **exposure to low-dose therapeutic radiation (a risk factor for thyroid cancer).**

PHYSICAL EXAMINATION

- ▶ **The head and neck examination is challenging because much of the area to be examined is not easily seen.**
- ▶ **usually performed with the patient sitting in front of the physician.**
- ▶ **Constant repositioning of the head is necessary to obtain adequate visualization of the various areas.**
- ▶ **Gloves must be worn during the examination, particularly if the mucous membranes are to be examined.**
- ▶ **Good illumination is essential.**
- ▶ **Fiberoptic endoscopy with a flexible laryngoscope and a nasopharyngoscope is a common component of the physical examination for evaluating the larynx, the nasopharynx, and the paranasal sinuses, especially when these areas cannot be adequately inspected with other techniques.**

PHYSICAL EXAMINATION

- ▶ **The examination should begin with inspection for asymmetry, signs of trauma, and skin changes.**
- ▶ **The examiner should ask the patient to swallow to observe whether the mass moves with deglutition and should palpate the neck from both the front and behind.**
- ▶ **Auscultation can detect audible bruits.**
- ▶ **One should also both listen to and ask about the patient's voice, changes in which may suggest either a laryngeal tumor or recurrent nerve dysfunction from locally invasive thyroid cancer.**

PHYSICAL EXAMINATION

- ▶ **During the physical examination, one should be thinking about the following questions:**
- ▶ **What structure is the neck mass arising from?**
- ▶ **Is it a lymph node?**
- ▶ **Is the mass arising from a normally occurring structure, such as the thyroid gland, a salivary gland, a nerve, a blood vessel, or a muscle?**

PHYSICAL EXAMINATION

- ▶ **Is it arising from an abnormal structure, such as a laryngocele, a branchial cleft cyst, or a cystic hygroma?**
- ▶ **Is the mass soft, fluctuant, easily mobile, well encapsulated, and smooth?**
- ▶ **Or is it firm, poorly mobile, and fixed to surrounding structures?**
- ▶ **Does it pulsate?**
- ▶ **Is there a bruit?**
- ▶ **Does it appear to be superficial, or is it deeper in the neck?**
- ▶ **Is it attached to the skin?**
- ▶ **Is it tender?**

CERVICAL LYMPH NODES

- ▶ **The location,**
- ▶ **size, and**
- ▶ **consistency of lymph nodes furnish valuable clues to the nature of the primary disease.**
- ▶ **Other physical characteristics of the adenopathy should be noted as well,**
- ▶ **including the number of lymph nodes affected,**
- ▶ **their mobility,**
- ▶ **their degree of fixation, and**
- ▶ **their relation to surrounding anatomic structures.**
- ▶ **One can often establish a tentative diagnosis on the basis of these findings alone.**

- ▶ **soft or tender nodes are more likely to derive from an inflammatory or infectious condition.**
- ▶ **hard, fixed, painless nodes are more likely to represent metastatic cancer.**
- ▶ **Multiple regions of enlarged lymph nodes are usually a sign of systemic disease (e.g., lymphoma, tuberculosis, or infectious mononucleosis)**
- ▶ **solitary nodes are more often due to malignancy.**
- ▶ **Firm, rubbery nodes are typical of lymphoma.**

- ▶ **The submental and submandibular nodes (level I) are palpated bimanually. (Bidigitally)**
- ▶ **The three levels of internal jugular chain nodes (levels II, III, and IV) are best examined by gently rolling the sternocleidomastoid muscle between the thumb and the index finger.**
- ▶ **The posterior triangle nodes (level V) are palpated posterior to the sternocleidomastoid.**

SKIN

- ▶ **Careful examination of**
- ▶ **scalp,**
- ▶ **the ears,**
- ▶ **the face,**
- ▶ **the oral cavity, and**
- ▶ **the neck**
- ▶ **can identify potentially malignant skin lesions, which may give rise to lymph node metastases.**

THYROID GLAND

- ▶ **The thyroid gland is first observed as the patient swallows;**
- ▶ **it is then palpated and its size and consistency are assessed to determine whether**
- ▶ **it is smooth,**
- ▶ **diffusely enlarged, or**
- ▶ **nodular and**
- ▶ **whether one nodule or several are present.**
- ▶ **If it is unclear whether the mass arises from the thyroid, one can clarify the point by asking the patient to swallow and watching to see whether the mass moves upward with the larynx.**

THYROID GLAND

- ▶ **Signs of superior mediastinal syndrome (e.g., cervical venous engorgement and facial edema) suggest retrosternal extension of a thyroid goiter.**
- ▶ **Elevation of the arms above the head can elicit this finding in a patient with a substernal goiter (a positive Pemberton sign).**
- ▶ **The larynx and trachea are examined, with special attention to the cricothyroid membrane, over which Delphian nodes can be palpated.**
- ▶ **These nodes can be an indication of thyroid or laryngeal cancer.**

MAJOR SALIVARY GLANDS

- ▶ **Examination of the paired parotid and submandibular glands involves not only palpation of the neck but also an intraoral examination to inspect the duct openings.**
- ▶ **The submandibular glands are best assessed by bimanual palpation, with one finger in the mouth and one in the neck.**
- ▶ **They are normally lower and more prominent in older patients..**

MAJOR SALIVARY GLANDS

- ▶ **The parotid glands are often palpable in the neck, although the deep lobe cannot always be assessed.**
- ▶ **A mass in the region of the tail of the parotid must be distinguished from enlarged level II jugular nodes.**
- ▶ **The oropharynx is inspected for distortion of the lateral walls.**
- ▶ **The parotid (Stensen) duct may be found opening into the buccal mucosa, opposite the second upper molar**

ORAL CAVITY AND OROPHARYNX

- ▶ **The lips should be inspected and palpated.**
- ▶ **Dentures should be removed before the mouth is examined.**
- ▶ **The buccal mucosa, the teeth, and the gingiva are then inspected.**
- ▶ **The patient should be asked to elevate the tongue so that the floor of the mouth can be examined and bimanual inspection performed.**
- ▶ **The tongue should be inspected both in its normal position in the mouth and during protrusion.**

ORAL CAVITY AND OROPHARYNX

- ▶ **Most of the oropharyngeal contents are easily visualized if the tongue is depressed.**
- ▶ **Only the anterior two thirds of the tongue are clearly visible on examination, however.**
- ▶ **The base of the tongue is best inspected using a mirror.**
- ▶ **In most persons, the tongue base can be palpated, although with some discomfort to the patient.**
- ▶ **The ventral surface of the tongue must also be carefully inspected and palpated.**

ORAL CAVITY AND OROPHARYNX

- ▶ **The hard palate is examined by gently tilting the patient's head backward, and**
- ▶ **the soft palate is inspected by gently depressing the tongue with a tongue depressor .**
- ▶ **The movement of the palate is assessed by having the patient say "ahh."**

ORAL CAVITY AND OROPHARYNX

- ▶ **The tonsils are then examined.**
- ▶ **They are usually symmetrical but may vary substantially in size.**
- ▶ **For example, in young patients, hyperplastic tonsils may almost fill the oropharynx,**
- ▶ **but in adult patients, this is an uncommon finding.**
- ▶ **Finally, the posterior pharyngeal wall is inspected.**

LARYNX AND HYPOPHARYNX

- ▶ **The larynx and the hypopharynx are best examined by indirect or direct laryngoscopy.**
- ▶ **A mirror is warmed, and the patient's tongue is gently held forward to increase the space between the oropharyngeal structures.**
- ▶ **The mirror is carefully introduced into the oropharynx without touching the base of the tongue.**
- ▶ **The oropharynx, the larynx, and the hypopharynx can be inspected by changing the angle of the mirror.**

- ▶ **The lingual and laryngeal surfaces of the epiglottis are examined.**
- ▶ **Often the patient must be asked to phonate to bring the endolarynx into view.**
- ▶ **The aryepiglottic folds and the false and true vocal cords should be identified.**
- ▶ **The mobility of the true vocal cords is then assessed: their resting position is carefully noted, and their movement during inspiration is recorded.**



- ▶ **Normally, the vocal cords abduct during breathing and move to the median position during phonation.**
- ▶ **The larynx is elevated when the patient attempts to say "eeeeee";**
- ▶ **this allows one to observe vocal cord movement and**
- ▶ **to better visualize the piriform sinuses, the post-cricoid hypopharynx, the laryngeal surface of the epiglottis, and the anterior commissure of the glottic larynx.**

- ▶ **Passage of a fiberoptic laryngoscope through the nose yields a clear view of the hypopharynx and the larynx.**
- ▶ **This procedure is well tolerated by almost all patients,**
- ▶ **particularly if a topical anesthetic is gently sprayed into the nose and swallowed, thereby anesthetizing both the nose and the pharynx.**

NASAL CAVITY AND NASOPHARYNX

- ▶ **The nasopharynx is examined by depressing the tongue and inserting a small mirror behind the soft palate.**
- ▶ **The patient is instructed to open the mouth widely and breathe through it to elevate the soft palate.**
- ▶ **With the patient relaxed, a warmed nasopharyngeal mirror is carefully placed in the oropharynx behind the soft palate without touching the mucosa.**

NASAL CAVITY AND NASOPHARYNX

- ▶ **The nasal septum, the choanae, the turbinates, and the eustachian tube orifices are systematically assessed.**
- ▶ **The dorsum of the soft palate, the posterior nasopharyngeal wall, and the vault of the nasopharynx should also be inspected.**
- ▶ **The exterior of the nose should be carefully examined, and the septum should be inspected with a nasal speculum.**
- ▶ **Polyps or other neoplasms can be mistaken for turbinates.**

- ▶ **Careful evaluation of the cranial nerves is essential,**
- ▶ **as is examination of the eyes (including assessment of ocular movement and visual activity),**
- ▶ **the external ear, and**
- ▶ **the tympanic membrane.**

ADDITIONAL AREAS

- ▶ **The remainder of the physical examination is also important, particularly as regards the identification of a possible source of metastases to the neck.**
- ▶ **Other sets of lymph nodes—especially axillary and inguinal nodes—are examined for enlargement or tenderness.**
- ▶ **Women should undergo complete pelvic and rectal examination.**
- ▶ **Men should undergo rectal, testicular, and prostate examinations; tumors from these organs may metastasize to the neck, albeit rarely.**

DEVELOPING A DIFFERENTIAL DIAGNOSIS

- ▶ **Once a comprehensive history and examination have been performed, one is likely to have a better idea of the etiology of the mass.**
- ▶ **In some patients, the findings are clear enough to strongly suggest a specific disease entity.**
- ▶ **For example, a rapidly developing mass that is soft and tender to palpation is most likely a reactive lymph node from an acute bacterial or viral illness.**
- ▶ **A slow-growing facial mass associated with facial nerve deficits is probably a malignant parotid tumor.**

- ▶ **A thyroid nodule with an adjacent abnormal lymph node in a young patient probably represents thyroid cancer.**
- ▶ **In an elderly patient with a substantial history of smoking and alcohol use, a neck mass may be a metastasis from squamous cell carcinoma in the aerodigestive tract.**

- ▶ **The initial diagnostic impressions and the degree of certainty attached to them determine the next steps in the workup and management of a neck mass; options include**
- ▶ **empirical therapy,**
- ▶ **ultrasonographic scanning,**
- ▶ **computed tomography (CT),**
- ▶ **fine-needle aspiration (FNA), and**
- ▶ **observation alone.**

- ▶ **For example, in a patient with suspected bacterial lymphadenitis from an oral source, empirical antibiotic therapy with close follow-up is a reasonable approach.**
- ▶ **In a patient with a suspected parotid tumor,**
- ▶ **the best first test is a CT scan:**
- ▶ **the tumor probably must be removed, which means that one will have to ascertain the relation of the mass to adjacent structures.**
- ▶ **In a patient with suspected metastatic cancer, FNA is a sensible choice: it will confirm the presence of malignancy and may suggest a source of the primary cancer.**

INVESTIGATIVE STUDIES

- ▶ **Neck masses of suspected infectious or inflammatory origin can be observed for short periods.**
- ▶ **Most neck masses in adults, however, are abnormal and are often manifestations of serious underlying conditions.**
- ▶ **In most cases, therefore, further diagnostic evaluation should be rigorously pursued.**

ULTRASONOGRAPHY

- ▶ **Ultrasonography of the neck can be extremely useful in clarifying physical examination findings and supplying additional definitive information.**
- ▶ **In many clinics, ultrasonography is considered an extension of the physical examination and is applied for nearly all patients with neck masses.**
- ▶ **Ultrasonography can also be useful to guide tissue sampling and**
- ▶ **is helpful for mapping of normal or abnormal lymph nodes,**
- ▶ **for characterizing lesions as cystic or solid, and for**
- ▶ **defining the risk of some individual lesions (especially thyroid lesions) of being malignant.**
- ▶ **Ideally, point-of-care ultrasound examination by the treating physician can guide and clarify the subsequent evaluation.**

TISSUE SAMPLING

- ▶ **In many cases, biopsy establishes the diagnosis or, at least, reduces the diagnostic possibilities.**
- ▶ **At present, the preferred method of obtaining biopsy material from a neck mass is FNA,**
- ▶ **which is generally well tolerated and**
- ▶ **can usually be performed without local anesthesia.**
- ▶ **Although FNA is, on the whole, both safe and accurate, it is an invasive diagnostic procedure and carries a small but definable risk of potential problems (e.g., bleeding and sampling error).**
- ▶ **Accordingly, FNA should be done only when the results are likely to influence management.**

FNA

- ▶ **Benign FNA results should not be considered the end point of any search and do not rule out cancer.**
- ▶ **Several studies have shown FNA to be approximately 90% accurate in establishing a definitive diagnosis.**
- ▶ **Lateral cystic neck masses that collapse on aspiration usually represent**
 - ▶ **hygromas,**
 - ▶ **branchial cleft cysts, or**
 - ▶ **cystic degeneration of a metastatic papillary thyroid cancer,**

FNA

- ▶ **If both cystic and solid components are evident on a sonogram, or**
- ▶ **if a palpable mass remains after cyst aspiration,**
- ▶ **then tissue sampling should target the solid component as the morphology of the cells will be better preserved.**

OPEN BIOPSY

- ▶ **If a complete physical examination including ultrasonography has been completed and the FNA is not diagnostic,**
- ▶ **then an open biopsy may be necessary to obtain a specimen for histologic sections and microbiologic studies.**
- ▶ **open biopsy eventually proves necessary in about 10% of patients with a malignant mass.**
- ▶ **For an open biopsy, it is important to orient skin incisions within the boundaries of a neck dissection;**
- ▶ **the incisions can then, if necessary, be extended for definitive therapy or reexcised if reoperation subsequently proves necessary.**

IMAGING

- ▶ **Diagnostic imaging beyond ultrasound studies should be used selectively in the evaluation of a neck mass;**
- ▶ **imaging studies should be performed only if the results are likely to affect subsequent therapy.**
- ▶ **Such studies often supply useful information about the location and characteristics of the mass and its relation to adjacent structures.**
- ▶ **Diagnostic imaging is particularly useful when a biopsy has been performed and a malignant tumor identified.**
- ▶ **In such cases, these studies can help establish the extent of local disease and the presence or absence of metastases.**

CT AND MRI

- ▶ **CT is useful for differentiating cysts from solid neck lesions and for determining whether a mass is within or outside a gland or nodal chain.**
- ▶ **In addition, CT can delineate small tongue base or tonsillar tumors that have a minimal mucosal component.**
- ▶ **Magnetic resonance imaging (MRI) provides much the same information as CT.**
- ▶ **T 2 -weighted gadolinium-enhanced scans are particularly useful for delineating the invasion of soft tissue by tumor: endocrine tumors are often enhanced on such scans.**

FDG PET SCAN

- ▶ **Fluorodeoxyglucose (FDG) positron emission tomography (PET) is increasingly employed in the diagnosis and staging of both primary and metastatic head and neck malignancies, including**
- ▶ **squamous cell carcinoma, thyroid cancer, lymphoma, and melanoma.**
- ▶ **FDG-PET is generally reserved for specific situations, however, rather than as a primary imaging modality.**
- ▶ **FDG-PET-positive, radioiodine-negative, metastatic thyroid cancers are more aggressive than their radioiodine-avid counterparts, for example.**

ARTERIOGRAPHY

- ▶ **Arteriography is useful mainly for evaluating vascular lesions and tumors fixed to the carotid artery.**
- ▶ **Angiography is helpful for evaluating the vascularity of a mass, its specific blood supply, or the status of the carotid artery but provides very little information about the physical characteristics of the mass.**
- ▶ **Plain radiographs of the neck are rarely helpful in differentiating neck masses,**
- ▶ **but a chest x-ray can often confirm a diagnosis (e.g., in patients with lymphoma, sarcoidosis, or metastatic lung cancer).**

MANAGEMENT OF SPECIFIC DISORDERS

▶ CERVICAL ADENOPATHY

Table 2 Classification of Cervical Lymph Nodes

<i>Level</i>	<i>Nodes</i>	<i>Common Sources of Metastatic Disease</i>
I	Submental nodes Submandibular nodes	Oral cavity and lip, facial skin
II	Upper internal jugular chain nodes	Oropharynx, larynx, hypopharynx
III	Middle internal jugular chain nodes	Oropharynx, larynx, hypopharynx
IV	Lower internal jugular chain nodes	Upper aerodigestive tract, thyroid
V	Spinal accessory nodes Transverse cervical nodes	Remote metastases (Virchow node); posterior scalp
VI	Tracheoesophageal groove nodes	Thyroid, larynx

SURGICAL ANATOMY

- ▶ **The lymph nodes of the neck are typically divided into six levels' based on common patterns of metastatic spread.**
- ▶ **These six levels correspond to the**
- ▶ **submandibular and submental nodes (level I),**
- ▶ **jugular nodes (levels II to IV),**
- ▶ **posterior triangle nodes (level V), and**
- ▶ **anterior triangle nodes (level VI).**

LEVEL 1

- ▶ **The boundaries of level I are**
- ▶ **the mandible superiorly,**
- ▶ **the anterior belly of the digastric muscle anteriorly, and**
- ▶ **the stylohyoid muscle posteriorly.**
- ▶ **Malignant nodes in this level most commonly contain metastases from cancers of the lips, the oral cavity, or the facial skin.**

LEVEL II

- ▶ **Level II contains nodes located near the upper third of the internal jugular vein.**
- ▶ **The anterior boundary of level II is the stylohyoid muscle;**
- ▶ **the posterior boundary is the posterior border of the sternocleidomastoid.**
- ▶ **Level II extends inferiorly to the level of the hyoid bone.**

LEVEL III

- ▶ **Level III relates to the middle third of the jugular vein.**
- ▶ **The superior border is the hyoid bone,**
- ▶ **the inferior border is the level of the cricoid cartilage, and**
- ▶ **the anterior and posterior borders are the sternohyoid and sternocleidomastoid muscles, respectively.**
- ▶ **Level II and level III lymph nodes are common sites for lymph node metastases from primary cancers of the oropharynx, the larynx, and the hypopharynx.**

LEVEL IV

- ▶ **Level IV contains nodes relating to the lower third of the internal jugular vein.**
- ▶ **the anterior and posterior borders are the sternohyoid and sternocleidomastoid muscles, respectively.**
- ▶ **the superior border is the cricoid cartilage, and**
- ▶ **the inferior border is the superior edge of the clavicle.**
- ▶ **Metastases in level IV lymph nodes can arise from cancers of the upper aerodigestive tract, cancers of the thyroid gland, or cancers arising below the clavicle.**

LEVEL V

- ▶ **Level V consists of the posterior triangle of the neck and contains several nodal groups:**
- ▶ **the spinal accessory,**
- ▶ **transverse cervical,**
- ▶ **and supraclavicular nodes.**
- ▶ **Nodal metastases in the posterior triangle can arise from nasopharyngeal and thyroid cancers and from squamous cell carcinoma or melanoma of the posterior scalp and the pinna of the ear.**

LEVEL V

- ▶ **The eponymous Virchow node in the left supraclavicular region is a common site of distant metastasis.**
- ▶ **The anterior border of level V is the sternocleidomastoid;**
- ▶ **the posterior border is the anterior edge of the trapezius muscle.**
- ▶ **Level V extends**
- ▶ **superiorly from the point at which the sternocleidomastoid and trapezius converge**
- ▶ **Upto the clavicle inferiorly.**

LEVEL VI

- ▶ **Level VI contains the lymph nodes of the anterior compartment of the neck.**
- ▶ **The borders are the**
- ▶ **hyoid superiorly and**
- ▶ **the sternal notch inferiorly, and**
- ▶ **this level extends laterally to the carotid arteries on each side.**
- ▶ **Nodes in level VI commonly contain metastases from thyroid cancer, as well as from laryngeal cancers.**

INVESTIGATIVE AND DIAGNOSTIC STUDIES

- ▶ **Acute infection of the neck (cervical adenitis) is most often the result of dental infection, tonsillitis, pharyngitis, viral upper respiratory tract infection, or skin infection.**
- ▶ **In this situation, the enlarged lymph nodes are usually just posterior and inferior to the angle of the mandible.**
- ▶ **Signs of acute infection (e.g., fever, malaise, and a sore mouth or throat) are usually present.**
- ▶ **A constitutional reaction, tenderness of the cervical mass, and the presence of an obvious infectious source confirm the diagnosis.**
- ▶ **Treatment should be directed toward the primary disease and should include a monospot test for infectious mononucleosis.**

- ▶ **For patients with cervical adenopathy without an obvious acute infection, further investigation is indicated.**
- ▶ **Various chronic infections (e.g., tuberculosis, fungal lymphadenitis, syphilis, cat-scratch fever, and AIDS) may also involve cervical lymph nodes.**
- ▶ **Certain chronic inflammatory disorders (e.g., sarcoidosis) may present with cervical lymphadenopathy as well.**
- ▶ **Because of the chronic lymph node involvement, these conditions are easily confused with neoplasms, especially lymphomas.**
- ▶ **Biopsy is occasionally necessary;**
- ▶ **however, skin tests and serologic studies are often more useful for establishing a diagnosis.**
- ▶ **Treatment of these conditions is primarily medical; surgery is reserved for complications.**

- ▶ **In adult patients with cervical adenopathy and no clear infectious etiology, there is a high risk of malignancy, and FNA is recommended.**
- ▶ **FNA may provide a conclusive diagnosis or further reduce the range of diagnostic possibilities.**
- ▶ **FNA is also useful in patients with a known distant malignancy in whom confirmation of metastases is needed for staging and for planning therapy,**
- ▶ **as well as in patients with a primary tumor of the head and neck who are not candidates for operation but in whom a tissue diagnosis is necessary for appropriate nonsurgical therapy to be initiated.**
- ▶ **A wide variety of primary tumors may metastasize to the cervical lymph nodes, and therapy depends on the primary site and the type and stage of the tumor.**
- ▶ **FNA of an enlarged cervical node does have limitations.**
- ▶ **Sampling error or an inadequate sample may occur; in these cases, a repeat aspiration or an excisional biopsy may be useful.**

- ▶ **When lymphoma and metastatic squamous cell carcinoma are diagnostic possibilities,**
- ▶ **FNA alone is often incapable of determining the precise histologic subtype for lymphoma,**
- ▶ **but it is usually capable of distinguishing a lymphoproliferative disease from metastatic squamous cell carcinoma.**
- ▶ **This is a crucial distinction in that the two neoplasms are treated in drastically different ways.**

- ▶ **If a lymphoma is suspected,**
- ▶ **FNA is typically followed by open biopsy,**
- ▶ **frozen-section confirmation, and**
- ▶ **submission of fresh tissue for further pathologic characterization.**

- ▶ **The intact node is placed in normal saline and sent directly to the pathologist for analysis of cellular content and nodal architecture and identification of lymphocyte markers.**

- ▶ **If, however, metastatic squamous cell carcinoma is suspected,**
- ▶ **FNA usually suffices for establishing the diagnosis and formulating a treatment plan,**
- ▶ **which is specific to the site and size of the primary tumor but often includes chemotherapy and radiation initially.**
- ▶ **In this setting, performing an open biopsy can lead to significant wound healing complications;**
- ▶ **there is no need to incur this risk when FNA is sufficient to initiate treatment.**

CONGENITAL NECK MASS

▶ *Thyroglossal Duct Cyst*

- ▶ **Thyroglossal duct cysts are remnants of the tract along which the thyroid gland descended into the neck from the foramen cecum.**
- ▶ **They account for about 70% of all congenital abnormalities of the neck.**
- ▶ **Thyroglossal duct cysts may be found in patients of any age but are most common in the first decade of life.**
- ▶ **They may present as a lone cyst,**
- ▶ **a cyst with a sinus tract, or**
- ▶ **a solid core of thyroid tissue.**

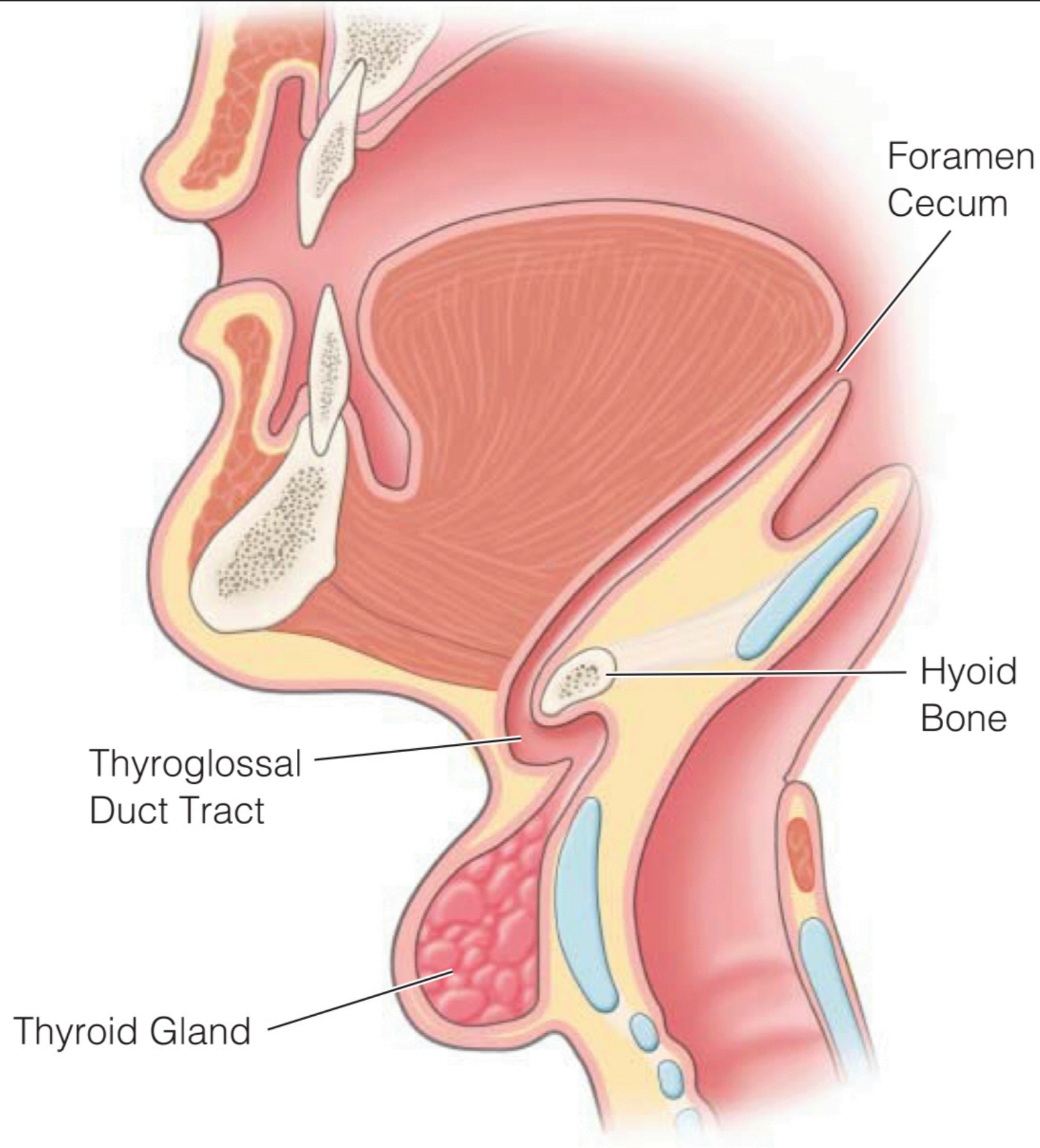


Figure 3 The course of the thyroglossal duct from the foramen cecum to the pyramidal lobe of the thyroid gland. The operative treatment of thyroglossal duct abnormalities includes removal of the central portion of the hyoid bone to ensure complete tract removal, thus limiting the risk of recurrence.



Figure 47.54 A patient with a thyroglossal fistula from a cyst in the midline of the neck.

- ▶ **They may be so small as to be barely perceptible,**
- ▶ **as large as a grapefruit, or**
- ▶ **anything in between.**
- ▶ **Thyroglossal duct cysts are almost always found in the midline,**
- ▶ **at or below the level of the hyoid bone;**
- ▶ **they may be situated anywhere from the base of the tongue to the suprasternal notch.**
- ▶ **They occasionally present slightly lateral to the midline and are sometimes associated with an external fistula to the skin of the anterior neck.**
- ▶ **They are often ballotable and can usually be moved slightly from side to side but not up or down;**
- ▶ **they do move up and down when patients swallow or protrude the tongue.**

- ▶ **Thyroglossal duct cysts must be differentiated from**
- ▶ **dermoid cysts,**
- ▶ **lymphadenopathy in the anterior jugular chain, and**
- ▶ **cutaneous lesions (e.g., lipomas and sebaceous cysts).**

- ▶ **Operative treatment is almost always required,**
- ▶ **not only because of cosmetic considerations but also because of**
- ▶ **the high incidence of recurrent infection,**
- ▶ **including abscess formation.**
- ▶ **About 1% of thyroglossal duct cysts contain cancer;**
- ▶ **papillary cancer is the neoplasm most commonly encountered,**
- ▶ **followed by squamous cell carcinoma.**
- ▶ **About 25% of patients with papillary thyroid cancer in thyroglossal duct cysts have papillary thyroid cancer in other parts of the thyroid gland as well.**
- ▶ **About 10% have nodal metastases, which in some cases are bilateral.**

BRANCHIAL CLEFT CYST

- ▶ **Branchial cleft cysts are vestigial remnants of the fetal branchial apparatus from which all neck structures are derived.**
- ▶ **Early in embryonic development, there are five branchial arches and four grooves (or clefts) between them.**
- ▶ **The internal tract or opening of a branchial cleft cyst is situated at the embryologic derivative of the corresponding pharyngeal groove,**
- ▶ **such as the tonsil (second arch) or**
- ▶ **the piriform sinus (third and fourth arches).**
- ▶ **The second arch is the most common area of origin for such cysts.**
- ▶ **The position of the cyst tract is also determined by the embryologic relation of its arch to the derivatives of the arches on either side of it.**

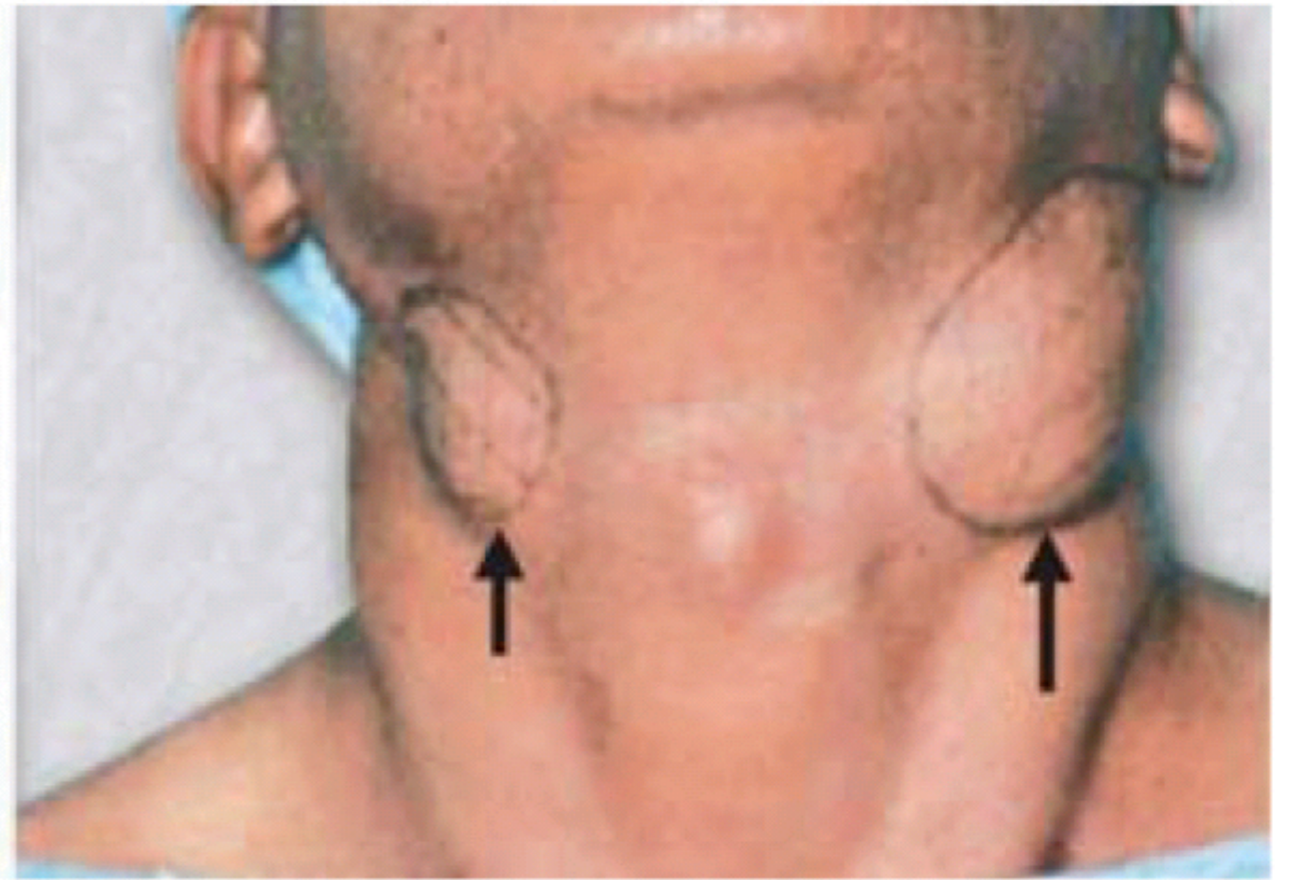
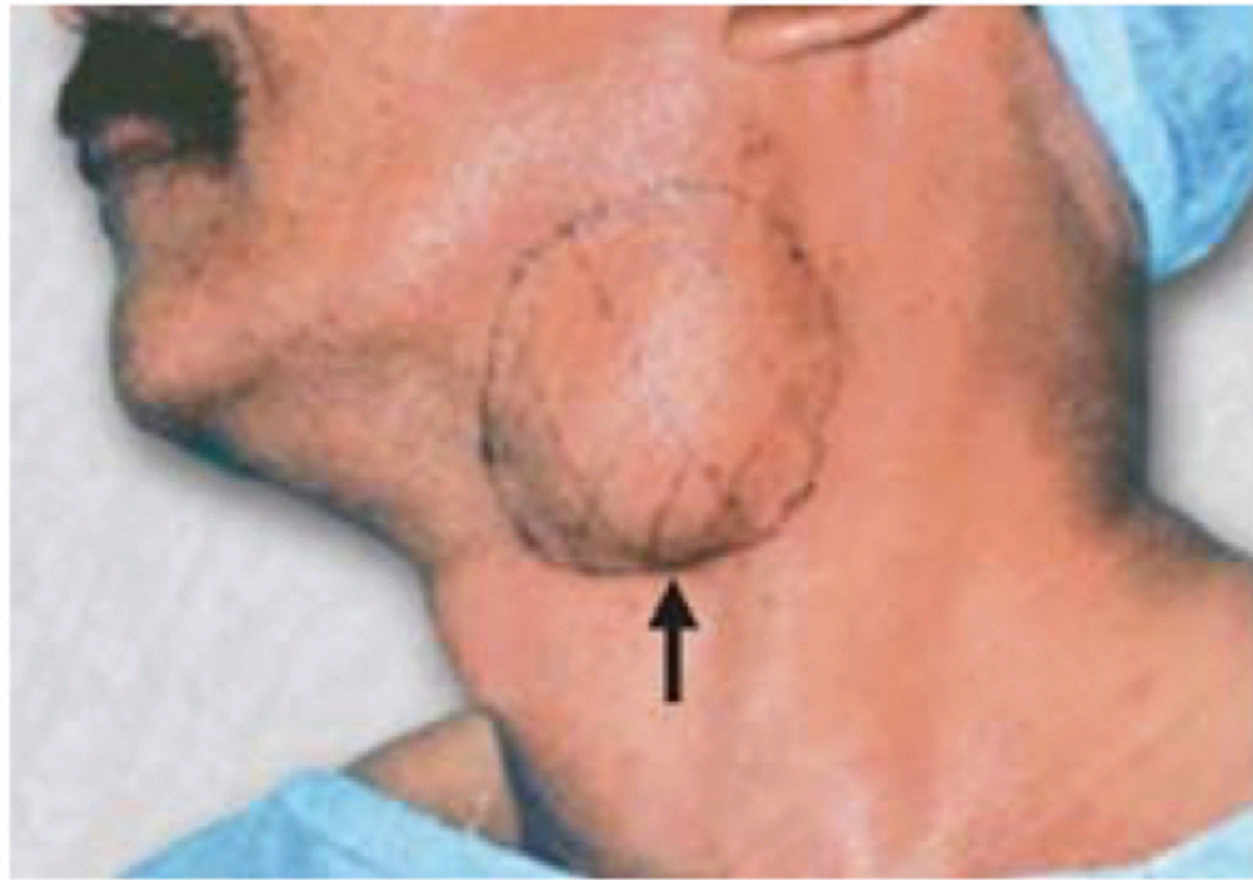
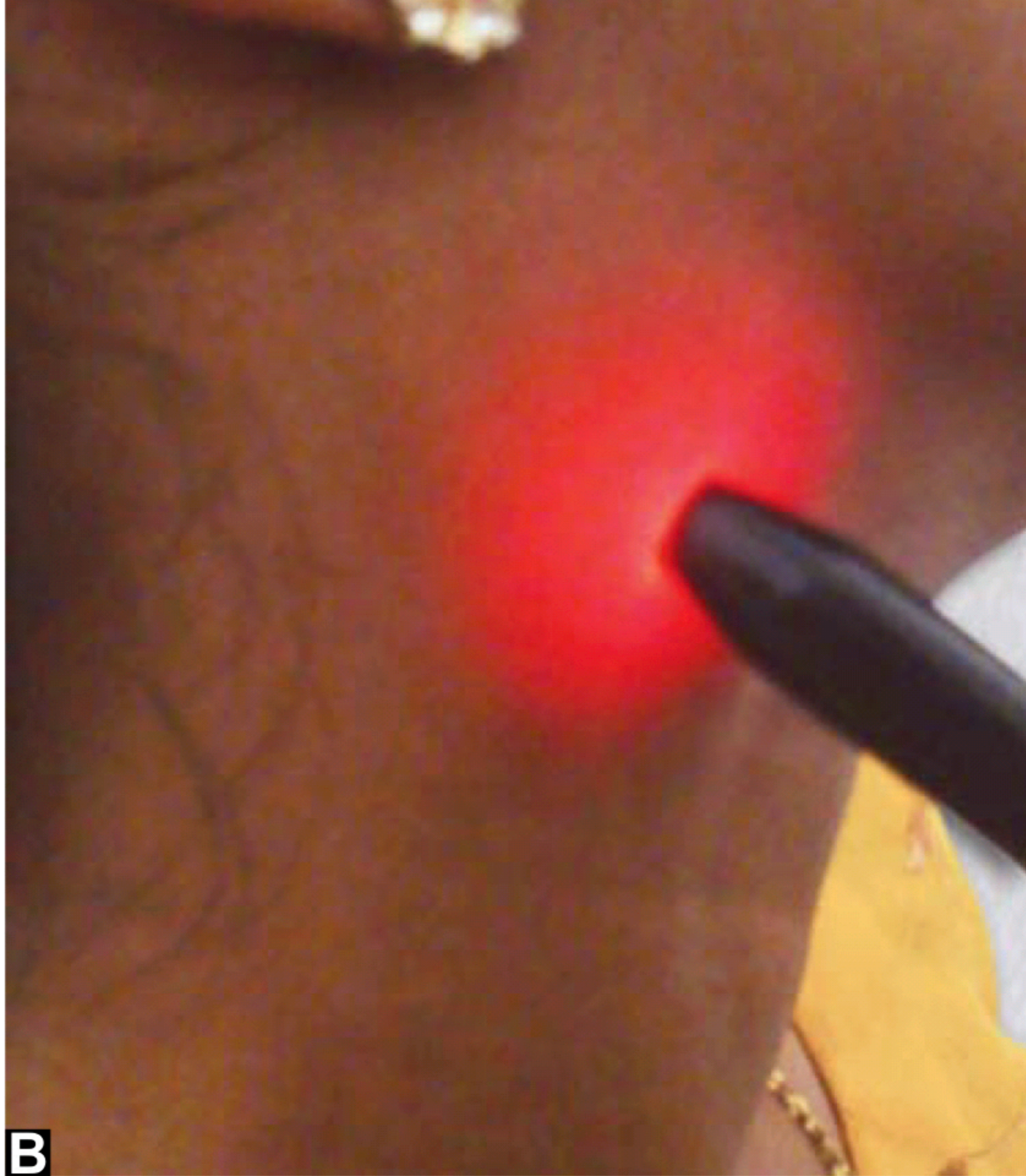


Fig. 5.11: Branchial cyst—both sides.



A



B

- ▶ **The majority of branchial cleft cysts (those that develop from the second, third, and fourth arches)**
- ▶ **tend to present as a bulge along the anterior border of the sternocleidomastoid muscle,**
- ▶ **with or without a sinus tract.**
- ▶ **Branchial cleft cysts may become symptomatic at any age,**
- ▶ **but most are diagnosed in the first two decades of life.**

- ▶ **They often present as a smooth, painless, slowly enlarging mass in the lateral neck.**
- ▶ **Frequently, there is a history of fluctuating size and intermittent tenderness.**
- ▶ **The diagnosis is more obvious when there is an external fistulous tract and there is a history of intermittent discharge.**
- ▶ **Infection of the cyst may be the reason for the first symptoms.**

- ▶ **Treatment consists of complete surgical removal of the cyst and the sinus tract.**
- ▶ **Any infection or inflammation should be treated and allowed to resolve before the cyst and the tract are removed.**

CYSTIC HYGROMA (LYMPHANGIOMA)

- ▶ **A cystic hygroma is a lymphangioma that arises from lymph channels in the neck.**
- ▶ **Almost always, this condition is first noted by the second year of life;**
- ▶ **on rare occasions, it is first diagnosed in adulthood.**
- ▶ **A cystic hygroma may present as a relatively simple thin-walled cyst**
- ▶ **in the floor of the mouth or**
- ▶ **may involve all the tissues from the floor of the mouth to the mediastinum.**



Figure 47.53 Cystic hygroma.

- ▶ **About 80% of the time,**
- ▶ **there is only a painless cyst in the posterior cervical triangle or**
- ▶ **in the supraclavicular area.**
- ▶ **A cystic hygroma can also occur, however,**
- ▶ **at the root of the neck,**
- ▶ **in the angle of the jaw (where it may involve the parotid gland), and**
- ▶ **in the midline (where it may involve the tongue, the floor of the mouth, or the larynx).**

- ▶ **The typical clinical picture is of a**
- ▶ **diffuse, soft, doughy, irregular mass**
- ▶ **that is readily transilluminated.**
- ▶ **Cystic hygromas look and feel somewhat like lipomas**
- ▶ **but have less well-defined margins.**
- ▶ **Aspiration of a cystic hygroma yields straw-colored fluid.**

- ▶ **They may be confused with**
- ▶ **angiomas (which are compressible),**
- ▶ **pneumatocèles from the apex of the lung, or**
- ▶ **aneurysms.**
- ▶ **They can be distinguished from vascular lesions by arteriography.**
- ▶ **On occasion, a cystic hygroma grows suddenly as a result of an upper respiratory tract infection, infection of the hygroma itself, or hemorrhage into the tissues.**
- ▶ **If the mass becomes large enough, it can compress the trachea or hinder swallowing.**

- ▶ **In the absence of pressure symptoms (i.e., obstruction of the airway or interference with swallowing) or gross deformity,**
- ▶ **cystic hygromas may be treated expectantly.**
- ▶ **They tend to regress spontaneously;**
- ▶ **if they do not, complete surgical excision is indicated.**
- ▶ **Excision can be difficult because of the numerous satellite extensions that often surround the main mass**
- ▶ **and because of the association of the tumor with vital structures such as the cranial nerves.**
- ▶ **Recurrences are common;**
- ▶ **staged resections for complete excision are often necessary.**

VASCULAR MALFORMATION (HEMANGIOMA)

- ▶ **Hemangiomas are usually considered congenital because**
- ▶ **they either are present at birth or**
- ▶ **appear within the first year of life.**

HEMANGIOMA

- ▶ **They have a number of characteristic findings–**
- ▶ **bluish-purple coloration,**
- ▶ **increased warmth,**
- ▶ **compressibility followed by refilling,**
- ▶ **bruit, and thrill–**
- ▶ **Easy to distinguish them from other head and neck masses.**
- ▶ **Angiography is diagnostic but is rarely indicated.**

HEMANGIOMA

- ▶ **Given that most of these congenital lesions resolve spontaneously,**
- ▶ **the treatment approach of choice is observation alone**
- ▶ **unless there is rapid growth,**
- ▶ **thrombocytopenia, or**
- ▶ **involvement of vital structures.**
- ▶ **Surgical excision May be difficult and is reserved for those that cannot be embolised or clipped or sclerosed.**

Patient presents with a neck mass

Obtain clinical history

Determine

- Duration and growth rate of mass
- Location of mass

Ask about

- Factors suggestive of infection or inflammatory disorder
- Factors suggestive of cancer

Perform physical examination of head and neck

Look for

- Asymmetry
- Signs of trauma
- Skin changes
- Movement of mass on deglutition
- Bruit
- Vocal changes

Attempt to determine source of mass, and assess its physical characteristics. Examine the following areas in detail:

- Cervical lymph nodes
- Skin
- Thyroid
- Salivary glands
- Oral cavity and oropharynx
- Larynx and hypopharynx
- Nasal cavity and nasopharynx

Formulate initial diagnostic impressions

Diagnosis is probable, and further diagnostic investigation is unnecessary

Diagnosis is uncertain, or further information is needed or desired

Consider investigative studies:
Biopsy: Fine-needle aspiration (FNA) is preferred method.
Imaging studies: Not routinely called for, but ultrasonography, CT, MRI, arteriography, angiography, and plain x-rays are sometimes helpful. Consultation with a head and neck radiologist is desirable.

Diagnosis is probable, and further diagnostic investigation is unnecessary

Diagnosis is uncertain, or further information is needed or desired

Consider investigative studies:
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Imaging studies: Not routinely called for, but ultrasonography, CT, MRI, arteriography, angiography, and plain x-rays are sometimes helpful. Consultation with a head and neck radiologist is desirable.

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- Signs of trauma
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FNA is diagnostic or confirmatory

FNA yields negative or inconclusive results

Repeat FNA or perform open biopsy.

FNA is diagnostic or confirmatory

FNA yields negative or inconclusive results

Repeat FNA or perform open biopsy.

Inflammatory or infectious disorder

Treat medically.
Drain abscesses.

Congenital cystic lesion

These include

- Thyroglossal duct cysts and branchial cleft cysts (treated surgically)
- Cystic hygromas and hemangiomas (treated expectantly)

Benign neoplasm

These include

- Salivary gland tumors
- Thyroid nodules and goiters
- Soft tissue tumors
- Chemodectomas
- Neurogenic tumors
- Laryngeal tumors

Treat surgically. (Observation is appropriate in some cases.)

Malignant neoplasm

Determine whether cancer is primary or metastatic.

Primary neoplasm

These include

- Lymphoma
- Thyroid cancer
- Upper aerodigestive tract cancer
- Soft tissue sarcoma
- Skin cancer

Treat with surgery, radiation therapy, and/or chemotherapy, as appropriate.

Metastatic tumor

Metastatic tumor

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graph TD; A[Metastatic tumor] --> B[Primary is known]; A --> C[Primary is unknown];
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Primary is known

Metastatic squamous cell carcinoma: Perform selective neck dissection and consider adjuvant radiation therapy.

Metastatic adenocarcinoma: Perform neck dissection (selective or other) and consider adjuvant radiation therapy.

Metastatic melanoma: Perform full-thickness excision and SLN biopsy; if there are positive SLNs or lymph nodes are palpable, perform modified neck dissection.

Primary is unknown

Evaluate nasopharynx, larynx, esophagus, hypopharynx, and tracheobronchial tree endoscopically.

Biopsy nasopharynx, tonsils, and hypopharynx.

Perform unilateral neck dissection followed by irradiation of neck, entire pharynx, and nasopharynx.