Upper Aerodigestive Tract Panel:
*Pediatric and Adult Laryngology*

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Learner Objectives

- After this presentation you should:
  - 1) Appreciate differences and similarities between care of pediatric and adult laryngology issues
  - 2) Understand evaluation of episodic stridor
  - 3) Comprehend current management of respiratory papilloma including vaccination recommendations for HPV

Panelists

Sophie Shay, MD  
Assistant Professor  
Pediatric Otol  
Children’s Hospital of Wisconsin / MCW

Joel Blumin, MD, FACS  
Professor & Chief  
Laryngology  
Froedtert & Medical College of WI
Case 1a: The Music Teacher

- 25yo elementary school music teacher with years of fluctuating hoarseness
- Avocational singer with country band and jazz wedding band and church
- Unable to perform lately, significant vocal fatigue after school days, voice loss at end of week
- Voice therapy trial locally without sig benefit - "plateaued", up to a month of voice rest too
- Otherwise healthy
- Voice sample:

Voice sample: August 8-11, 2019 | The American Club | Kohler, WI

• What is your diagnosis?
Case 1a: The Music Teacher

- What is your diagnosis?
- Bilateral nodules
- A TVC extensive varices
- Evidence of recent/ongoing hemorrhage
- Emergency?

Case 1b: The Hoarse Kiddo

- 5 YO M with dysphonia noted by teachers
  - Longstanding: “That’s just his voice.”
  - Constantly screaming and yelling.
- Med Hx: Full term, otherwise neg, No meds, no surgeries, no intubations, no allergies
- Social Hx: In daycare. Lives at home with parents and 3 older brothers.
- Exam: Unremarkable except for rough and strained voice with occ breaks and breathiness

Case 1b: Flexible Laryngoscopy

Case 1b: Management Options?

- Voice hygiene/therapy
- Allergy medications
- Reflux management
- Speech/Voice Therapy
- Surgery
  - Intralesional steroids
- Observation

Case 1b: Workup

- Flexible vs rigid laryngoscopy
- Stroboscopy
- Ultrasound/Imaging
- In office vs operating room
Case 1b: Peds Vocal Fold Nodules (VFN)

- Dysphonia in children is very common
  - 20% of school-aged children
  - VFN are seen in 17-30% of all school-aged children
- VFN are the most common diagnosis in children presenting with dysphonia
- Male: Female 2:1 ratio
- Peak age 5-10 years of age

Case 1a: The Music Teacher

- Initial treatment options?

Prospective cohort study:
- 155 adult subjects (mean age 21.4 years), with diagnosis of pediatric VFN between 3-12 years of age
- Vocal Handicap Index-10
Case 1a: The Music Teacher

- Initial treatment options?
  - Further voice therapy?
  - Who benefits?
  - Professional Demands? Amplification systems?
  - Voice rest/steroids?
  - How long and how much?
  - Botulinum - forced voice rest? (Belafsky et al 2009)
  - Steroid Injection?
    - 2013 Wang et al Laryngoscope meta anal
      - 6 papers 321 pts, good outcomes
    - Belofus treatment?
      - No evidence to support without HB symptoms
      - Cochrane Review 2012: No evidence for surgical vs nonsurgical interventions
        - “No suitable trials were identified”

Case 1a: The Music Teacher

- Indications for surgery?
  - Adults vs peds
  - Surgical approaches
    - Cold section
    - Laser treatment – clinic?
    - "debulking"
    - Steroid injection
  - Dealing with varices?
    - Laser treatment
    - KTP vs CO2

OR: Direct microlaryngoscopy with KTP laser treatment bilateral nodules, laser ablation of R TVC varices, bilateral kenalog injection

KTP Laser fiber settings: Pulsed, 3-PPS, 35 Joules, 15 ms pulse width
When do you excise vs surface treat nodules?
WHAT IS A NODULE ANYWAYS?!?
Case 1a: The Music Teacher

OR: Direct microsurgery with KTP laser treatment bilateral nodules, laser ablation of R TVC varices, bilateral Kenalog injection

• Post op instructions:
  • Voice rest, steroids, reflux meds, antibiotics, follow-up?
  • Voice rest duration?

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Case 1a: The Music Teacher

Three week follow-up:
• Voice nearly “back to normal”
• No fatigue with speaking, has not yet tried singing

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Case 1a: The Music Teacher

• Follow-up instructions?
• Performance schedule w/ teaching load?
  – Return to work/teaching
  – Return to singing?
• Recurrence risk?
  – Career change needed?
• Further clinic based interventions?

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Case 2a: The Stridulous Kiddo

- 2 mos full term M without a history of intubation presents with gradually worsening, intermittent inspiratory stridor noted by parents after feedings and with excitement/ agitation. The infant is quiet when sleeping and has no choking or stridor during feeds. The patient takes formula via bottle with level nipple.
- Mother notes significant backarching and frequent spitting up 10-30 minutes after feeding.
- No tracheal tugging, no sternal retractions, no cyanosis.
- Normal exam findings in clinic except for intermittent inspiratory stridor heard only when crying
- Differential diagnosis?

Case 2a: Workup

- Flexible laryngoscopy?
  - Common Flexible laryngoscopy findings in PVFM: post-glottic edema and erythema, rare anterior 2/3 vocal fold adduction seen during inspiration
- Imaging?

Case 2a: Management

- Acid reflux management
  - Proton Pump Inhibitor vs H2 blocker in infants
- Pediatric PVFM resolves often with acid reflux management but often spontaneously resolves as well
- Important to rule out other laryngotracheal pathology - laryngoscopy
Case 2b: The College Swimmer

- 23yo otherwise healthy female college swimmer referred by pulmonology
  - Relates episodes of sudden stridor and SOB with exertion, often end of sprints
  - 2 ER visits – basically self-resolved
  - Rx w albuterol and inhaled steroids no benefit
  - 4.0 GPA, excellent student, many clubs
  - Accompanied by relatively intense mother
  - No prior hx of asthma or sig SOB
  - Other work-up and evaluation?

Case 2b: The College Swimmer

- PFT’s:

Case 2b: The College Swimmer

- Exam – w/ provocation:

Laryngoscopy pearls?
How do you elicit, how often do you see, how can you improve yield?
Case 2b: The College Swimmer

- Paradoxical Vocal Fold Motion Disorder:
  - Emotional center connections to larynx?
  - Two adult types:
    - Younger female athlete vs older obese asthmatic females – “pink puffer vs blue bloater”
    - PVFM vs irritable larynx phenomenon (toxic exposure pts)
  - Treatment options:
    - Voice therapy – respiratory retraining
    - Botox
    - Reflux Rx?
    - Anxiety Rx? Long history of association with psych disorders
    - Tracheotomy for severe recalcitrant cases – doesn’t work?
  - Dx’s includes respiratory dystonia, Arnold Chiari, other central d/o, Pertussis (sudden onset adult laryngospasm)

Case 3: The Clinic Nurse

- 60yo female with h/o 3 prior surgeries for “vocal polyps”
  - 2 by Dr. Toohill at VA?
- Seen at H&N Cancer Screening event at FMLH with reported possible lesion on mirror exam – came for “checkup”
- Referred to Laryngology Clinic
- Denies throat pain, otalgia, SOB
- Mild vocal roughness and breathiness
  - Voice Sample

Case 3: The Clinic Nurse

- Clinic visit
  - WHOA.
Case 3: The Clinic Nurse

• RRP discussion:

• Diagnosis?
  – Why did I get this?
  – Peds vs adults
  – Pregnancy?
  – HPV Vaccine

• Airway management

• Procedure?
  – Technique
    • Microdebrider, laser?

Case 3: The Clinic Nurse

• OR: Awake oral intubation

• Debubking with microdebrider

• Airway management?
  – Jet, trach, oral/nasal intubation

• Procedure?
  – Technique
    • Microdebrider, laser?
    • Which laser?

Case 3: The Clinic Nurse

• Post-op f/u 4 weeks

• Voice stable, no hoarseness

• Clinic based KTP treatment of small residual disease
  – Role of KTP laser in treatment
  – Prevention strategies?
Case 3: The Clinic Nurse

Adjuvant therapies?
- Cidofovir?
- I3C?
- Celecoxib?
- Retinoic Acid?
- Acyclovir?
- Bevacizumab?

Case 3: The Clinic Nurse

- Systemic therapies?
  - Interferon alpha?
  - Pembrolizumab (anti PD-1)
    - Phase 2 NC Trial
    - Good antitumor effect in SCC
  - Bevacizumab (anti VEGF-A)
    - Phase I trial at Harvard (details)
    - Published in Europe
    - Available for injection
    - HHT treatment

Case 3b: HPV Vaccination Recs

- CDC Recommendations:
  - HPV vaccine routine age 11-12
  - Can start as early as 9yo
  - Prior to "sexual debut"
  - Recommended for females 13-26 and males 13-22 not previously vaccinated
  - Also recommended through age 45 for gay, bisexual, transgender, men who have sex with men, and immunocompromised persons (including those with HIV) not previously vaccinated
  - Risk linked to HPV
  - Some evidence shows that HPV vaccine can stimulate clearance of HPV in at-risk individuals
  - Three doses generally 0, 2, 6 mos

GARDASIL 9
Human Papillomavirus 9-valent Vaccine, Recombinant
Case 3b: HPV Vaccination Works!

- Australia started mandated vaccinations in 2007
- Have achieved > 70% population vaccine coverage
- Seeing massive (>90%) reductions in genital warts in this generation
- Studies show RRP is disappearing

Summary

- Do
  - Implement speech therapy early and often for treatment and improved long term vocal outcomes in nodule and PVFM patients
  - Consider intralesional steroids and conservative treatment for small volume benign lesions
  - Consider use of clinic and OR KTP laser in treatment of varices, papilloma, and nodules
  - Encourage all patients to vaccinate for HPV

Summary

- Do not:
  - Recommend prolonged courses of voice rest and steroids for patients with nodules
  - Treat pediatric patients exactly like little adult patients
  - Skip follow-up exams for your RRP for 15 years!