Pediatric Neck Masses

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Pediatric neck masses

Unlike adults most are benign

1 in 10 of all pediatric neck masses after excision are malignant.

29% of biopsied benign appearing neck masses are malignant.

Objectives

1. Systematic approach
   ◦ Inflammatory, congenital, neoplastic
2. Appropriate and cost effective studies
3. Rule out malignancy
4. Diagnosis
5. Timely resolution
H&P

Neck mass

H&P

Lymph node

Abscess

Congenital
History

Age of onset
Duration of signs and symptoms
Pain
Change in size
  - Rate of change
Involvement of other organ systems
  - Recent H&N infections
  - Fatigue, weight loss, fever, night sweats
Environmental exposures
  - Cats, nondomestic animals, insects, travel, humans with TB
Prior treatment
Physical

Complete H&N exam
- Begin away from mass
- Scalp

Full body exam
- Primary inoculation site
- Adenopathy
- Skin lesions
  - Hemangiomas, café au lait spots
- Liver, spleen
Physical

Location of the mass

Palpation of the mass
- Tender
- Cystic
- Lymph node
- Enlarges with straining

Draining fistula
Diagnostic studies

Labs
Radiologic
FNA
Prenatal
Congenital

Imaging

TGDC

Dermoid

Branchial anomaly

Vascular malformation
Congenital -- midline

**Thyroglossal duct cyst**
- May present after birth with infection
- Moves superiorly with swallowing or protrusion of the tongue
- **Ultrasound** of mass and thyroid
- Excision - Sistrunk

**Dermoid**
- Present at birth
- Moves independently with skin
- Doughy
- Epidermal and dermal components
- Neck is second most common site
  - 18% on the neck
  - No imaging was necessary
- **Ultrasound**
- Simple excision
Congenital -- branchial

Branchial cleft cysts
  ◦ First
    ◦ Work types I and II¹
  ◦ Second
  ◦ Third/fourth

Studies
  ◦ CT/MRI

Treatment
  ◦ Excision

¹WORK W. NEWER CONCEPTS OF FIRST BRANCHIAL CLEFT DEFECTS. LARYNGOSCOPE 1972;82:1581-93
First branchial arch

ADAPTED FROM: BLUESTONE, SURGICAL ATLAS OF PEDIATRIC OTOLARYNGOLOGY 2002, DC DECKER
Second branchial arch

ADAPTED FROM: BLUESTONE, SURGICAL ATLAS OF PEDIATRIC OTOLARYNGOLOGY 2002, DC DECKER
Figure 2 (A) Artist rendition of excision of second BA cyst with sinus tract extending into the pharynx above the carotid bifurcation.

Second branchial arch cyst

PHOTOS COURTESY OF AIYSHA BALBOSA, D.O.
DRISCOLL CHILDREN'S HOSPITAL, CORPUS CHRISTI, TX
Third branchial arch

ADAPTED FROM: BLUESTONE, SURGICAL ATLAS OF PEDIATRIC OTOLARYNGOLOGY 2002, DC DECKER
Figure 2 Theoretical pathway of a third branchial arch fistula.

Nicoucar K et al. Otolaryngology -- Head and Neck Surgery
2010;142:21-28
Fourth branchial arch

ADAPTED FROM: BLUESTONE, SURGICAL ATLAS OF PEDIATRIC OTOLARYNGOLOGY 2002, DC DECKER
Fourth branchial arch
Congenital - Vascular

Lymphatic malformations

- Imaging
  - CT/MRI

- Staging

- Macro v microcystic
- Sclerotherapy v excision
<table>
<thead>
<tr>
<th>Stage</th>
<th>Location of Lesion</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Unilateral Infrahypoid</td>
</tr>
<tr>
<td>II</td>
<td>Unilateral Suprahypoid</td>
</tr>
<tr>
<td>III</td>
<td>Unilateral Infrahypoid and Suprahypoid</td>
</tr>
<tr>
<td>IV</td>
<td>Bilateral Infrahypoid</td>
</tr>
<tr>
<td>V</td>
<td>Bilateral Infrahypoid and Suprahypoid</td>
</tr>
</tbody>
</table>
3 year old Female

Right neck mass

Presented after diagnosed with ear infection by pediatrician

Unchanged >3 months

Asymptomatic
Branchial cyst? Lymphatic malformation?
Plan for the worst
Lymphatic malformation
Lymphatic malformation
Congenital - Vascular

Hemangiomas

- Complete resolution
  - 50% by 5 years
  - 70% by 7 years
- Propranolol
Hemangioma
Lymphadenopathy

- ???
  - Inflammatory
    - Infectious
  - Neoplastic
    - Non-infectious
Lymphadenopathy (>2 cm)

90% of children 4-8 yrs will have cervical adenopathy

Infection v Cancer?
When to biopsy?
FNA v Excisional biopsy?
Infectious

Viral (most common)
- Nonspecific (URI)
- Epstein-Barr virus
- HIV

Bacterial
- AOM, pharyngitis, odontogenic, sinusitis, cat scratch, mycobacterium
  - 245 patients, Dallas TX
  - MRSA 27%
  - MSSA 23%
  - Group A Strep 20%
  - B. henselae 2%
  - Mycobacterium <1%
Non-infectious

- Kawasaki disease
  - 19/100,000 children in US
  - Fever >5 days
  - Cervical lymphadenopathy
  - Edema/erythema palms/soles
  - B/L conjunctivitis
  - Strawberry tongue
- Kikuchi-Fujimoto disease
- Rosai-Dorfman
- Langerhans cell histiocytosis
Neoplastic

Lymphoma (most common in children)
Rhabdomyosarcoma (second most common in children)
Thyroid carcinoma (third most common), (adolescent girls)
Salivary gland (uncommon)
Neurogenic sarcoma, NPC, neuroblastoma
Lymphadenopathy – Clinical approach

Acute < 2 weeks
  ◦ Broad spectrum antibiotic – 2 week course

Subacute 2-6 weeks
  ◦ CBC
  ◦ PPD
  ◦ CXR
  ◦ EBV
  ◦ Bartonella
  ◦ ? Toxoplasma, HIV, Syphilis, LDH (lymphoma), urine VMA (neuroblastoma)
  ◦ ? Biopsy

Chronic > 6 weeks
  ◦ Biopsy
Lymphadenopathy -- Clinical approach

Biopsy
- Supraclavicular node
- 2-6 weeks, > 3 cm, no response to abx,
- 2-6 weeks with risk factors for malignancy
- > 6 weeks

FNA?
- Excisional bx is gold standard
  - 289 lymph node FNAs
  - 97% specificity, 49% sensitivity, 45% false negative rate
  - 83% of false negatives were lymphomas
Atypical mycobacterium

*M. avium-intracellulare, M. haemophilum (90%)*

Submandibular (50%), cervical (25%), preauricular (10%)

PPD + (85%)

Observation +/- abx

- 6 months (71%)
- 9 months (98%)
- 12 months (100%)\(^1\)

Surgical excision or curettage

\(^1\)ZAHARIA A. MANAGEMENT OF NONTUBERCULOUS MYCOBACTERIA-INDUCED CERVICAL LYMPHADENITIS WITH OBSERVATION ALONE. PEDIATR INFECT DIS J 2008;27:920-2
Cat scratch disease

*Bartonella Henselae*

*C. Felis* (cat fleas)

Primary inoculation lesion

Serology

Self limited, 6-12 weeks

Doxycycline, erythromycin
  - Immunocompromised patient

Surgery rarely indicated
  - Biopsy often negative