Pediatric Otolaryngology: Masses, Abscesses and More

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Pediatric Otolaryngology
Pediatric Neck Masses

- Congenital versus Acquired
  - Congenital lesions comprise the majority of masses (>50%)
  - Most acquired masses are of inflammatory origin (acute or chronic)
- Vast majority of masses are benign
- Etiology of pediatric masses are dependent on
  - Location of mass
  - Growth pattern of mass
  - Child’s age
Pediatric Masses

• History
  – Recent history of infection (URI)
  – Exposure to cats
  – Recent travel
  – Increase in size or presence of pain with meals (salivary)
  – Drug exposure (phenytoin induced lymphadenopathy)
Pediatric Neck Masses

• Physical exam (comprehensive)
  – Cervical lymphadenopathy--always check other lymph node groups (axillary, groin, and spleen)
  – Infants tend to have enlarged nodes in the posterior cervical region
  – Older children have lymphadenopathy in anterior cervical, posterior cervical, and submandibular regions
  – Any node >2 cm deserves further workup
  – Consistency of neck mass (i.e., hard or fixed)
Midline Neck Masses

• Thyroglossal Duct Cyst
• Dermoid Cyst
• Lipoma
• Hemangioma
• Fibroma
• Cervical lymphadenopathy
Thyroglossal Duct Cyst
Thyroglossal Duct Cyst

- Failure of involution of a portion of the thyroglossal duct tract
- Tract begins at foramen cecum on tongue, courses through the base of the tongue, passes either anterior or posterior to the hyoid, and continues inferiorly to the lower neck
Thyroglossal Duct
Thyroglossal Duct Cyst Hx

- Most common congenital neck anomaly in children
- Slow enlargement of a midline neck mass
- Infection of a mass with rapid enlargement
- Patients usually are euthyroid
- Occur equally in both genders
Thyroglossal Duct Cyst Hx

• 40-60% may be infected at presentation

• Age of onset:
  – 31% less than 10 years old
  – 20.4% are 11-20 years old
  – 13.5% are 21-30 years old
  – 34.6% are >31 years old
Thyroglossal Duct Cyst

Anterior Midline Neck Swelling

- Comprehensive history/physical examination
- Symptoms of hypothyroidism
- Clinically euthyroid
- Laboratory testing
- Abnormal TFTs (elevated TSH)
- Normal TFTs
- Surgery

Thyroid tissue
TGDC
Thyroglossal Duct Cyst
Physical Exam

- TGDC elevates with swallowing or tongue protrusion
- Typically are midline (may be off the midline)
- Although only 10% of ectopic thyroid tissue is found in the neck, it may represent the only thyroid tissue in 75% of patients
Thyroglossal Duct Cyst Workup

• Ultrasound or CT
• Thyroid nuclear scan
• Be sure to identify if the thyroid gland is in its typical location
• Make certain the mass in question is not ectopic thyroid gland
Surgery for Thyroglossal Duct Cyst

• Walter Sistrunk in 1920 described the standard procedure
• Sistrunk procedure involves the resection of:
  – The cystic mass
  – The associated deep tract
  – The middle third of the hyoid bone
    • Cannot resect more laterally due to CN 12 injury
  – The portion of the base of tongue deep to the foramen cecum
  – Recurrence rate 6.5% to 30%
Recurrent Thyroglossal Duct Cysts
Recurrent Thyroglossal Duct Cyst
Dermoid Cysts

- Occur from entrapped epithelium during embryogenesis or traumatic implantation
- Epithelial lined cavities filled with skin appendages such as hair, hair follicles and sebaceous glands
- Typically are seen in the midline and in submental region
- Painless unless infected
- Lesion moves with the underlying skin
- May be found at other sites in the head and neck including the orbit, nose, periauricular regions, nasopharynx, and oral cavity (T distribution)
Dermoid
Dermoid Cysts

• CT or ultrasound will show dermoids with cystic appearance and more dense center versus thyroglossal duct cysts (with low density fluid)
Dermoid
Lateral Neck Masses

• Branchial Cleft Cysts
• Benign inflammatory cervical lymphadenopathy
• Dermoid Cyst
• Lipoma
• Neurofibroma
Lateral Neck Masses

- Lymphangioma
- Hemangioma
- Vascular malformations
- Carotid body tumors
- Lymphoma
- Metastatic Cancer
  - Cystic lesions may be from tonsil or tongue base
Branchial Cleft Cyst

- May occur at any age
- Equal male to female ratio
- Presence of a fistula or draining sinus tract often simplifies the diagnosis
- Usually presents as a smooth, firm, nontender mass anywhere from the preauricular region to the supraclavicular fossa
Branchial Cleft Cysts

• First Branchial Cleft Cyst
  – Less than 10% of all branchial cleft cysts

• Second Branchial Cleft Cyst
  – Most common (90%)

• Third Branchial Cleft Cyst
  – rare

• Fourth Branchial Cleft Cyst
  – Very rare
First Branchial Cleft Cyst
First Branchial Cleft Cyst

• Rare (less than 10% of all branchial anomalies)
• Any cystic mass located near the ear lobule
• The mass or sinus is always located above the hyoid bone
• The tract courses through the parotid and has a variable relationship to the facial nerve
• If present, an internal tract may open into the external auditory canal or middle ear
First Branchial Cleft Cyst
First Branchial Cleft Cyst Classification

- Work’s (based on histology)
  - Type I contains only ectoderm and often has a pit in the external auditory canal
  - Type II contains ectoderm and mesoderm

- Belenky-Medina’s (based on anatomy)
  - Type I is a cyst or sinus in the preauricular area
    - Sinus tract runs is lateral/superior to facial nerve
    - Parallel to external auditory canal
    - No opening in the external auditory canal
First Branchial Cleft Cyst Classification

- Belenky-Medina (based on anatomy)
- Type II
  - A cyst, sinus tract or fistulous tract beginning below the angle of the mandible and running in an anterosuperior direction
  - The tract terminates at the junction of the bony and cartilaginous external auditory canal either with or without a direct communication
  - Both type I and II contain both ectoderm and mesoderm
Preauricular Cysts/Pits
Preauricular Cysts/Pits
Congenital Preauricular Sinuses and Tags

- Result of faulty resorption of the epithelium of the first and second arch hillocks
- Six hillocks (3 from first branchial arch and 3 from second branchial arch) form the auricle
- Usually present with a history of recurrent drainage (mucoid or purulent) or mass
- Typically present as a punctum anterior to the ascending rim of the helix, a short tract, and a sinus which ends as an attachment to the perichondrium of the root of the helix
Embryology of the Ear
Preauricular Sinuses and Tags

• Treatment

• Complete excision
  – for lesions with recurrent infection
  – plan surgery after infection has resolved (wait at least 6 weeks)
  – Dissection of the cyst should be as deep as the temporalis fascia
  – Dissection should be carried out along the cartilage of the helix (plan to remove the perichondrium of the helical root)
  – A margin of cartilage may need to be removed for revision surgery
Recurrent Preauricular Cysts
Branchiootootoreonal Syndrome
Melnick Fraser Syndrome

- Bilateral preauricular pits
- Bilateral second or third BCA in the neck
- Hearing loss (conductive or sensorineural)
- Renal dysplasia
- Autosomal dominant with variable penetrance
- Auricle may be normal to microtia
- Kidneys may be normal, anomalous but functional, or absent
Second Branchial Cleft Cyst
Second Branchial Cleft Cyst

• Most Common (90% of all branchial cleft anomalies)
• Occur along the anterior border of the sternocleidomastoid muscle in the mid neck
• May have a deep tract, sinus, or fistula
• The deep tract runs between the internal and external carotid arteries and superior and lateral to CN 9 and CN 12 and ends in the tonsillar fossa
Second Branchial Cleft Cyst
Second Branchial Cleft Cyst
Second Branchial Cleft Cyst

• Workup
  – High resolution CT
  – Contrast fistulography

• Treatment
  – Complete surgical excision
Second Branchial Cleft Cyst
Histology of Second Branchial Cleft Cyst
Third Branchial Cleft Cyst

- Rare
- Cystic mass/abscess along the anterior border of the SCM in mid to lower neck
- 90% occur on the left side
- Often misdiagnosed as a recurrent neck abscess or thyroid abscess/cyst
Third Branchial Cleft Cyst

- The deep tract runs near the thyroid and posterior to the internal and external carotid arteries and between CN 9 and CN 12 and ends in the apex of the pyriform sinus
Third Branchial Cleft Cyst
Third Branchial Cleft Cyst
Third Branchial Cleft Cyst

• Evaluation
  – High resolution CT
  – Barium swallow esophagography
  – Rigid laryngoscopy and esophagoscopy

• Treatment
  – Complete excision of lesion (may require hemithyroidectomy)
  – Electrocautery or laser of the sinus opening in the pyriform sinus (in very young or ill children)
Third Branchial Cleft Cyst
Third Branchial Cleft Cyst
Fourth Branchial Cleft Cyst

- Uncommon
- Over 90% occur on the left side
- Often impossible to distinguish between 3rd or 4th BCA without surgery
- Often misdiagnosed as a recurrent neck abscess or thyroid abscess/cyst
- Workup is similar to Third Branchial Cleft Cysts
- Surgery-- formal excision versus endoscopic electrocautery or laser ablation of the sinus opening in the pyriform sinus
Fourth Branchial Cleft Cyst

- Anatomic pathway of the deep tract begins at the apex of pyriform sinus, travels inferiorly in tracheoesophageal groove, posterior to thyroid gland and into the thorax.
- It then loops below aorta on left and below subclavian artery on right and ascends posterior to common carotid artery to loop over CN 12 and ends at anterior border of SCM.
Fourth Branchial Cleft Cyst
Summary

• An infected congenital cyst is not necessarily an abscess
• Ensure there is a normal functioning thyroid before excision of a thyroglossal duct cyst
• Be wary of preauricular (and postauricular) cysts/abscesses—be mindful of the facial nerve
• Bilateral preauricular pits are associated with hearing loss, renal dysplasia and bilateral 2 and 3 branchial cleft anomalies
• Recurrent thyroid abscesses/cysts may indicate a probable third or fourth branchial cleft cyst
References

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