Assessment of the Patient with a Neck Mass

Mr Paul M Paddle, MBBS(Hons) FRACS, Laryngologist, ENT Surgeon
Introduction

- Common clinical finding
- All age groups
- Very complex differential diagnosis
- Systematic approach essential
Anatomical Considerations

- **Prominent landmarks**
  - **Bony-Cartilaginous**
    - Midline
    - Lateral
  - **Viscera**
    - Carotid Bulb
    - Ptotic Submandibular Glands
Anatomical Considerations

- Triangles of the neck
  - Posterior
  - Anterior
    - Submandibular
    - Submental
    - Carotid
    - Muscular

FIG. 11.5. Triangles of the neck.
Anatomical Considerations

- **Lymphatic Chains**

**FIG. 11.13.** Lymphatic system of the head and neck.

**FIG. 11.14.** Retropharyngeal nodes.
Anatomical Considerations

- Lymphatic levels
Differential Diagnosis

- By Aetiology
- By Age
- By Location

- Ideally – consider all 3 of the above categories.
## Differential Diagnosis

### By Aetiology

<table>
<thead>
<tr>
<th>CONGENITAL</th>
<th>ACQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infectious</strong></td>
<td><strong>Inflammatory</strong></td>
</tr>
<tr>
<td>Reactive Lymphadenopathy</td>
<td>Kawasaki’s Disease</td>
</tr>
<tr>
<td>i) Viral</td>
<td></td>
</tr>
<tr>
<td>ii) Bacterial</td>
<td></td>
</tr>
<tr>
<td>iii) Granulomatous</td>
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<tr>
<td>Lymphadenitis</td>
<td>Sarcoidosis</td>
</tr>
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<td>i) Viral</td>
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</tr>
<tr>
<td>ii) Bacterial</td>
<td></td>
</tr>
<tr>
<td>iii) Granulomatous</td>
<td></td>
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<tr>
<td>a. MTB, MOTT</td>
<td></td>
</tr>
<tr>
<td>b. Cat Scratch</td>
<td></td>
</tr>
<tr>
<td>c. Toxoplasmosis</td>
<td></td>
</tr>
<tr>
<td>d. Fungal</td>
<td></td>
</tr>
<tr>
<td>Sialadenitis</td>
<td>Rosai-Dorfman (SHML)</td>
</tr>
<tr>
<td>i) Parotid</td>
<td></td>
</tr>
<tr>
<td>ii) Submandibular</td>
<td></td>
</tr>
<tr>
<td>Branchial Cleft</td>
<td>Reactive Lymphadenopathy</td>
</tr>
<tr>
<td>Thyroglossal Duct Cyst</td>
<td>Kawasaki’s Disease</td>
</tr>
<tr>
<td>Vascular Malformations</td>
<td></td>
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<tr>
<td>Dermoid</td>
<td></td>
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<tr>
<td>Thymic Cyst</td>
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<tr>
<td>Ectopic Thyroid Tissue</td>
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<tr>
<td>Laryngocoele</td>
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<tr>
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<td></td>
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<tr>
<td>Rosai-Dorfman (SHML)</td>
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<tr>
<td>Other Connective Tissue Disease</td>
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</tbody>
</table>

### By Location

- **Sebaceous cysts**
- **Branchial Cleft**
- **Thyroglossal Duct Cyst**
- **Vascular Malformations**
- **Dermoid**
- **Thymic Cyst**
- **Ectopic Thyroid Tissue**
- **Laryngocoele**

**Conclusions**

- **Sarcoidosis**
- **Kawasaki’s Disease**
- **Benign Neoplasms**
- **Malignant Neoplasms**

- **Sialadenitis**
- **Reactive Lymphadenopathy**
- **Lymphadenitis**
Differential Diagnosis

- **Patient age**
  - **Pediatric (0 – 15 years):**
    - 90% benign
  - **Young adult (16 – 40 years):**
    - similar to pediatric
  - **Late adult (>40 years):**
    - majority neoplastic
<table>
<thead>
<tr>
<th>LOCATION</th>
<th>Midline</th>
<th>Anterior Triangle</th>
<th>Posterior Triangle</th>
</tr>
</thead>
<tbody>
<tr>
<td>LESION</td>
<td>Thyroglossal Duct Cyst</td>
<td>Lymphadenopathy / -itis</td>
<td>Vascular Malformations</td>
</tr>
<tr>
<td></td>
<td>Ectopic Cervical Thyroid</td>
<td>Branchial Cyst</td>
<td>Lymphadenopathy / -itis</td>
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<tr>
<td></td>
<td>Teratoid Cysts</td>
<td>Teratoid Cysts</td>
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<tr>
<td></td>
<td>(Epidermoid, Dermoid, Teratoid)</td>
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<tr>
<td></td>
<td>Laryngocoele</td>
<td>Branchial Fistula</td>
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<td></td>
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<td>Vascular Malformations</td>
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<td></td>
<td>Thymic Cysts</td>
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<td></td>
<td></td>
<td>Teratoma</td>
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</tr>
</tbody>
</table>

**Differential Diagnosis**

- Anatomical Location
Metastasis Location according to Various Primary Lesions

- Scalp, Skin
- Oropharynx, Hypopharynx
- Nasopharynx
- Oral Cavity
- Larynx, Tongue, Hypopharynx
- GI, GU, Pulmonary
Diagnostic Steps - History

1. History of Presenting Complaint
   i) Onset:
   ii) Growth:
      a. Slow:
      b. Fast
   iii) Progress:
      a. Fluctuate – vascular malformation
   iv) Airway
   v) GIT:
      a. dysphagia,
      b. odynophagia
   vi) Pain:
      a. Yes – infectious/inflammatory (except MTB/ MOTT)
      b. No – neoplastic
   vii) Systemic Symptoms

2. Risk Factors (for the 4 groups)
   i) Congenital:
      a. Change in size with URTI
   ii) Infectious
      a. Infection elsewhere – e.g. skin lesions, trauma
      b. Dental Status
      c. Recent Sick Contacts – e.g. Viral URTIs, Strep, TB
      d. O/S travel
      e. Animal Exposures – e.g. Cat Scratch, Toxoplasmosis, Coxiella
      f. Travel to Rural Setting
      g. Immunisation status
   iii) Inflammatory
      a. Drugs – e.g. Phenytoin, Carbamazepine
      b. FHx of Connective Tissue Disease
   iv) Neoplastic
      a. Smoking, EtOH
      b. Lumps Elsewhere
      c. B symptoms

3. Family History
Diagnostic Steps - Examination

1. **General**
2. **Neck**
   i) Mass
   ii) Cervical LNs
      - Normal - < 2cm
      - Abnormal > 2cm
   iii) Thyroid
3. **Complete ENT**
   i) Skin
   ii) Oral Cavity
   iii) Ear
      Nose
   iv) Throat
4. **Elsewhere:**
   i) LN basins
   ii) ? Hepatosplenomegaly
Empirical Antibiotics

- Inflammatory mass suspected
- Two week trial of antibiotics
  - Which One?
  - Cover Aerobes/Anaerobes*
    - E.g. Augmentin Duo, Clindamycin, Azithromycin
- Follow-up for further investigation
  - Initial: 48-72 hours
  - Intermediate Term: ensure resolution

* If Oral / Periodontal Health poor
Investigations

- **Bloods**
  1. General Inflammatory Screen: FBE, +/- CRP/ESR, +/- LFT
  2. Blood Culture if Febrile
  3. Infectious Lymphadenopathy/itis Screen
     i) EBV
     ii) CMV
     iii) Toxoplasmosis
     iv) Bartonella Henslae
     v) (Syphilis)
     vi) (HIV)
  4. ? MTB / MOTT
     i) Quantiferon Gold
     ii) Mantoux / TST
  5. ? Sarcoid
     i) Serum ACE
     ii) Serum Corrected Ca2+
Investigations

- Fine Needle Aspiration
Fine Needle Aspiration Biopsy

- Standard of diagnosis (adults at least)
- 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 ?)
- Children? *Controversial*
  - Paediatric Malignancies are difficult to Dx on FNA
  - Most common malignancy is Lymphoma: FNAC often inadequate for subtyping
  - Often requires a GA
Fine Needle Aspiration Biopsy

- Proper Collection Required
- Skilled cytopathologist essential
- On-site review best
- Equipment:
  i. 10-20 ml Syringe
  ii. 23-27-g needle
  iii. Alcohol Swabs
  iv. Gauze
  v. 2-4 glass slides
  vi. Spray Fixative or 95% EtOH
  vii. Balanced Salt Solution
  viii. Optional: flow-cytology Solution
  ix. Optional: Syringe Holder
Technique: Performance

2 techniques:

1. Aspiration Technique (FNA) – aspiration ‘pulls’ cellular tissue into bore of the needle

2. Non-aspiration/Capillary Technique (FNB) – needle without suction pushed repeatedly into mass

Reported Advantages:

i) Less tissue trauma

ii) Less blood in sample

iii) Better tactile sense

N.B. Most studies have not shown a great difference in overall diagnostic yield

Each seems advantageous in certain situations
Technique: Performance

1. **Non-Aspiration Technique (FNB)**
   
i. Cleanse skin with Alcohol wipe
   
ii. +/- LA
   
iii. Fixate mass with thumb/forefinger
   
iv. 25-27g needle; No Syringe
   
v. Once inside the mass: 10-15 short, quick, staccato-like strokes
   
vi. Remove needle & attach to 10-ml syringe
2. Aspiration Technique (FNA)

i. 23-g needle on a 10ml syringe

ii. 1ml air into syringe

iii. Pass into mass

iv. Apply 1-2ml suction pressure

v. 3-5 passes (small vibratory strokes)
   - 2-3 mm depth
   - Don’t change needle direction whilst in mass

vi. Cease Suction as soon as material is seen in the hub

vii. Remove from mass

viii. apply pressure
Technique: 3. Specimen Handling

1. **Expel Material onto slides:**
   i. Blow material onto slide using syringe
   ii. Bevelled edge slide-wards and touching slide surface
   iii. 2 slides

2. **Smear:**
   i. 2 slide surfaces against each other
   ii. ‘Smear’ along long-axis of slides

3. **Fix / Air-dry**
   i. Slide 1: Fixative spray @ 20-25 cm distance onto slide for *Papanicolaou staining*
   ii. Slide 2: Air-dry for *Modified Romanowsky technique*

4. **Rinse Needle:** *(esp if concerned may be lymphoma)*
   i. Use a balanced salt solution:
      - *E.g. Hanks’ Basic Salt solution* or *Roswell Park Memorial Institute (RPMI) medium*
   ii. Can be spun down for thin-layer-technique/flow/microbiologic studies
Specimen Handling
Complications

1. Haematoma
   - Very uncommon
   - Haemorrhage causing airway compromise extremely rare

2. Needle-Track Seeding
   - Extremely rare
   - Livraghi et al: 11,700 Abdominal FNA (20-23g), 0.017% rate of tumour seeding
   - Engzell et al: FNA of salivary gland adenomas – found tumour cells along the 22g needle-tract, BUT No increased recurrence @ 5 years follow up.
   - Largest study: 7 out of 4912 pts with papillary Carcinoma who underwent FNAB had needle tract implant (completely excised @ surgery)

3. ‘Other’ Structure Injury
   - e.g. RLN injury: reported, but extremely rare
   - Biggest ‘Risk’ is Non-diagnostic sample
Investigations

- **Imaging**
  1. CT Neck +/- Chest with Contrast
  2. MRI
  3. Ultrasonography
  4. Radio-nuclide Scans / PET

- ? Plain Film – Generally shouldn’t be considered in work-up of a neck mass
Computed Tomography

- Workhorse (adult)
- Good For:
  - Distinguish cystic from solid
  - Extent of lesion
  - Detail of mucosal disease
  - Bone involvement
- Vascularity (with contrast)
- Detection of unknown primary (metastatic)
- Pathologic node (lucent, >1.5cm, loss of shape)
- Avoid contrast in thyroid lesions
Magnetic Resonance Imaging

- Similar information as CT
- Better Soft Tissue Delineation
- No Radiation exposure
- Better for
  - upper neck
  - skull base
  - Salivary Gland
  - Tongue (where dental amalgam may obscure)
- Vascular delineation with infusion
- Nerve involvement delineation
Ultrasonography

- Solid versus cystic masses
- Congenital cysts from solid nodes/tumors
- In Combination with FNA – increased accuracy
- Children:
  - Noninvasive
  - No-radiation
  - No Contrast
  - Inexpensive
Radionucleotide Scanning

- **Expanding Field:**
  1. PET – neoplasia, infection
  2. 67-Gallium Scan (with SPECT) – lymphoma, osteomyelitis
  3. I123 - Thyroid
  4. Tc-99m – Osteomyelitis, Salivary gland
  5. MIBI - parathyroid
  6. MIBG - paraganglioma

- **Location – glandular versus extra-glandular**

- **Functional information**
  - Solitary nodules
  - Multinodular goiter with new increasing nodule
  - Hashimoto’s with new nodule
New neck mass

Pediatric (0-15 years)

Infectious symptoms?

Yes

Antibiotic trial

Resolution?

Yes

Order imaging

Cystic?

Yes

Do imaging characteristics fit with congenital origin (thyroglossal, branchial cleft, etc.)?

Yes

FNA

No

No

No

Yes

Order imaging

Vascular origin? (paraganglioma, hemangioma)

Yes

No

Older adult (>40 years)

Order imaging

Young adult (16-40 years)

Order imaging

Figure 116-2. Diagnostic schema for a new neck mass.
Neck Mass Work-up in a Child

**PEDIATRIC NECK MASSES**

- **History**
- **Physical Exam**
  - **Congenital**
    - Suspected:
      - Branchial cleft cyst
      - Cystic hygroma
      - Dermoid
    - MRI/CT
    - Consider surgical excision
  - **Acquired**
    - **Infectious/Inflammatory**
      - Go to B
    - **Suspected malignancy**
      - CBC with diff
      - Chest x-ray
      - MRI/CT
      - Oncology consult
      - Malignancy
        - Hodgkin’s disease
        - Other lymphoma
        - Rhabdomyosarcoma
        - Neuroblastoma
      - No malignancy
        - Consider other diagnosis

B
Neck Mass Work-up in a Child

1. Infectious/Inflammatory
   - Suspected: Inflammatory
     - Kawasaki's
     - Sinus histiocytosis
     - Drug-induced
     - Sarcoidosis
     - CBC/diff
     - EBV, cat-scratch, toxo titers
     - PPD
     - Treat with oral antibiotics
     - Good response: Observe or Surgical excision
     - Poor response: Needle aspiration MRI/CT
   - Suspected: Viral
     - CBC/diff
     - EBV, cat-scratch, toxo titers
     - PPD
     - Treat with oral antibiotics
     - Good response: Observe or Surgical excision
     - Poor response: Needle aspiration MRI/CT
   - Suspected: Bacteria
     - CBC/diff
     - EBV, cat-scratch, toxo titers
     - PPD
     - Treat with oral antibiotics
     - Good response: Observe or Surgical excision
     - Poor response: IV antibiotics
   - Suspected: Atypical mycobacteria
     - Go to C
Neck Mass Work-up in a Child

Suspected Atypical Mycobacteria

- PPD
  - +: Treat with anti-Tbc chemotherapy
  - -: Trial of oral antibiotics/anti-Tbc chemotherapy

- Good response
- Poor response

Surgical excision
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

- Any New Cystic mass (> 40 y.o.a.) must be considered a cystic metastatic lesion until proven otherwise:
  - Thyroid
  - SCC
  - Melanoma
Neck mass Work-up in an Adult

Surgery:
THYROGLOSSAL DUCT CYST SHOWING EVIDENCE OF OLD HAEMORRHAGE WITH A SMALL PAPILLARY CARCINOMA IDENTIFIED MEASURING 2.5MM. EXTERNAL MARGINS ARE CLEAR.

Dr. Ruth Story.

SUPPLEMENTARY REPORT - 6-3-2015
The sections of decalcified hyoid bone show no histologic abnormality.
# Thyroid Nodule Work-Up in an Adult

## So Which Nodules detected on Ultrasound Need an FNA?

<table>
<thead>
<tr>
<th>Nodule sonographic or clinical features</th>
<th>Recommended nodule threshold size for FNA</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-risk history&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Nodule WITH suspicious sonographic features&lt;sup&gt;b&lt;/sup&gt;</td>
<td>&gt;5 mm</td>
</tr>
<tr>
<td>Nodule WITHOUT suspicious sonographic features&lt;sup&gt;b&lt;/sup&gt;</td>
<td>&gt;5 mm</td>
</tr>
<tr>
<td>Abnormal cervical lymph nodes</td>
<td></td>
</tr>
<tr>
<td>Microcalcifications present in nodule</td>
<td>≥1 cm</td>
</tr>
<tr>
<td>Solid nodule</td>
<td></td>
</tr>
<tr>
<td>AND hypoechoic</td>
<td>≥1 cm</td>
</tr>
<tr>
<td>AND iso- or hyperechoic</td>
<td>≥1–1.5 cm</td>
</tr>
<tr>
<td>Mixed cystic–solid nodule</td>
<td></td>
</tr>
<tr>
<td>WITH any suspicious ultrasound features&lt;sup&gt;b&lt;/sup&gt;</td>
<td>≥1.5–2.0 cm</td>
</tr>
<tr>
<td>WITHOUT suspicious ultrasound features</td>
<td>≥2.0 cm</td>
</tr>
<tr>
<td>Spongiform nodule</td>
<td>≥2.0 cm&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Purely cystic nodule</td>
<td>FNA not indicated&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

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<sup>a</sup>High-risk history: History of thyroid cancer in one or more first degree relatives; history of external beam radiation as a child; exposure to ionizing radiation in childhood or adolescence; prior hemithyroidectomy with discovery of thyroid cancer, <sup>18</sup>FDG avidity on PET scanning; MEN2/FMTC-associated RET protooncogene mutation, calcitonin >100 pg/mL, MEN, multiple endocrine neoplasia; FMTC, familial medullary thyroid cancer.

<sup>b</sup>Suspicious features: microcalcifications; hypoechoic; increased nodular vascularity; infiltrative margins; taller than wide on transverse view.

<sup>c</sup>FNA cytology may be obtained from the abnormal lymph node in lieu of the thyroid nodule.

<sup>d</sup>Sonographic monitoring without biopsy may be an acceptable alternative (see text) (48).

<sup>e</sup>Unless indicated as therapeutic modality (see text).
### Thyroid Nodule Work-Up in an Adult

**So How do I interpret and Action the various Cytology Results from Thyroid FNA**

<table>
<thead>
<tr>
<th>RESULT</th>
<th>Frequency</th>
<th>Features</th>
<th>Interpretation / DDx</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Inadequate / Non-diagnostic</td>
<td>15%</td>
<td>• Fail to meet criteria for cytologic Adequacy:</td>
<td>• Sampling from <strong>cystic, haemorrhagic, hyper-vascular, hypo-cellular colloid nodules</strong></td>
<td>• Repeat FNAC with U/S guidance (reveals malignancy in 4% of women, 29% of Men)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ≥ 6 follicular cell groups</td>
<td>• 1-4% malignancy rate</td>
<td>• Hemithyroidectomy if continues to be Non-diagnostic – esp. if a solid nodule</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• each containing 10-15 cells</td>
<td></td>
<td>• 7% of nodules remain Non-diagnostic on FNA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Sampling from cystic, haemorrhagic, hyper-vascular, hypo-cellular colloid nodules</td>
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<td></td>
</tr>
<tr>
<td></td>
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<td>• 1-4% malignancy rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Benign</td>
<td>60-90%</td>
<td>• Syncytial groups +/- distinct <strong>micro-follicles</strong></td>
<td>o 0-3 % malignancy rate</td>
<td>1. Observe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Increased cellularity; scanty colloid</td>
<td>o Sampling from a:</td>
<td>• Observe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Uniform cells with round nuclei, inconspicuous nucleoli, and well-defined borders</td>
<td>• Macrofollicular neoplasm</td>
<td>• Observe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cytoplasmic features vary from <strong>scant</strong> to <strong>oxyphilic</strong></td>
<td>o False Negative Rate (i.e. missed malignancy): 1-6%</td>
<td>• Observe</td>
</tr>
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<td></td>
<td>• Syncytial groups +/- distinct <strong>micro-follicles</strong></td>
<td></td>
<td>• Observe</td>
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</table>

1. Observe
   - Repeat U/S in 6-18/12
   - If Stable in size: then U/S every 3-5 years
     - Stable:
       a. <50% increase in volume OR
       b. <20% increase in at least 2 dimensions (solid portion)

2. Repeat Bx – if:
   - ▲ in size (SEE ABOVE)

3. Consider Surgery – if:
   i) Symptomatic
   ii) Cosmetic Concerns
## Thyroid Nodule Work-Up in an Adult

### So How do I interpret and Action the various Cytology Results from Thyroid FNA

<table>
<thead>
<tr>
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### Thyroid Nodule Work-Up in an Adult

**So How do I interpret and Action the various Cytology Results from Thyroid FNA**

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<tr>
<td>4. Follicular Neoplasm or Suspicious of Follicular Neoplasm</td>
<td></td>
<td>o Suspicious for malignancy including papillary/medullary/other</td>
<td>15-30% Malignancy rate</td>
<td>1. Surgical Lobectomy</td>
</tr>
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<td>5. Suspicious</td>
<td></td>
<td>o Papillary/medullary/metastatic/lymphoma</td>
<td>60-75% Malignancy rate</td>
<td>1. Near-Total Thyroidectomy or surgical lobectomy</td>
</tr>
<tr>
<td>6. Malignant</td>
<td>5%</td>
<td>o Papillary Carcinoma: • Papillary formations, with complex branching and a central vascular core • Characteristic Nuclear features: <em>intra-nuclear inclusions, nuclear grooves, nuclear crowding</em> • Psammoma bodies • Multi-nucleated cells</td>
<td>• Carcinoma Rate: 95% at surgery • Sampling from a: i) Papillary Carcinoma ii) Anaplastic Carcinoma iii) Medullary Carcinoma iv) Lymphoma • False Positive Rate: &lt;5% o Arises from difficulty interpreting Cytology on B/G of Hashimoto’s Thyroiditis, Grave’s Disease, Toxic Nodules.</td>
<td>1. Surgery – Total Thyroidectomy +/- Neck Dissection (Level VI +/- Lateral)</td>
</tr>
</tbody>
</table>
Thyroid Nodule Work-up in an Adult

Overall Patient Journey

FIG. 1. Algorithm for the evaluation of patients with one or more thyroid nodules.

*If the scan does not show uniform distribution of tracer activity, ultrasound may be considered to assess for the presence of a cystic component.
What Could an ENT Surgeon Add in the Assessment of Neck Masses?

- **Diagnosis:**
  - 2nd Opinion

- **Examination:**
  - **LA:**
    - Flexible Nasendoscopy +/- Biopsy
    - Trans-Nasal Oesophagoscopy +/- Biopsy
  - **GA:**
    - Panendoscopy +/- Biopsy

- **Treatment:**
  - **(Medical):**
  - **Surgery:**
    - Incision Biopsy – e.g. **Lymphoma**
    - Excision
What Could an ENT Surgeon Add in the Assessment of Neck Masses?

- Ipsilateral otalgia with normal otoscopy – direct attention to tonsil, tongue base, supraglottis and hypopharynx
- Unilateral serous otitis – direct examination of nasopharynx
What Could an ENT Surgeon Add in the Assessment of Neck Masses?

- **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%)**
What Could an ENT Surgeon Add in the Assessment of Neck Masses?

- **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
Additional Possible Referrals

- Infectious Diseases Consultation
- Medical Oncologist
- Rheumatologist
- Endocrinologist
Thank You

Questions
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
Thyroid Masses
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
Lymphoma
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
Schwannoma

- 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 Masses

- 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
  - 2nd cleft most common (95%) – tract medial to cnXII between internal and external carotids
  - 1st cleft less common – close association with facial nerve possible
  - 3rd and 4th 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 (lymphangionioma)
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