Neck Mass
Neck Mass

- Common clinical finding
- All age groups
- Very complex differential diagnosis
- Systematic approach is essential
Neck Mass - Thyroid
Nodule Evaluation

Solitary thyroid nodule > 1 cm in diameter

Increased suspicion if:

• Age < 15 yr or > 45 yr
• Male sex
• Hx of radiation exposure
• Hx of diseases associated with thyroid cancer
• Nodule > 4 cm in diameter
• Suspicious US findings: central hypervascularity, irregular border, microcalcifications
Sonogram of the thyroid shows a 0.5 cm nodule with internal calcifications characteristic of a papillary carcinoma
Nodule Evaluation

Highly suspicious if:

- Rapid nodule growth
- Very firm nodule
- Fixation to adjacent structures
- Family history of thyroid cancer
- Vocal cord paralysis
- Enlarged regional lymph nodes
- Symptoms of invasion into neck structures
Nodule Evaluation

TN (palpation/imaging) > 1 - 1.5 cm

Hx and Physical Serum TSH

Low TSH

Normal/High

123I, 99Tc Scan

Dx U/S

Hot

Not

Eval/Rx For hyper

Not >50% cystic Nor posterior

>50% cyst or posterior

Other nodule >1.0-1.5 cm

No Nodule

Palp or U/S Guided FNA

U/S Guided FNA

U/S Guided FNA

Elevated TSH

Normal TSH

Eval/Rx for hypo

FNA not indicated
Fine Needle Aspiration Results

**FNA**

- **Benign**
- **Malignant**
  - Papillary
  - Medullary
  - Anaplastic
  - Lymphoma

- **Follicular neoplasm**
  - 20% cancer rate
  - Higher if
    - old age
    - male
    - large size
    - cold nodule
Investigations

• **Chest X-ray** is mandatory
• **Ultrasonography of thyroid & neck** is valuable
• **CT/MRI** in selected cases
• **Radionuclide scans** is nonspecific and non-diagnostic, may be useful in hyperfunctioning adenoma and follicular lesion
• **Intra-op. frozen section** not helpful in follicular lesions, may be useful in suspected papillary carcinoma
Neck Mass – Non-thyroid
Basic Work-up

• History
  – Duration: Skandelakis’s rule of sevens
    7 days = inflammation
    7 months = neoplasm
    7 years = congenital
  – Age
  – Sex
  – Race
  – Personal habits (tobacco, alcohol)
  – Previous irradiation or surgery
  – Associated symptoms (dysphagia, otalgia, voice)
### Differential Diagnosis

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

- Scalp, Skin
- Oropharynx, Hypopharynx
- Nasopharynx
- G-I, G-U, Pulmonary
- Oral Cavity
- Larynx, Tongue Hypopharynx
Basic Work-up

• Nasopharyngeal cancer
  - nasal obstruction
  - epistaxis
  - serous otitis media
  - advanced tumors: cranial neuropathies and posterior cervical lymphadenopathy
Basic Work-up

• Oral cavity cancer
  - pain
  - ulcers that do not heal
  - changes in the fit of dentures

• Cancers of oropharynx, hypopharynx, supraglottic larynx
  - usually diagnosed in later stages
  - persistent unilateral sore throat and otalgia
Basic Work-up

• Cancers of the nasal cavity and paranasal sinuses
  - sinusitis and unilateral nasal obstruction
  - spread to other sinuses: epistaxis, facial swelling or pain, exophthalmos, loosenning of the molars

• Early-stage laryngeal cancer
  - hoarseness
  - subglottic larynx have no early symptoms
Basic Work-up

• Physical Examination
  – Completer head and neck exam (visualize & palpate)
  – System exam (integumental, neurologic, gastrointestinal, respiratory, lymphatic, musculoskeletal, endocrine, genitourinary)
Basic Work-up

• Physical Examination
  – Location
  – Pain
  – Consistency
  – Fixation
  – Ipsilateral otalgia with normal otoscopy:
    direct attention to tonsil, tongue base, supraglottis and hypopharynx
  – Unilateral serous otitis: direct examination of nasopharynx
Perioral and Intraoral Soft Tissue Examination: Floor of the Mouth
Perioral and Intraoral Soft Tissue Examination: Oropharynx
Extraoral Examination
Perioral and Intraoral Soft Tissue Examination
Empirical Antibiotics

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

- Laboratory: CBC, U/A, HIV titers
- Diagnostic Radiology: CXR, sinus series, panoramic view, CT scan, MRI, U/S, radioisotope scan
- Fine needle aspiration biopsy (FNAB)
- Panendoscopy
- Open biopsy
Enlarged Neck Node

Open Biopsy

OOPS!!!

Metastatic Carcinoma

Loss to F/U  XRT  Refer Outside
Historical Perspectives

Dr. Hayes Martin 1944

- 218 carcinomas presenting as cervical adenopathy
- Incidence of unknown primary was 25%
- Nearly always secondary to a primary in the head and neck which could be treated
- A biopsy should be the last investigation
- A search for a primary tumour must be made
- Fine needle aspiration cytology (FNAC)
The purpose of this communication is to call to the attention of the medical profession in general not only to the needlessness but also to the possible harmfulness of excisional lymph node biopsy as the first or even as an early step in the diagnosis of cancer.

Am J Surg 1961
Untimely Lymph Node Biopsy

FNAB

Timely Lymph Node Biopsy
<table>
<thead>
<tr>
<th>Methods</th>
<th>Invasive ness</th>
<th>Type of specimen</th>
<th>Expense</th>
<th>Tumor contamination</th>
<th>Anesthetic method</th>
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</thead>
<tbody>
<tr>
<td>Excisional biopsy</td>
<td>More</td>
<td>Pathology</td>
<td>More</td>
<td>Possible</td>
<td>LA/GA</td>
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<tr>
<td>Incisional biopsy</td>
<td>Pathology</td>
<td></td>
<td></td>
<td></td>
<td>LA</td>
</tr>
<tr>
<td>Core biopsy</td>
<td>Pathology</td>
<td></td>
<td></td>
<td></td>
<td>LA</td>
</tr>
<tr>
<td>Fine needle aspiration (FNA)</td>
<td>Less</td>
<td>Cytology</td>
<td>Less</td>
<td>No report</td>
<td>none</td>
</tr>
</tbody>
</table>
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 ?)
Adenocarcinoma, Papanicolaou stain
Normal epithelial cell
Equipment
Fine Needle Aspiration Biopsy
Fine Needle Aspiration Biopsy

FNAB

Benign

Hyperplasia
TB

Malignant

Indeterminate

Repeat FNA with US-guided
? Core biopsy
? Open biopsy
FNAB

- Squamous cell carcinoma
- Undifferentiated carcinoma
- Poorly diff carcinoma
- Neuroendocrine carcinoma

  Multiple endoscopies & biopsy

  No primary found

  Treatment of neck

Melanoma

  Search for primary

  No primary found

  Treatment of neck

Lymphoma

  Open biopsy

  Diagnosis confirmed

  Work-up and treatment
FNAB

Adenocarcinoma

Upper neck

Imaging for salivary gland

Primary found

Treatment of primary and neck

No primary found

Treatment of neck

Lower neck

Thyroglobulin

Positive

Thyroidectomy & neck dissection

Negative

Metastatic Work-up

Systemic Rx
Molecular Diagnostic Tests

- Detection of Epstein-Barr virus in metastatic lymph nodes by *in-situ* hybridization
- Biomarkers: cytokeratins, thyroglobulin
- Gene expression array
In situ Hybridization with Epstein-Barr Virus–encoded Small RNA

Neck metastasis of undiff. nasopharyngeal cancer

Neck metastasis of unknown primary SCC
Roles of Imaging Studies

- To evaluate extent of disease in the neck
- To evaluate parapharyngeal areas
- To evaluate hidden areas – nasopharynx, base of tongue, retropharyngeal areas
- To evaluate opposite neck
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

small tumour in the base of tongue
Magnetic Resonance Imaging

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

primary SCC of the left base of the tongue
Ultrasonography

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

- 18F-Fluorodeoxyglucose positron emission tomography (FDG-PET)
- Area with increased glycolic rate of metabolically active cells.
- Increased in infection and inflammation as well as neoplasm.
- With negative clinical examination and imaging, PET detected primary tumours in 25% of the cases.
FDG-PET Scanning

Primary tumour at nasopharynx
FDG-PET Scanning

Primary tumour at base of tongue (single arrow)
Panendoscopy

• **Indication**
  - 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%)
Panendoscopy with biopsy

- 17% detection rate in the absence of physical or radiographic suspicion
- 52-56% detection rate if either clinical examination or imaging was suggestive
- 65% if both were suggestive

- Repeat panendoscopy is not useful
- Sites of primary tumours are tonsillar fossae and base of tongue in 82% of patients

Mendenhall et al. *Head Neck* 1998
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

- Lymphoma
- Salivary tumors
- Lipoma
- Carotid body and glomus tumors
- Neurogenic tumors
Congenital and Developmental Mass

- Epidermal and sebaceous cysts
- Branchial cleft cysts
- Thyroglossal duct cyst
- Vascular tumors
Thyroglossal Duct Cyst
Inflammatory Disorders

- Lymphadenitis
- Granulomatous lymphadenitis
Neck Abscess
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
Thank you for your attention