Welcome to the

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Case Studies:
Persistent OSA following Adenotonsillectomy

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Tommy

- 4 ½ year old boy presents with epistaxis
- Upon further exploration...
  ...also significant history of OSA symptoms
  - Snoring
  - Witnessed pauses during sleep
  - Very restless when sleeping
Past Medical History

- PMH: asthma, allergic rhinitis and sickle cell trait
- Immunizations: up to date
- Hospitalizations: for asthma
- Past Surgical History: None
- Medications: loratadine, mometasone, albuterol, fluticasone inhaler
- Allergies: apple juice (diarrhea and a facial rash), ipratropium bromide (anaphylactic reaction)
- Family History: mother unilateral congenital deafness
- Social History: lives at home with parents, kindergarten.
Physical Exam

- Ears - clear and healthy
- Nasal Exam - prominent vessels bilaterally
- Oral cavity - 3+ tonsils
- Nasal Endoscopy - 3+ adenoids
- Appropriate weight/height/BMI
- Bloodwork - CBC, PT/PTT, INR normal
Obstructive Sleep Apnea

- Sleep related breathing disorder characterized by intermittent episodes of upper airway collapse (during sleep) that disrupts normal ventilation during sleep and normal sleep patterns

- Results in
  - Increased work of breathing, intermittent hypoxemia
  - Sleep fragmentation
  - Poorer overall health status
  - Poor cognitive function/school performance
  - Behavioral problems
  - Nocturnal enuresis
  - Decreased quality of life
  - Linked to metabolic changes, growth inhibition
  - Cardiovascular sequelae
Treatment of Pediatric OSA

- Tonsillectomy and Adenoidectomy
  - First line treatment for children with OSA

- Other options
  - CPAP
  - Dental appliances

- Plan for Tommy
  - Tonsillectomy, adenoidectomy, nasal cautery
Tommy’s Postoperative Visit

- Continues with significant OSA symptoms
  - “no improvement in breathing during sleep”
  - Video shows gasping, loud snoring
  - Continues on loratidine and mometesone
    - mom questions efficacy of medications
  - No epistaxis!!!

- PE- nasal edema

- Switched to fexofenadine and fluticasone
Tommy- 3 months postop

- Persistent OSA symptoms
- Mom reports
  - Snoring, restless sleep
  - Tired every day after school
  - ‘dragging’
  - Behavior issues reported in school
Persistent OSA following Adenotonsillectomy

- 15-20% of children will have persistent OSA
  - Despite persistence, OSA symptoms improved

- OSA is often considered cured if symptom resolution is reported

- Greatly increased in children with obesity

- Polysomnography is gold standard for evaluating children with residual sleep disorder breathing
Tommy’s Postoperative Sleep Study

- Mild OSA
  - REM 12.9%
  - AHI 1.4/hr
  - REM AHI 8.6/hr
  - Nadir 85%
Although PSGs can provide objective data regarding the degree of SDB, they do not identify the location of the obstruction.
What is sleep endoscopy

- Dynamic visualization of the upper airway while the child is under anesthesia to identify areas of obstruction that may contribute to OSA
Upper Airway Obstruction and OSA

- Turbinate hypertrophy
- Nasal mass
- Septal Deviation
- Nasal Vestibule
- Nasal valve collapse
- Nasal mucosal edema
- Limited oral cavity size/opening
- Mandible position/size (Retrognathia-Micrognathia)
- Palate
- Adenoid regrowth
- Uvula
- Tongue size/position
- Lingual Tonsils
- Pharyngomalacia
- Epiglottis size, position, movement
- Laryngomalacia
- Mass
- Vocal cords
- Subglottic narrowing/malacia
Tommy’s Sleep Endoscopy

- Anterior nasal area clear
- Modest adenoid regrowth
  - removed but didn’t really don't think was contributing
- Base of tongue not hypertrophic
- Epiglottis tilts quite posteriorly, occasionally touching posterior wall
- Arytenoid cartilage prolapse, with short AE folds
- Lower airway normal
- Impression: good candidate for supraglottoplasty
Tommy’s Laryngoscopy
Brian

- 15 year old boy with Trisomy 21
- PMH - adenotonsillectomy, multiple sets of tubes, repeat adenoidectomy
- Always noisy when sleeping, increasing OSA symptoms
- Initially, daytime somnolence was thought to be the result of his medications (ADHD, OCD, ODD)
  - lamotrigine, aripiprazole, guanfacine
  - adjusted with no improvements
- Mom reports daytime somnolence interfering with school performance and struggle with breathing at night, mouth breathing, snoring, and restless sleep
Brian’s Physical Exam

- Mild hypertrophy of inferior nasal turbinates
- Left TM perforation
- Nasal endoscopy - prominent lingual tonsils
What do we do now?

- Sleep study
  - 0% REM
  - AHI of 72
Scheduled for “Sleep endoscopy”

- Complete upper airway evaluation
- Laryngoscopy/bronchoscopy
- Left myringoplasty
  - Possible Lingual tonsillectomy
  - Possible Adenoidectomy
  - Possible Turbinate reduction
Surgical Intervention

- Sleep endoscopy
  - Nose completely normal
  - No adenoid regrowth
  - Lingual tonsils prominent and completely ball-valving into the supraglottis
    - Lingual tonsillectomy
  - Normal lower airway
- Left patch myringoplasty
Follow-up

- Feels great
- Not falling asleep in school
- F/U sleep study essentially normal
  - REM- 19%
  - AHI- 2/hr
  - REM AHI- 2.1/hr
  - Nadir- 92%
Conclusion

- OSA negatively impacts on a child’s overall state of health, quality of life and wellbeing
- Tonsillectomy and adenoidectomy is an effective treatment of OSA in children
  - Approximately 15-20% will have persistence or recurrence of symptoms
  - Children with obesity and are at significantly higher risk for persistent OSA
  - Further evaluation may identify areas of obstruction that can be treated
- All children should be routinely screened for OSA symptoms
References


