Benign Neoplasms of the Larynx

Background

While the most common benign laryngeal neoplasm is laryngeal papillomatosis or recurrent respiratory papillomatosis (RRP), there are a number of more rare neoplasms that the laryngologist should be aware of, including those of mesenchymal, neural and vascular origin. Depending on tumor size and location, laryngeal functions may be variably affected warranting treatment.

- Patel S and Merati A. "Benign Tumors of the Larynx". *Clinical laryngology* edited by Marvin P Fried and Melin Tan. New York: Thieme, (2015).

Recurrent Respiratory Papilloma

- Most common benign laryngeal tumor (4.6/100,000 children, 1.8/100,000 adults)
- Bimodal age distribution with juvenile and adult-onset forms
- Caused by HPV (human papillomavirus) with types 6 and 11 most commonly implicated
- Lesions frequently recur with unpredictable rates of growth and varying locations
- Low risk of malignant transformation (3-7%)
- Most common symptom is dysphonia due to papilloma formation on the vocal folds, though larger exophytic lesions involving the supraglottis can lead to airway obstruction, rarely requiring tracheotomy
- Although RRP has characteristic appearance on laryngoscopy (exophytic warty lesions with fibrovascular cores), biopsy is necessary to confirm diagnosis and to rule out carcinoma
- Treatment is guided by disease severity with the general aims of eliminating gross disease, improving airway and voice, reducing spread or seeding of disease.
- Since the disease is not cured by surgical excision and often requires several surgeries throughout a lifetime, the primary goal is to improve quality of life related to voice and swallowing while limiting cumulative damage to the larynx, including scar and stenosis.
- Debulking techniques are varied and include cold knife, microdebrider, and LASER (ablative and angiolytic)
- Adjuvant therapy is reserved for refractory or aggressive forms of RRP and can include intralesional cidofovir, bevacizumab (can be given systemic for fulminant disease)

- There is ongoing research regarding effects of preventative and therapeutic HPV vaccination on RRP
    - Derkay CS. Task force on recurrent respiratory papillomas. A preliminary report. Arch Otolaryngol Head Neck Surg 1995;121: 1386–1391 (PMID 7488368)
    - Cohn AM, Kos JT, Taber LH, Adam E. Recurring laryngeal papilloma. Am J Otolaryngol 1981;2: 129–132 (PMID 7196701)
    - Lie ES, Engh V, Boysen M et al. Squamous cell carcinoma of the respiratory tract following laryngeal papillomatosis. Acta Otolaryngol 1994; 114: 209– 212 (PMID 7515551)

Rhabdomyoma

- Arise from intrinsic laryngeal musculature
- >90% adult type found in head and neck, particularly in larynx and pharynx
- True vocal fold most common site of laryngeal involvement
- Treatment involves complete surgical excision
- Multicentricity may play a role in recurrence so careful inspection and surgical planning is advised
    - Johansen EC, Illum P. Rhabdomyoma of the larynx: a review of the literature with a summary of previously described cases of rhabdomyoma of the larynx and a report of a new case. J Laryngol Otol1995;109: 147–153 (PMID 7706924)

Lipoma

- 0.1 – 0.6% all benign laryngeal tumors
- Occur predominantly in older men
- Majority arise from supraglottis (especially aryepiglottic folds, epiglottis, and vestibule)
- Usually solitary and often confused with retention cysts
- When multicentric, can be associated with syndromes such as neurofibromatosis and Gardner syndrome
- For larger lesions, imaging can be considered with MRI providing better margin delineation
- Biopsy and histologic evaluation necessary to distinguish from liposarcoma, its malignant counterpart
- Treatment involves surgical excision depending on symptoms

- Durr ML, Agrawal N, Saunders JR, Ha PK. Laryngeal lipoma associated with diffuse lipomatosis: case report and literature review. Ear Nose Throat J 2010;89: 34–37 (PMID 20155698)
- Kapur TR. Recurrent lipomata of the larynx and the pharynx with late malignant change. J Laryngol Otol1968;82: 761–768 (PMID 5671217)

Neural Tumors

- A variety of neurogenic tumors of the larynx have been described
- Treatment consists of endoscopic excision, though external approaches may be necessary for larger lesions
    - Neurinomas (AKA neurilemommas, AKA schwannoma)
        - Most common laryngeal tumor of neural origin
        - Originate from Schwann cells
        - Usually solitary, encapsulated, rare malignant transformation
        - Usually arise in laryngeal vestibule, probably from branch of iSLN
        - Tend to displace, rather than engulf, nerve of origin which facilitates complete excision
    - Neurofibroma
        - Also derived from Schwann cells
        - Complete excision can be difficult for the following reasons:
            - Neurofibromas grow within nerve sheath encompassing nerve as it grows making it difficult to excise without sacrificing nerve of origin
            - Often multiple
            - Non-encapsulated
        - 12% chance of malignant transformation
        - Multifocality should raise suspicion for neurofibromatosis (NF) syndromes
    - Paraganglioma
        - Laryngeal paragangliomas (LPGs) are benign neuroendocrine tumors
        - Often slow-growing, though highly vascularized
        - Usually occur in 4^{th}-6^{th} decade of life

- Given the potential for hemorrhage due to LPG vascularity, some advocate for external over endoscopic approach to provide improved visualization and facilitate more complete excision
- Composed of “chief” and “sustenacular” cells, characteristic “Zellballen” pattern on histology
- May stain + for chromogranin, synaptophysin, and NSE

References

- Aponte GE, Vicens EA. Neurogenic tumors of the larynx. Ann Otol Rhinol Laryngol 1955;64: 319–325 (PMID 14362341)
- Rahbar R, Litrovnik BG, Vargas SO et al. The biology and management of laryngeal neurofibroma. Arch Otolaryngol Head Neck Surg 2004; 130: 1400–1406 (PMID 15611399)
- Schaeffer BT, Som PM, Biller HF, Som ML, Arnold LM. Schwannomas of the larynx: review and computed tomographic scan analysis. Head Neck Surg 1986;8: 469–472 (PMID 3721890)
- Moisa II. Neuroendocrine tumors of the larynx. Head & neck. 1991;13(6):498-508. (PMID 1665150)

Granular Cell Tumors

- Derived from Schwann cells
- More common in female and African American
- Most commonly located posterior 1/3 of true vocal fold
- Usually solitary, 15% satellite nodules
- Pink and firm in appearance
- Well-circumscribed, unencapsulated
- Stain + for S-100 and NSE (neuron-specific enolase)
- 50% of time, +pseudoepitheliomatous hyperplasia of overlying mucosa which leads to confusion with SCC
- Treatment – surgical excision is the mainstay, recurrence rate 2-20%, long-term surveillance recommended, <5% contain malignancy

References

- Sataloff RT, Ressue JC, Portell M et al. Granular cell tumors of the larynx. J Voice 2000;14: 119–134 (PMID 10764124)
- White JB, Glade R, Rossi CT, Bielamowicz S. Granular cell tumors of the larynx: diagnosis and management. J Voice 2009;23: 516–517 (PMID 18346870)

Hemangiomas

- Endothelial-cell tumor classically categorized into infantile and adult forms:
  - Infantile Hemangioma
    - Usually subglottic
    - Capillary (histology)
    - Sessile
    - Self-involuting
    - Females > males (2:1)
    - Present in 1st 6 months of life
    - Usually mirror pattern of cutaneous hemangioma
    - Should consider PHACES syndrome with segmental hemangioma (1/3)
    - Natural history:
      - Proliferative Phase
        - Progressive airway obstruction
        - Biphasic stridor, “croupy” cough
      - Involution Phase
        - May take years to complete, usually reduced symptoms by 18-24 months
    - Treatment aimed at maintain airway during proliferative phase
      - Observation recommended for less severe cases
      - Direct laryngoscopy and bronchoscopy is necessary to determine true extent of tumor
      - Medical therapy commonly used includes propranolol and judicious use of steroids
      - Surgical therapy may include open and endoscopic techniques depending on disease extent

- A variety of ablative and angiolytic lasers have been used with varying degrees of success

- **<u>Adult Hemangioma</u>**
  - Usually supraglottic
  - Cavernous (histology)
  - Pedunculated
  - Rarely involute
  - Slow to grow and treatment often conservative
  - Important to rule out extra-laryngeal involvement with MRI and sometimes angiography utilized to determine lesion extent
  - Most can be managed conservatively with observation

References

- Rahbar R, Nicollas R, Roger G et al. The biology and management of subglottic hemangioma: past, present, future. Laryngoscope 2004; 114:1880–1891 (PMID 15510009)
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