Evaluation and Management of the Patient with a Neck Mass

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Introduction

- Common clinical finding
- All age groups
- Very complex differential diagnosis
- Systematic approach essential
# Differential Diagnosis

## Table 1. Common Neck Masses

<table>
<thead>
<tr>
<th>Neoplastic</th>
<th>Congenital/Developmental</th>
<th>Inflammatory</th>
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<tbody>
<tr>
<td>Metastatic Unknown primary epidermoid carcinoma</td>
<td>Sebaceous cysts</td>
<td>Lymphadenopathy</td>
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<tr>
<td>Primary head and neck epidermoid carcinoma or melanoma</td>
<td>Branchial cleft cysts</td>
<td>Bacterial</td>
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<tr>
<td>Adenocarcinoma</td>
<td>Thyroglossal duct cysts</td>
<td>Viral</td>
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<tr>
<td>Thyroid</td>
<td>Lymphangioma/hemangioma</td>
<td>Granulomatous</td>
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<tr>
<td>Lymphoma</td>
<td>Dermoid cysts</td>
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<td>Salivary</td>
<td>Ectopic thyroid tissue</td>
<td>Tuberculous</td>
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<tr>
<td>Lipoma</td>
<td>Laryngocele</td>
<td>Catscratch</td>
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<tr>
<td>Angioma</td>
<td>Pharyngeal diverticulum</td>
<td>Sarcoïdosis</td>
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<td>Carotid body tumor</td>
<td>Thymic cysts</td>
<td>Fungal</td>
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<td>Rhabdomyosarcoma</td>
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<td>Staladenitis</td>
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<td>Parotid</td>
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<td>Submaxillary</td>
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<td>Congenital cysts</td>
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<td>Throtrast granulomas</td>
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Anatomical Considerations

- Prominent landmarks
- Triangles of the neck
- Carotid bulb
- Lymphatic levels
Anatomical Considerations

- Prominent landmarks
- **Triangles of the neck**
- Carotid bulb
- Lymphatic levels
Anatomical Considerations

- Prominent landmarks
- Triangles of the neck
- Carotid bulb
- Lymphatic levels
Anatomical Considerations

• Prominent landmarks
• Triangles of the neck
• Carotid bulb
• Lymphatic levels
General Considerations

• Patient age
  – Pediatric (0 – 15 years): 90% benign
  – Young adult (16 – 40 years): similar to pediatric
  – Late adult (>40 years): “rule of 80s”

• Location
  – Congenital masses: consistent in location
  – Metastatic masses: key to primary lesion
Metastasis Location according to Various Primary Lesions

- Scalp, Skin
- Oropharynx, Hypopharynx
- Nasopharynx
- Oral Cavity
- Larynx, Tongue
- Hypopharynx
- G.I., G.U., Pulmonary
Diagnostic Steps

• History
  – Developmental time course
  – Associated symptoms (dysphagia, otalgia, voice)
  – Personal habits (tobacco, alcohol)
  – Previous irradiation or surgery

• Physical Examination
  – Complete head and neck exam (visualize & palpate)
  – Emphasis on location, mobility and consistency
Empirical Antibiotics

- Inflammatory mass suspected
- Two week trial of antibiotics
- Follow-up for further investigation
Diagnostic Tests

- Fine needle aspiration biopsy (FNAB)
- Computed tomography (CT)
- Magnetic resonance imaging (MRI)
- Ultrasonography
- Radionucleotide scanning
**Fine Needle Aspiration Biopsy**

- **Standard of diagnosis**
- **Indications**
  - Any neck mass that is not an obvious abscess
  - Persistence after a 2 week course of antibiotics
- **Small gauge needle**
  - Reduces bleeding
  - Seeding of tumor – not a concern
- **No contraindications (vascular ?)**
Fine Needle Aspiration Biopsy

- Proper collection required
- Minimum of 4 separate passes
- Skilled cytopathologist essential
- On-site review best
Fine Needle Aspiration Biopsy
Computed Tomography

- Distinguish cystic from solid
- Extent of lesion
- Vascularity (with contrast)
- Detection of unknown primary (metastatic)
- Pathologic node (lucent, >1.5cm, loss of shape)
- Avoid contrast in thyroid lesions
Computed Tomography
Magnetic Resonance Imaging

- Similar information as CT
- Better for upper neck and skull base
- Vascular delineation with infusion
Magnetic Resonance Imaging
Ultrasonography

- Less important now with FNAB
- Solid versus cystic masses
- Congenital cysts from solid nodes/tumors
- Noninvasive (pediatric)
Ultrasonography
Radionucleotide Scanning

- Salivary and thyroid masses
- Location – glandular versus extra-glandular
- Functional information
- FNAB now preferred for thyroid nodules
  - Solitary nodules
  - Multinodular goiter with new increasing nodule
  - Hashimoto’s with new nodule
Radionucleotide Scanning

[Image of a radionuclide scan showing Warthin's Tumor with a hot nodule in the right parotid gland]
Nodal Mass Workup in the Adult

- Any solid asymmetric mass MUST be considered a metastatic neoplastic lesion until proven otherwise.
- Asymptomatic cervical mass – 12% of cancer
- ~ 80% of these are SCCa
Nodal Mass Workup in the Adult

- Ipsilateral otalgia with normal otoscopy – direct attention to tonsil, tongue base, supraglottis and hypopharynx
- Unilateral serous otitis – direct examination of nasopharynx
Nodal Mass Workup in the Adult

- Panendoscopy
  - FNAB positive with no primary on repeat exam
  - FNAB equivocal/negative in high risk patient

- Directed Biopsy
  - All suspicious mucosal lesions
  - Areas of concern on CT/MRI
  - None observed – nasopharynx, tonsil (ipsilateral tonsillectomy for jugulodigastric nodes), base of tongue and piriforms

- Synchronous primaries (10 to 20%)
Nodal Mass Workup in the Adult

• Unknown primary
  – University of Florida (August, 2001)
  – Detected primary in 40%
  – Without suggestive findings on CT or panendoscopy yield dropped to 20%
  – Tonsillar fossa in 80%
Nodal Mass Workup in the Adult

- Open excisional biopsy
  - Only if complete workup negative
  - Occurs in ~5% of patients
  - Be prepared for a complete neck dissection
  - Frozen section results (complete node excision)
    - Inflammatory or granulomatous – culture
    - Lymphoma or adenocarcinoma – close wound
Primary Tumors

- Thyroid mass
- Lymphoma
- Salivary tumors
- Lipoma

- Carotid body and glomus tumors
- Neurogenic tumors
Thyroid Masses

- Leading cause of anterior neck masses
- Children
  - Most common neoplastic condition
  - Male predominance
  - Higher incidence of malignancy
- Adults
  - Female predominance
  - Mostly benign
Thyroid Masses

- **Lymph node metastasis**
  - Initial symptom in 15% of papillary carcinomas
  - 40% with malignant nodules
  - Histologically (microscopic) in >90%

- **FNAB has replaced USG and radionucleotide scanning**
  - Decreases # of patients with surgery
  - Increased # of malignant tumors found at surgery
  - Doubled the # of cases followed up
  - Unsatisfactory aspirate – repeat in 1 month
Lymphoma

• More common in children and young adults
• Up to 80% of children with Hodgkin’s have a neck mass
• Signs and symptoms
  – Lateral neck mass only (discrete, rubbery, nontender)
  – Fever
  – Hepatosplenomegaly
  – Diffuse adenopathy
Lymphoma

- FNAB – first line diagnostic test
- If suggestive of lymphoma – open biopsy
- Full workup – CT scans of chest, abdomen, head and neck; bone marrow biopsy
Salivary Gland Tumors

- Enlarging mass anterior/inferior to ear or at the mandible angle is suspect
- Benign
  - Asymptomatic except for mass
- Malignant
  - Rapid growth, skin fixation, cranial nerve palsies
Salivary Gland Tumors

- **Diagnostic tests**
  - Open excisional biopsy (submandibulectomy or parotidectomy) preferred
  - FNAB
    - Shown to reduce surgery by 1/3 in some studies
    - Delineates intra-glandular lymph node, localized sialadenitis or benign lymphoepithelial cysts
    - May facilitate surgical planning and patient counseling
    - Accuracy >90% (sensitivity: ~90%; specificity: ~80%)
  - CT/MRI – deep lobe tumors, intra vs. extra-parotid

- **Be prepared for total parotidectomy with possible facial nerve sacrifice**
Salivary Gland Tumors
Carotid Body Tumor

- Rare in children
- Pulsatile, compressible mass
- Mobile medial/lateral not superior/inferior
- Clinical diagnosis, confirmed by angiogram or CT
- Treatment
  - Irradiation or close observation in the elderly
  - Surgical resection for small tumors in young patients
    - Hypotensive anesthesia
    - Preoperative measurement of catecholamines
Carotid Body Tumor
Lipoma

- Soft, ill-defined mass
- Usually >35 years of age
- Asymptomatic
- Clinical diagnosis – confirmed by excision
Lipoma
Neurogenic Tumors

- Arise from neural crest derivatives
- Include schwannoma, neurofibroma, and malignant peripheral nerve sheath tumor
- Increased incidence in NF syndromes
- Schwannoma most common in head & neck
Sporadic cases mostly
25 to 45% in neck when extracranial
Most commonly between 20 and 50 years
Usually mid-neck in poststyloid compartment
Signs and symptoms
  - Medial tonsillar displacement
  - Hoarseness (vagus nerve)
  - Horner’s syndrome (sympathetic chain)
Schwannoma
Congenital and Developmental Mass

- Epidermal and sebaceous cysts
- Branchial cleft cysts
- Thyroglossal duct cyst
- Vascular tumors
Epidermal and Sebaceous Cysts

- Most common congenital/developmental mass
- Older age groups
- Clinical diagnosis
  - Elevation and movement of overlying skin
  - Skin dimple or pore
- Excisional biopsy confirms
Epidermal and Sebaceous Cysts
Branchial Cleft Cysts

- Branchial cleft anomalies
- 2\textsuperscript{nd} cleft most common (95%) – tract medial to cnXII between internal and external carotids
- 1\textsuperscript{st} cleft less common – close association with facial nerve possible
- 3\textsuperscript{rd} and 4\textsuperscript{th} clefts rarely reported
- Present in older children or young adults often following URI
Branchial Cleft Cysts

- Most common as smooth, fluctuant mass underlying the SCM
- Skin erythema and tenderness if infected
- Treatment
  - Initial control of infection
  - Surgical excision, including tract
- May necessitate a total parotidectomy (1st cleft)
Branchial Cleft Cysts
Thyroglossal Duct Cyst

- Most common congenital neck mass (70%)
- 50% present before age 20
- Midline (75%) or near midline (25%)
- Usually just inferior to hyoid bone (65%)
- Elevates on swallowing/protrusion of tongue
- Treatment is surgical removal (Sis trunk) after resolution of any infection
Thyroglossal Duct Cyst
Vascular Tumors

- Lymphangiomas and hemangiomas
- Usually within 1st year of life
- Hemangiomas often resolve spontaneously, while lymphangiomas remain unchanged
- CT/MRI may help define extent of disease
Vascular Tumors

• Treatment
  – Lymphangioma – surgical excision for easily accessible or lesions affecting vital functions; recurrence is common
  – Hemangiomas – surgical excision reserved for those with rapid growth involving vital structures or associated thrombocytopenia that fails medical therapy (steroids, interferon)
Vascular Tumors (lymphangioma)
Vascular Tumors (hemangioma)
Inflammatory Disorders

- Lymphadenitis
- Granulomatous lymphadenitis
Lymphadenitis

- Very common, especially within 1st decade
- Tender node with signs of systemic infection
- Directed antibiotic therapy with follow-up
- FNAB indications (pediatric)
  - Actively infectious condition with no response
  - Progressively enlarging
  - Solitary and asymmetric nodal mass
  - Supraclavicular mass (60% malignancy)
  - Persistent nodal mass without active infection
Lymphadenopathy

- Equivocal or suspicious FNAB in the pediatric nodal mass requires open excisional biopsy to rule out malignant or granulomatous disease
Granulomatous lymphadenitis

- Infection develops over weeks to months
- Minimal systemic complaints or findings
- Common etiologies
  - TB, atypical TB, cat-scratch fever, actinomycosis, sarcoidosis
- Firm, relatively fixed node with injection of skin
Granulomatous lymphadenitis

• Typical *M. tuberculosis*
  - more common in adults
  - Posterior triangle nodes
  - Rarely seen in our population
  - Usually responds to anti-TB medications
  - May require excisional biopsy for further workup
Granulomatous lymphadenitis

- Atypical *M. tuberculosis*
  - Pediatric age groups
  - Anterior triangle nodes
  - Brawny skin, induration and pain
  - Usually responds to complete surgical excision or curettage
Granulomatous lymphadenitis

- Cat-scratch fever (*Bartonella*)
  - Pediatric group
  - Preauricular and submandibular nodes
  - Spontaneous resolution with or without antibiotics
Granulomatous lymphadenitis
Summary

- Extensive differential diagnosis
- Age of patient is important
- Accurate history and complete exam essential
- FNAB – invaluable diagnostic tool
- Possibility for malignancy in any age group
- Close follow-up and aggressive approach is best for favorable outcomes