



Case Presentations of Neck Masses: The Difficult Differential Diagnosis

The presentation of a neck mass, whether the cause is traumatic or nontraumatic, can be challenging to the emergency physician. The differential diagnosis, evaluation approach, and treatment modalities of neck masses will be discussed through the use of case presentations.

- Discuss the differential diagnosis of neck masses, both traumatic and nontraumatic.
- Describe the diagnostic evaluation of neck masses.
- Discuss the management for each presented case.

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**Consultant - Helix Medical
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FACULTY

*William J Levin, MD, FACEP

Assistant Professor, Emergency
Medicine, New York Medical
College; New York; Attending
Physician Otolaryngology/Head and
Neck Surgery, New York Eye and
Ear Infirmary and Lenox Hill
Hospital, New York, New York

INTRODUCTION

Patients with a lump in the neck may first present to the emergency physician. Usually head and neck masses are not acute emergencies, however there are cases when patients with neck masses will present with an airway emergency, massive hemorrhage or infected mass that requires emergent treatment. Therefore it is important that the emergency physician is able to identify and initiate treatment of potentially dangerous masses from those which can be evaluated and referred.

Etiology of neck masses are congenital, infectious, traumatic or neoplastic. In the pediatric population neck masses are fairly common and usually benign. The majority of neck masses in patients over forty years of age are malignant. 12% of patients with head and neck cancer the neck mass is the initial presenting symptom. 5% of patients with a primary site not in the head and neck will have a lump in the neck as the first sign of metastatic disease from a distant site. When the primary is in the head and neck region statistically 85% arise from tumors of the upper aerodigestive tract, 10% from infraclavicular tumors and 5% of cases the primary is never discovered.

ANATOMY

Lymph Nodes

- The body contains about 600 lymph nodes

- 200 of these are in the neck

- Clinically nodes are divided into 8 groups

- Each group tends to receive lymphatic drainage from discrete anatomic area

- Normal nodes are oval, mobile and usually not palpable

- Excessive lymph flow to nodes 2nd to neoplastic or infectious etiology

Neck Masses in Children

- 6 months to 12 years old immune system in dynamic phase

- Series of infections produce adenopathy in the neck

- Adenopathy can remain for many months

- Pain, tenderness and consistency of node of little prognostic significance

- “80% Rule” Children 80% of neck masses are benign 20% neoplastic (reverse for adults)

- Majority of malignant masses in children are lymphomas and sarcomas

Neck Masses in Adults

- 80% are malignant

- Enlarged neck nodes most commonly from primary in head and neck region

- Majority of head and neck tumors are squamous cell carcinoma

- Although less common than children adults can present with lymphadenopathy from infectious processes

- TB can present as an enlarged infected neck mass (Scrofula)

DEFINITION OF ABNORMAL NECK MASS

Palpable lymph node or other mass regardless of size in newborns

Palpable lymph node or other mass greater than one centimeter in children
6 months to 12 years old

Palpable lymph nodes or other masses greater than 3 millimeters in adults

DIAGNOSIS OF NECK MASSES

History

Duration

Recent change in size

Associated symptoms or illness when neck mass presented

Dysphagia

Hoarseness

Odynophagia

Referred Otalgia

Dental pain

Weakness

Night Sweats

Fever

Alcohol and heavy smoking

Cough with hemoptysis

Abdominal pain

Physical Examination

Palpation of the Neck

Complete examination of head and neck

Bimanual examination of any palpable intraoral mass

Indirect laryngoscopy

Fiberoptic endoscopy through the nasal cavity

Radiographic Studies

Plain films usually not helpful

Always get chest x-ray

CT scan delineates abnormal tissue structures greater than 1.5 cm

Contrast media is performed to distinguish enhancing lesions

Enhancing is due to uptake of media by lesion

Adenopathy due to benign disease tends to enhance strongly

Malignant nodes enhance weakly or not at all

Typically malignant nodes have “ring enhancement” at periphery of node

MRI excellent for delineation of soft tissues but unable to image bone

Sonograms useful in distinguishing cystic from solid masses

DIAGNOSIS OF NECK MASSES

Initial Laboratory Studies

- Complete blood count
- Mono spot
- PPD
- Gram stain check for acid fast bacteria
- Cultures if area is infected
- ESR

CASE PRESENTATIONS

18 year old male w/ long hx of intermittent mass in the midline of neck, now increased in size

- Vital Sign stable
- Afebrile
- 4.0 cm mass in midline
- Mass moves with protrusion of tongue
- Thyroid Scan negative
- CT scan

18 year old with neck mass

CAT scan results as shown

What is your initial diagnosis?

- Dermoid
- Plunging ranula
- Thyroid gland pathology
- Thyroglossal duct cyst

CONGENITAL LESIONS

Dermoid

- Generally midline
- Most commonly in submental location
- No connection with hyoid therefore do not move with swallowing

Branchial cleft cysts: 4 Types

Congenital remnants of brachial arches

Can present as uninfected cyst or as an erythematous swollen mass with drainage (sinus tract)

First branchial cyst presents along horizontal portion of mandible

Second present along upper ½ of sternocleidomastoid muscle

Third present as cyst or sinus of lower ½ sternocleidomastoid

Fourth very rare

Thyroglossal duct cysts

- Located in midline
- Found between foramen cecum and sternal notch
- Swallowing or protrusion of tongue causes mass to move
- Often present with acute infection
- May contain thyroid tissue

4 year old with neck mass

- 4 year old male with 2 month history of lateral neck mass not responding to antibiotics.
- Vital signs stable, afebrile
- PPD reported by parents to be Negative
- HEENT
 - 3cm red indurated mass
 - tonsils 2+ without exudates
- Biopsy sent
- CAT scan ordered
- What is your initial diagnosis?
 - Cystic hygroma
 - Branchial cleft cyst Type I
 - Branchial cleft cyst Type II
 - Branchial cleft cyst Type III
 - Cervical adenitis

4 year old with neck mass for 2 months

- Biopsy results as shown
 - Multinucleated giants cells

Diagnosis

- Atypical mycobacterium

Treatment

- Surgical debridement
- PO clarithromycin or azithromycin for 8-10 weeks

INFECTIOUS ETIOLOGY OF NECK MASSES

- CERVICAL LYMPHADENITIS
 - Frequent cause (41%)
 - B - hemolytic strep
 - Staph. Aureus
 - Mycobacteria (including atypical)
- CERVICAL LYMPHADENITIS
 - Infrequent Causes (8%)
 - Toxoplasma
 - Cat -scratch bacillus
 - Actinomycosis
- CERVICAL LYMPHADENITIS
 - Rare Causes (1%)
 - Kawasaki disease
 - Kikuchi disease
 - Castleman's disease
 - Unestablished cause (50%)

18 year old male - stab wound to lateral neck- expanding hematoma

- appears stable but anxious
- Physical Exam
 - VS stable pulse 100 bpm
 - Pulse oximetry 100%
 - No stridor
 - Lungs clear Sputum clear

18 year male old with stab wound to the lateral neck with expanding hematoma

- What is your next step?
 - 100 % Oxygen with non-rebreather mask
 - Immediate cricothyroidotomy
 - Fiberoptic evaluation and if airway stable then surgical consult
 - Fiberoptic examination of the airway with possible cricothyroidotomy

AIRWAY IS ALWAYS FIRST CONSIDERATION IN THE ED

Patients with traumatic neck injuries may require a surgical airway

- Fiberoptic examination normal
- Surgical consult
- Patient taken to operating room for exploration of neck wound

TRAUMATIC ETIOLOGY OF MASS

- Blunt versus penetrating trauma
- All wounds that violate the platysma require surgical consultation
- Zone of Injury will determine management of injury

Zone I & III

- Stable patients will require work up to assess the trauma to underlying structures
- Angiography can identify damage to the vasculature and dictate surgical approach
- Zone I may rapidly deteriorate and require emergent thoracotomy

Zone II :

- Surgical exploration of this area is usually straight forward and does not require angiography
- Angiography usually recommended for stable patients
- Expanding hematoma in this area can be identified by observation
 - Zone I: Below the cricoid
 - Zone II: Between the cricoid and mandible
 - Zone III: Above the angle of the mandible

AIRWAY IS ALWAYS FIRST CONSIDERATION IN THE ED

Patients with traumatic neck injuries may require a surgical airway

30 year old struck with a baseball bat to anterior neck

- Physical Exam
 - Respiratory rate 36-40
 - Inspiratory and expiratory stridor
 - coughing bloody sputum
 - Diffuse swelling and crepitus of neck
- 30 year old with blunt trauma
- What is your next step in the evaluation?
 - 100 % Oxygen with non-rebreather mask
 - Immediate cricothyroidotomy
 - Fiberoptic intubation
 - Fiberoptic examination of the airway with possible cricothyroidotomy
- Treatment
 - Immediate surgical airway
 - Open repair of larynx with neck exploration

30 year old female with trismus and swelling of submental area

- History of recent dental surgery
- History of increasing swelling of submental area
- Pain on swallowing and trismus
- Physical examination
 - VS stable temp 101.2
 - neck diffusely swollen “brawny edema”
 - tonsils appear normal
- What is your initial clinical impression?
 - Acute parotitis
 - Blockage of Wharton’s duct
 - Retropharyngeal abscess
 - Ludwig’s angina

INFECTIONS OF MAJOR SALIVARY GLANDS

- Parotitis
 1. 2nd to dehydration and obstruction of duct
 2. Staph most common cause
 3. Consider Mumps if bilateral and especially in children

- Submandibular gland infections (Sialadenitis)
 - Painful submandibular swelling
 - May have stone in duct which can be removed in ED
 - Usually unilateral

DEEP NECK SPACE INFECTIONS

- Result of spread from primary site in head and neck region
 - Swelling located inferior to angle of mandible
 - Trismus makes physical exam difficult
 - Bulging of lateral or posterior pharyngeal wall
 - Can extend into mediastinum and chest
 - May erode into the major vessels
 - Usually requires surgical drainage
- Patient can become septic and rapidly deteriorate**

LUDWIG'S ANGINA

Most commonly from dental origin

Swelling and erythema of submental and submandibular spaces

Can progress to rapid obstruction of upper airway from posterior and superior position of tongue

Brawny edema of submental and submandibular areas

SALIVARY GLAND LESIONS (Neoplastic)

- Parotid Gland Neoplastic Lesions
 - 80% benign
 - 20% malignant
 - May involve the facial nerve

SALIVARY GLAND LESIONS (Neoplastic)

- Submandibular Gland
 - 50% of masses are malignant
 - Acute obstruction of duct causes rapid onset of fullness with pain
 - Presents as mass along inferior border of mandible

Radiographic Studies

- Plain films usually not helpful
- Always get chest x-ray in adults

SELECTED READING

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