# Initial Evaluation of Adult Neck Masses

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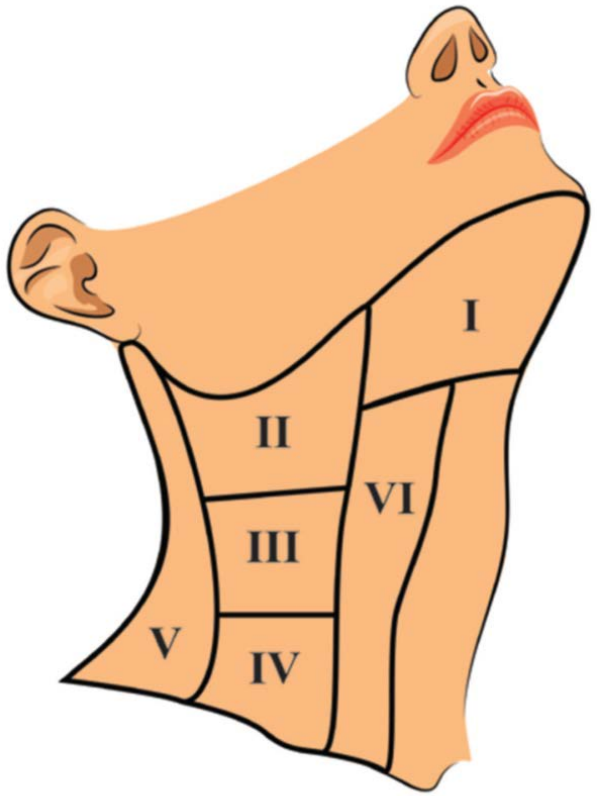
# Disclosures

- No affiliations to disclose

# Evaluation of Neck Masses

- Neck masses are quite common
  - About 60,000 adults will present with a neck mass yearly
  - 30,000 of these will be malignant
  - 550,000 malignancies world wide
- Roughly 50% of adult neck masses (over age 40) are malignant
  - 80% of non-thyroid neck masses in adults are neoplastic
    - 80% of these masses are malignant
  - Pediatric neck masses have 90% probability of being benign

# Anatomy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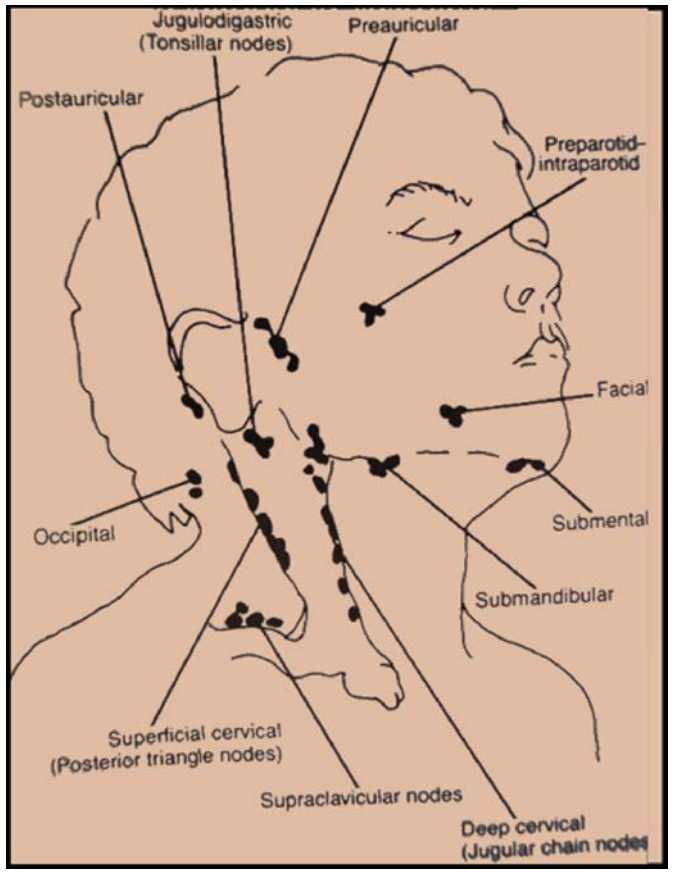

Jugulodigastric
(Tonsillar nodes)
Preauricular
Postauricular
Preparotid–
intraparotid
Facial
Submental
Occipital
Submandibular
Superficial cervical
(Posterior triangle nodes)
Supraclavicular nodes
Deep cervical
(Jugular chain nodes

# Anatomy

- There are several normal anatomic findings which are often confused as a neck mass
  - Transverse process of C1, which is palpable between the mastoid process and the angle of the mandible
  - The hyoid bone
  - The carotid bulb, particularly if it is atherosclerotic – can be firm and more prominent as the carotid becomes more torturous with aging
  - Ptotic/prominent submandibular salivary glands.

# Differential Diagnosis

- The differential diagnosis is very large (we are not going to cover them all)
  - Timing, location, patient age, exam all help to narrow down your initial diagnosis
  - Acute and chronic infectious/inflammatory
  - Congenital
  - Neoplastic

# Infectious

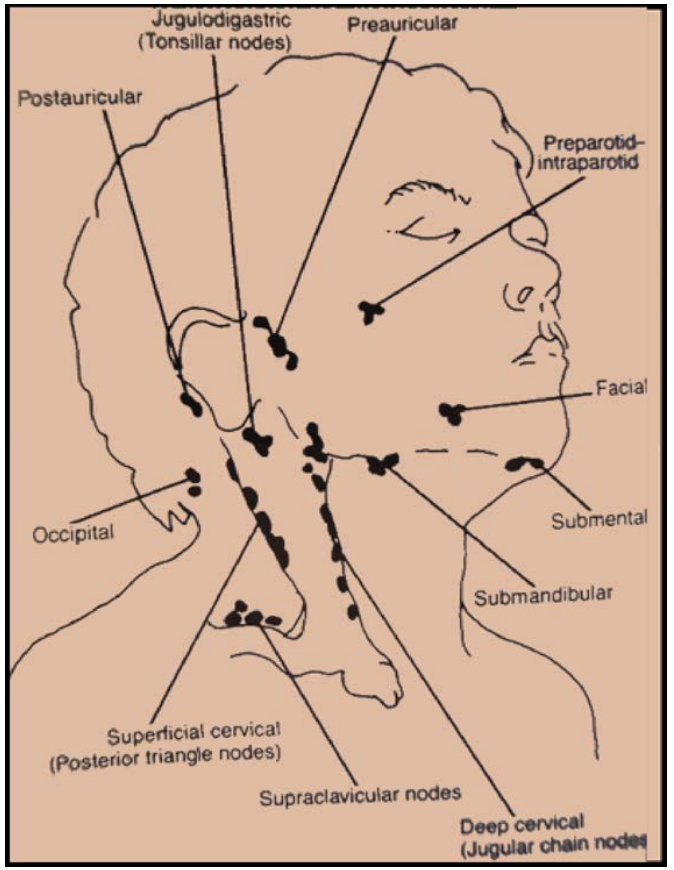
- Acute lymphadenitis
  - Acute onset with multiple, smooth, mobile, non matted, tender lymph nodes (submandibular or anterior cervical regions). Fever, systemic illness
  - Most commonly bacterial infection of the oral cavity/oropharynx, or skin of face/scalp or neck
    - Tonsillitis, pharyngitis, impetigo of the scalp due commonly to G+ organisms - Staph aureus, Streptococcus
  - Initial treatment with antibiotics often results in resolution
  - Without (and with) treatment, the lymph nodes develop abscess formation requiring surgical drainage.
- Viral infections Epstein-Barr virus (EBV)
  - Cytomegalovirus (CMV), herpes
  - Simplex virus (HSV) with enlarged submental nodes
  - Other viruses causing URTI with mild cervical lymphadenitis

# Infectious

- Acute lymphadenitis should resolve in a period of about 4 weeks
- Nodes approaching 2 cm in size or lasting 2 weeks beyond infection resolution merit further evaluation
- Chronic lymphadenitis
  - Tuberculosis,
  - Atypical mycobacterial infections
  - Cat scratch disease
  - HIV, which is often associated with Tb, lymphoma

# Infectious

- Face, anterior scalp, forehead drain into facial, pre-auricular, submental LNs
- Tonsils, posterior pharynx drain into jugulo-digastric, deep cervical LNs
- Posterior scalp, back of ear, external ear drain into posterior superficial cervical, posterior auricular, occipital LNs



# Common Congenital Masses

- Branchial Cysts and Sinuses
  - 20 percent of pediatric neck masses, less commonly found in adults past the age of 20
  - Generally present as a lateral mass at the upper 1/3$^{rd}$ of the sternocleidomastoid muscle
- Thyroglossal duct cyst
  - Midline, level of the hyoid, moves with tongue protrusion
- Dermoid and epidermoid cyst
  - Represent ectodermal elements, which where trapped beneath the skin
  - Epidermoid cysts contain sebaceous material within the cyst cavity
- Vascular – Lymphangioma/Hemangioma
  - Congenital malformations of vascular or lymphatic tissue present as a soft, smooth, non-tender mass that is compressible and can be trans-illuminated (lymphatic).
- **Often see a sudden enlargement after an upper respiratory infection in an adult**

# Neoplastic

- Malignant neck masses
  - Tend to have a history of progressive enlargement
  - Most commonly squamous cell carcinoma of the upper aerodigestive tract
    - More than 80% of these tumors are associated with tobacco and alcohol use in persons over 40 years of age
    - Nodes are firm, fixed, *usually* non-tender
    - Voice change, odynophagia, dysphagia, hemoptysis, weight loss
  - Thyroid masses
    - Midline, 93% benign. Malignancies are generally indolent well differentiated cancers
    - Risk factors for malignancy are family history and history of radiation exposure

# Neoplastic

- Malignant neck masses
  - Lymphoma
    - Multiple firm, rubbery lymph nodes
    - “B” signs of fatigue, night sweats
  - HPV related cancers
    - Seen more commonly
    - **Most common presentation is isolated cystic neck mass near the angle of the mandible**
    - Most common source is a tonsil/base of tongue lesion

# Neoplastic

- Salivary tumors
  - Parotid masses
    - 80% benign
  - Submandibular masses
    - 50% malignant
  - Sublingual/minor salivary masses
    - 80% malignant
  - Sialoalithiasis will present as a fluctuating swelling with eating
- Cutaneous malignancies
  - Majority are squamous cell of the skin or melanoma
  - “T-region” of midface and extending to the ears are at higher risk for metastatic spread

# Neoplastic

- Metastases from infra-clavicular primary tumor — lung, esophagus, stomach
  - Generally present as a supraclavicular mass
  - Lower level neck masses should raise concern for possible lung, GI tract malignancy

# Initial Approach

- Good history and physical exam as always are the key elements for evaluation
  - Key elements include
    - Tobacco use
    - Occupational exposures (woodworking, radiation, animals)
    - Family history (lymphomas, thyroid cancer, melanoma)
    - Significant sun exposures
    - Symptoms of infection or skin lesions
    - Swallowing/speech/breathing changes
      - Malignancies generally have insidious onset and are generally not intermittent
  - Timing
    - Acute vs Chronic
    - Length of time since onset
      - **Inflammatory nodes should be resolving after4 weeks**

# Initial Approach

- Exam
  - Size, location, consistency, tenderness and mobility of the mass
    - **2 cm or larger**
    - Posterior neck/anterior neck/submental/upper neck/supraclavicular
    - Fixed/matted nodes
    - Movement with swallowing (thyroid/TGDC) or tongue protrusion (TGDC)
  - **The scalp and skin of the head and neck should be examined for primary cutaneous lesions**
  - **Associated changes in CN function/parasthesias**
  - **Oral exam including dentition, floor of mouth/tongue, and tonsils/posterior pharynx**

# Initial Approach

- Patients with symptoms of infection with associated acute or chronic lymphadenenitis should be appropriately treated with antibiotics
  - 1 - 2 weeks is a reasonable treatment choice when mass is associated with fever, pain, erythema, or a history of recent infection.
  - **Patients without signs of infection should NOT be routinely placed on antibiotics**
- Patient at high risk for malignancy
  - Lack of infectious etiology
  - Fixation to adjacent tissues, and/or ulceration of overlying skin
  - Firm consistency
  - Size greater than 1.5 – 2 cm lack of infectious etiology,
  - **2-weeks or greater duration of mass**

# Initial Approach

- Infectious work-up can include
  - Complete blood count (CBC) with differential
  - Erythrocyte sedimentation rate (ESR) and/or C-reactive protein (CRP)
  - Blood culture (for febrile patients)
  - Epstein-Barr virus (EBV) or Cytomegalovirus (CMV) serology (when adenopathy is diffuse)
  - HIV serology (in patients with increased risk)
- Specific serologic tests can be ordered when there is an increased index of suspicion for disease based on exposure, history, and examination:
  - Serology for Toxoplasma gondii, brucellosis, Bartonella, tularemia
  - Tuberculin skin test

# Further Assessment

- **Contrasted CT of the neck**
  - **For neck masses in patients identified as being at higher risk for malignancy a contrasted CT of the neck is warranted**
  - MRI if radiation is a concern
- Utrasound
  - Thyroid nodules (best modality)
  - Inflammatory masses suspected to contain an abscess
  - Need to reduce radiation exposure/low risk (pediatric patients)
- Submandibular view X-ray can be used to evaluate for sialolithiasis

# Further Assessment

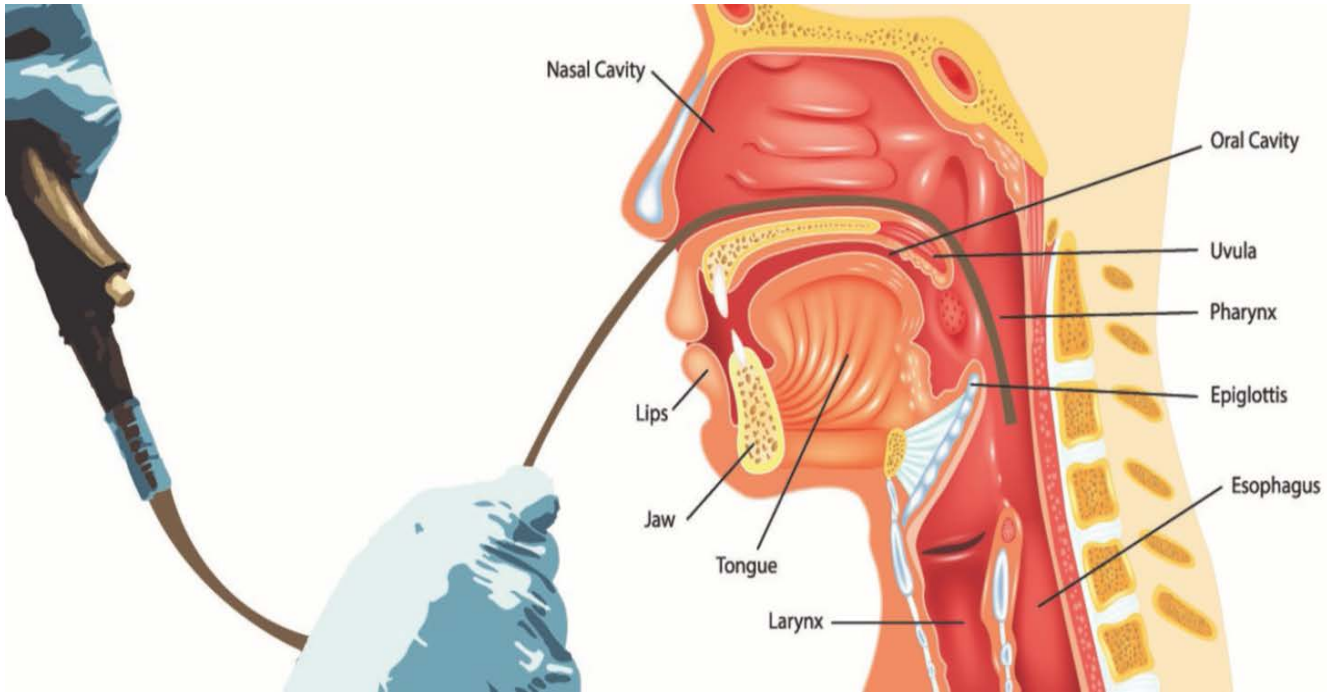
- **Fine needle aspiration is the preferred diagnostic tool for patients with a neck mass deemed at increased risk for malignancy when the diagnosis of the neck mass remains uncertain**
  - Open biopsy can lower prognosis in some cases and should be avoided unless no other source is noted and FNA is equivocal
- **For thyroid malignancies there is no place for uptake studies unless hyperthyroidism has been noted on laboratory testing. FNA is the preferred diagnostic tool**

# Further Assessment

- Delay in diagnosis can be harmful
  - An adult patient with a neck mass who experiences delayed diagnosis of a neck mass may suffer progression of disease with increased mortality and poorer functional outcome
  - Delays as short as 2 months are associated with cancer recurrence and mortality
- Among patients with HNSCC who present with neck mass, diagnostic delay is common of up to 3-6 months

# Further assessment

- Targeted exam (including the larynx, base of tongue, and pharynx), for patients with a neck mass deemed at increased risk for malignancy



# Further Assessment

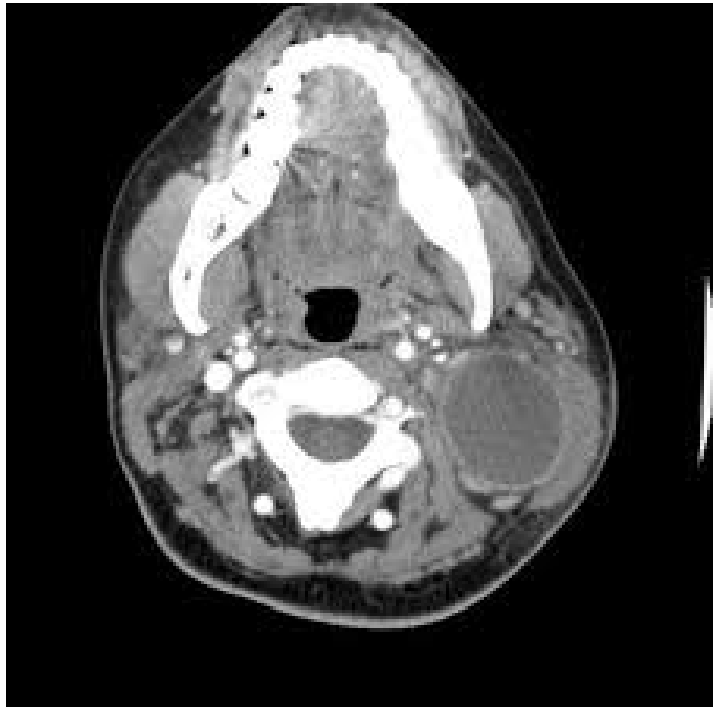
- Exam under anesthesia with open biopsy/excision if unable to determine diagnosis with FNA and high risk of malignancy

# Recap

- Most of the neck masses seen by a primary care physician are caused by inflammatory disorders that are either self-limiting or resolve following a course of antibiotics within a few weeks.
  - If the mass does not resolve within 2 weeks following an antibiotic trial
  - Rapid enlargement with or without inflammation
  - Thyroid mass
  - Salivary mass
  - Congenital or other neoplastic process is suspected
- **When a malignancy is highly suspected, immediate referral is recommended, and referral is warranted**

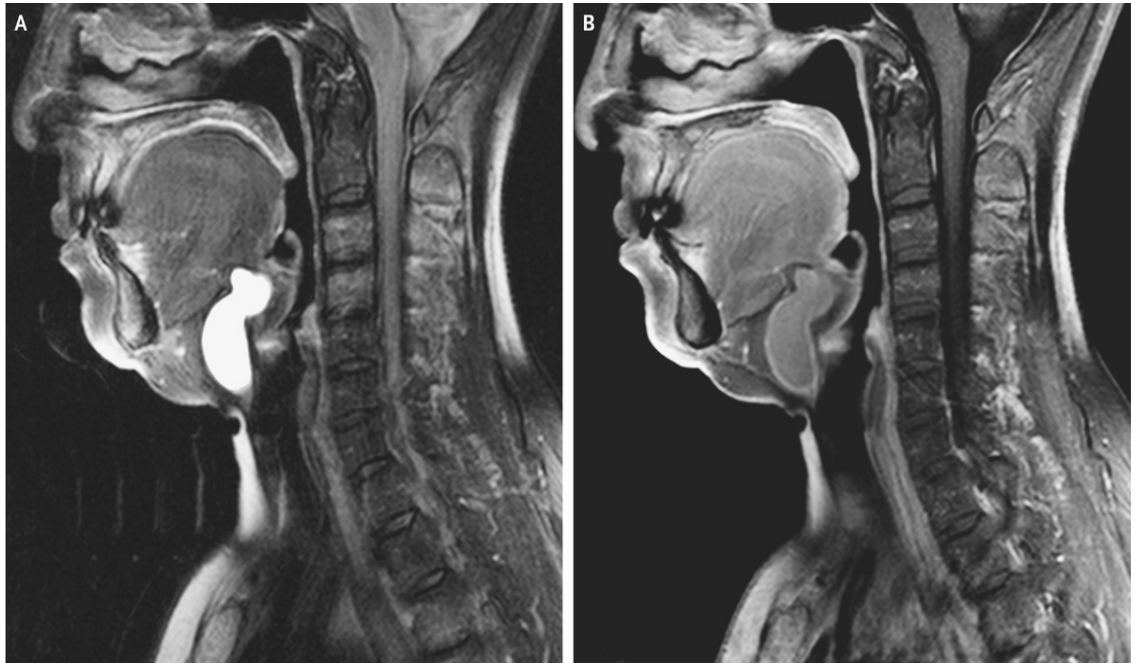
# Parotid Mass

# Branchial Cleft Cyst



# HPV Related SCC

# Thyroglossal Duct Cyst




# Thank you - Questions?

# Evaluation Questions

- True or false? Nodes approaching 2 cm in size lasting 2 weeks beyond infection resolution merit further evaluation
- True or false? A routine trial of antibiotics should be attempted for all neck masses.
- True or false? A thyroid uptake study is the preferred method of initial evaluation for thyroid malignancy?