Evaluation of the Adult Neck Mass

K. Rodney Arnold, M.D.
Family Medicine Update
June 12, 2014

Objectives

- Review the anatomy of the neck
- Understand the differential diagnoses of the neck mass
- Review imaging standards in evaluation of the neck mass
- Present diagnostic standards of the neck mass
- Will not go into medical treatment of individual neck masses

Who is this?

a. Gerald Ford
b. Clint Eastwood
c. George Lucas
d. Steven Spielberg

Does he have a Neck Mass?

a. Yes
b. No
c. Impossible to say
FIRST STEP: ANATOMY

- The value of experience is not in seeing much, but in seeing wisely
  - William Osler

What’s our main concern?

- Is it cancer?!
- What should I do?!

AN ASYMMETRIC, ASYMPTOMATIC MASS IN ADULTS IS CONSIDERED CANCER UNTIL PROVEN OTHERWISE
History tips

Age, Recent Travel, Recent illness, Animal exposure, Sexual and Social Practices

Characteristics:
- Location, painful, growth rate, recurrence
- Associated symptoms
  - voice change, epistaxis, dysphagia
  - Systemic symptoms
    - Fever, night sweats, weight loss (classic "B" signs of lymphoma)

Malignancy Red Flags

- Age >40
- Rapid growth and persistence
- History of Malignancy
- Tobacco/Smoking

Physical Examination

- Resist the temptation to go straight to the mass
- Skin examination is involved
- Inspect the OROPHARYNX
- Cranial nerve examination is involved
- Palpation
  - Location, size, character (tender, fixed, pulsatile, rubbery)

Palpation Clues

- Reactive: discrete, mobile, firm or rubbery, slightly tender
- Infected: asymmetric, tender, warm, erythematous, fluctuant
- Congenital: soft, ballotable, mobile
- Lymphoma: rapidly expanding (days-weeks)
- Vascular: pulsatile
- Thyroid/thyroglossal duct: elevates with swallowing

Worrisome Characteristics

- FIXED
- FIRM
- MATTED
- >1.5 CM

What is Pemberton’s sign?

- a. Capricorn
- b. A physical examination technique
- c. A mass that presents in the mandibular region
Mass Location Matters

- Supraclavicular
  - Lung, gynecological, GI
- Preauricular and angle of the jaw
  - Typically salivary or lymphoid in the parotid

*Posterior triangle*

What is the basis for a differential diagnosis?

**VINDICATUM**

- Vascular
- Infectious/Inflammatory
- Neoplastic
- Drugs
- Iatrogenic
- Congenital
- Autoimmune
- Trauma
- Unknown
- Metabolic

"KITTENS"

- K: Congenital
  - Thyroglossal duct/branchial cleft cyst, dermoid cyst
- Infectious/Inflammatory
  - Lymphadenitis, viral (EBV/CMV/HIV), bacterial (Bartonella, tularemia, Mycobacterium), SQ abscess
- T: Trauma
  - Hematoma, pseudoneuroma, laryngocoele
- T: Toxic
  - Thyroid toxicosis
- E: Endocrine
  - Thyroid/parathyroid neoplasms
- N: Neoplasms
  - Salivary gland, lipoma, lymphoma, SCC
- S: Systemic
  - Sarcoid, Sjogren's syndrome

Laboratory Evaluation
Intentional blood analysis

- Beginning analysis—CBC with diff—suggestive of infection or malignancy
- ESR/CRP—systemic inflammation
- EBV/CMV—diffuse adenopathy
- HIV—demographic based risk
- TSH
- Serology for T gondii, brucellosis, bartonella, tularemia
- Tuberculin skin test
- Ro/SSA and La/SSB antigens—periparotid/submandibular mass of Sjogren’s

“One of the most reprehensible surgical practices is the immediate incision or excision of the cervical mass for diagnosis without preliminary investigation...”

Imaging

- Ultrasound
- CT Contrast
- CT Angiography
- MRI

- SURGEON preference: permanent, fixed imaging in the operative setting

ACR Appropriateness NECK MASS

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Recommended Radiologic Procedure</th>
<th>Rating</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult – Nonpulsatile Solitary Neck Mass</td>
<td>CT neck with contrast</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Adult – Solitary Neck Mass</td>
<td>CT neck with contrast</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Adult – Pulsatile Neck Mass</td>
<td>CT neck with contrast / CTA neck with contrast</td>
<td>9 / 9</td>
<td>May be done at same time as CT of neck</td>
</tr>
<tr>
<td>Adult – multiple neck masses</td>
<td>CT neck with contrast</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Adult w/ history of cancer treatment + neck mass</td>
<td>CT neck with contrast / POG-PET/CT Neck</td>
<td>9 / 9</td>
<td>Either study may be used and are considered equivalent</td>
</tr>
</tbody>
</table>

MRI

- Indicated mostly with suspicion of perineural spread or potential CNS origin

Diagnostic Studies

- Fine Needle Aspiration—Histological gold standard
  - Safe and highly accurate
  - Reliably distinguish cyst from solid mass
  - Not always definitive but improved diagnostic yield
  - Cytologic analysis, PCR testing (EBV, HPV)
Distilling all of that, I now go with my HPI, PE and then ask myself...

Is this congenital, inflammatory, or neoplastic

Congenital

27 yo healthy female comes to you with a midline mass present for 2 weeks. She recently had a URI. She has no other constitutional symptoms.

On examination the mass moves with swallowing and deglutition.

All laboratory investigation is normal.
Case #1

What is this?

a. dermoid cyst  
b. branchial cleft cyst  
c. thyroglossal duct cyst

Case #2

20 y.o. Trumpet player for UTC was in an MVA a couple of weeks ago, rear-ended by another vehicle. Very low impact. Was brought to the ER and everything was “fine.” He’s been paying more attention to his health since the accident, and recently, a band member noticed something on his neck. Of note, he’s been playing his heart out on the trumpet over the past couple of years...

Case #2

Is this a...

a. Pseudoaneurysm  
b. Hematoma  
c. Laryngocele
**Infectious/Inflammatory**

- **Reactive Viral**
  - Adeno, Rhino, Enterovirus
  - EBV—occasionally >2cm, posterior triangle, regional LAD, up to 6 w

- **Bacterial**
  - Staph and Strep—suppurative
  - Tularemia, Brucellosis, TB, HIV, Bartonella (Rochalimaea)

---

**Case #3**

43 yo Latin male comes in with a painless mass superior to his collar bone. Present for 6 weeks and increasing in size.

- No reported constitutional symptoms
- No significant PMH, FH, Social Hx

PE: Left-sided slightly indurated, non-tender 5cm posterior cervical mass was present just lateral to the sternocleidomastoid muscle. The overlying skin was slightly erythematous but there was minimal tenderness. The oral cavity, face and scalp were normal. There was no enlargement of axillary or inguinal nodes and no hepatosplenomegaly.

The white blood cell (WBC) count was normal and the erythrocyte sedimentation rate (ESR) and C-reactive protein were mildly elevated. An urgent contrast-enhanced computed tomography (CT) scan of the neck and chest showed a 2.8 cm x 5.3 cm well delineated soft tissue mass with a central area of lower attenuation. No metastases are noted.

He returns for results and now it’s fluctuant.

---

You want a diagnosis so you...

- a. Do an excisional biopsy
- b. FNA biopsy
- c. Refer to an ENT to help in evaluation

**AFB Smear Positive**
Any ideas?

Neoplastic

- Is this metastatic head and neck cancer?
- Is this a thyroid mass?
- Is this a salivary gland neoplasm?
- Is this lymphoma?

**Lymphoma**

- Hodgkin’s
  - 75% Cervical
  - 5-30 yo, >55-bimodal
- Non-Hodgkin’s
  - 30-40% Cervical
  - Avg 60’s

**Initial Symptoms in Patients With HPV-Positive and HPV-Negative Oropharyngeal Cancer**

- Wesley R. McIlwain, BS; Amit J. Sood, BA; Shaun A. Nguyen, MD, MA; Terry A. Day, MD

**Objectives**

- To analyze the most common initial symptoms in patients with OPSCC and to determine if any differences in initial symptoms occur between HPV-positive and HPV-negative tumors.

**Design, Setting, and Patients**

- Retrospective single-institution review of medical records of previously untreated patients with OPSCC diagnosed from January 1, 2008, to May 20, 2013, who were evaluated by 1 physician (the senior author, T.A.D.) at the Medical University of South Carolina.

**Main Outcomes and Measures**

- We determined the most common initial symptoms of OPSCC and analyzed differences between HPV-positive and HPV-negative tumors.

**Results**

- Neck mass (in 39 patients [44%]) and sore throat (in 29 patients [33%]) comprised the most common initial symptoms in OPSCC. Patients who were HPV-positive were more likely to initially notice a neck mass than HPV-negative patients (51% vs 18%; \( P = .02 \)), whereas HPV-negative patients were more likely to notice sore throat (53% vs 28%; \( P = .09 \)), dysphagia (41% vs 10%; \( P = .05 \)), or odynophagia (24% vs 6%; \( P = .04 \)).

**Summary**

- Evaluation of a neck mass is methodical
  - Key components: age, rate of change of the mass, symptoms of pain, symptoms of systemic illness, tobacco, alcohol, sexual practices
  - CONGENITAL, INFLAMMATORY/INFECTIOUS, NEOPLASTIC
  - Laboratory should be well guided
- For the persistent mass concerning for malignancy, imaging usually begins with a contrast CT scan of the neck, but U/S eval is also acceptable
- Fine needle aspiration is useful but not always definitive

**References**
