Pediatric Head & Neck Masses
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Objectives

- Develop a systematic framework for assessment of pediatric head & neck masses.
- Review diagnostic categories of pediatric HN masses, using a case-based approach.

Imaging approach

- Age (who / when)
- Location (where)
- Composition (what)
- Syndrome? (why / how)

Imaging modalities

- US: superficial lesions
  - Doppler, biopsy
- CT: calcium, bone, vessels
  - Rapid, high spatial resolution
- MR: tissue contrast
  - Customizable sequences
  - DWI, high-resolution, FS
- XA: vascular
  - Invasive, dx / tx

Diagnostic categories

- Congenital
- Vascular
- Inflammatory
- Soft tissue masses
- Bone lesions

Disclosures

- None
**Congenital**

**Facial lesions**
- Nasal septum
  - Dermal sinus, glial heterotopia, sinicipital cephalocele
- Skin
  - Pilomatricoma, hamartoma, nevi
- Periorbital
  - Dacryocystocele
  - Inclusion cyst

**Branchial cleft anomalies**
- **Type 1:** EAC – mandible
  - BOR syndrome
- **Type 2:** SMG–ICA–SCM
  - Claw sign
- **Type 3:** posterior Δ – piriform
  - Inferior parathyroid
- **Type 4:** piriform – thyroid
  - Superior parathyroid
  - Parafollicular C-cells

**Visceral space**
- Thyroid
  - Thyroglossal duct: foramen cecum–hyoid
- Parathyroid
  - Sup: 4th pouch
  - Inferior: 3rd pouch
- Thymus
  - Ventral 3rd pouch
  - Hassall corpuscles
  - Thympoharyngeal duct: l–3R

**Vascular**

**Low-flow malformations**
- Lymphatic, venous, capillary
  - Micro vs. macrocystic
- Syndromes
  - Cutaneous & mucosal VM
  - Blue rubber bleb nevus
  - Generalized lymphatic anomaly
  - Overgrowth (KTV, etc.)
High-flow malformations
- AV malformation, fistula
- Syndromes
  - HHT (Osler-Weber-Rendu)
  - CM-AVM
  - Parkes-Weber
  - CAMS (Wyburn-Mason)
  - SAMS (Cobb)

Vascular tumors
- Hemangioma
  - Congenital vs. infantile
  - PHACES
- Borderline lesions

Inflammation
- Parotitis
- Dacryocystitis
- Thoracic duct cyst

Autoimmune
- Inflammatory pseudotumor
  - IgG4 granulomas
- Juvenile xanthogranuloma
  - Non-LCH histiocytosis
- Lymphoepithelial cysts
  - HIV

Soft Tissue
**Paraganglioma**
- SDHx
  - Mitochondrial complex II
  - SDHD > SDHC > SDHB
  - Also VHL, MEN, NF1
- Multiple lesions
  - Glomus caroticum, jugulare, vagale, tympanicum, faciale
  - 111In, 18F-DOPA PET

**Schwannoma**
- NF type 2
  - Schwannomin (22q12)
  - Vestibular schwannomas, meningiomas, ependymomas / gliomas
- Schwannomatosis
  - SMARCBs (22q12)
  - Plexiform schwannomas, not CN VIII
  - Rhabdoid tumors

**Fibrous lesions**
- Fibromatosis coli
- Benign fibrous tumors
  - TS: cutaneous fibromas, CNS hamartomas
  - Gardner: desmoid, inclusion cysts, osteomas
  - Reed syndrome: skin & uterine leiomyomas
- Solitary fibrous tumor
  - Dura, pleura, H&N
  - Hypoglycemia (IGF-2)

**Fat-containing**
- Dermoid / teratoma
- Lipoma
- Lipoblastoma
- Liposarcoma

**Airway**
- Pharyngeole
- Laryngeole
- Subglottic stenosis
- Esophageal & tracheal diverticula

**Malignant tumors**
- Sarcomas
  - Ewing, rhabdo-, leiomyo-, chondro-, fibrosarcoma
- Neuroblastic tumors
  - Ganglioneuroma, ganglioneuroblastoma, neuroblastoma
- Extranodal lymphoma
Bone

Jaw
- Congenital
  - Nasolabial, nasopalatine, median palatal
- Inflammatory
  - Paradental cyst, LCH, JIA
- Fibro-osseous
  - FD, cherubism
- Trauma
  - Simple bone cyst, CGCG
- Neoplastic
  - KCOT (Gorlin), ameloblastoma

Skull
- Dermoid/epidermoid
- Langerhans cell histiocytosis
- Intrasosseous VM
- Fibrous dysplasia
- Metabolic bone disease

Spine
- Aneurysmal bone cyst
- Giant cell tumor
- Osteoid osteoma / osteoblastoma
- Notochordal cell tumor

Conclusions
- Evaluation of the pediatric HN mass requires knowledge of age, location, and composition.
- Genetics & embryology provide a framework for understanding pediatric HN pathology.
- Multisystem findings should prompt workup for an underlying syndrome.

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