Tonsillectomy Panel: Case Studies

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CASE 1
Case 1

• 4yo male presents with snoring, witnessed apneas, gasping at night, restless sleep, mouth-breathing
• PE: adenoid facies, 3+ tonsils
• After given options, parents elect for adenotonsillectomy
• After discussion of surgical risks, parents ask: "What about the risks of the anesthesia?"

Question 1

I feel comfortable discussing the risks of general anesthesia with my pediatric patients' families (routinely or upon request)

– Agree
– Disagree
Case 1

• You (the surgeon) explain that the risks of anesthesia to a healthy child undergoing an elective surgery are primarily airway-related and that he will be monitored overnight for these reasons

• Parents ask you about long-term effects of the anesthesia

Question 2

If prompted by the patient/parent, which anesthesia risks do you typically discuss?

A. Minor: Nausea/vomiting, sore throat, voice changes, coughing, atelectasis
B. Major: Cardiovascular events, airway edema or stenosis
C. Death
D. Potential neurotoxicity
E. A and B
F. A, B, and C
G. A, B, C, and D
H. None. I encourage them to discuss with anesthesia before surgery.

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Question 3

I feel like it is my responsibility as the surgeon to be able to discuss potential neurocognitive effects of general anesthetics in children.

– Agree
– Disagree

Question 4

I have read some of the research on neurotoxicity of anesthesia in children.

– Agree
– Disagree
Question 5

I am more comfortable explaining the risks of radiation for a CT scan to a patient or parent than the risks of general anesthesia.

– Agree
– Disagree
General Anesthesia in Children

• 6 million children receive a general anesthetic each year in the United States
  – >1 million children <5

• 5-6 million children have a CT scan each year in the US

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Patients</th>
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<tbody>
<tr>
<td>2005</td>
<td>4379 ( \pm 1330 )</td>
</tr>
<tr>
<td>2006</td>
<td>947 ( \pm 67 )</td>
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• Parents often fear anesthesia more than surgery

"...I was convinced that she could die because of anesthesia... The actual surgery of having the tonsils out did not worry me as much. It was... the anesthesia."

"Your little baby is being put to sleep. That was probably my biggest concern. The actual tonsillectomy and adenoidectomy I wasn’t concerned about."
General Anesthesia in Children

• What is the concern over neurotoxicity?
  – Animal studies have shown:
    • Neuronal death
    • Impaired synaptogenesis
    • Neurodegenerative changes in developing brain

• Which agents have been implicated in neurodegeneration?
  – Basically all of them
  – NMDA-receptor antagonists (ketamine, NO, methadone, chloral hydrate, trichloroethanol, ethanol)
  – GABA-receptor agonists (volatile gases, BZDs, barbiturates, etomidate, propofol, NO, chloral hydrate, trichloroethanol, ethanol)
General Anesthesia in Children

• When are children most susceptible?
  – Peak synaptogenesis in human infants varies in different regions of brain
    • Prefrontal cortex is last region to peak (2-3y)
      – Key in executive function and integrative and modulatory brain function
    – Vulnerability period for anesthetic-related neurotoxicity might be up to 36 months

• So what should we tell our patients?
  – Parents should be made aware of potential risks to developing brain
    • Limited conclusive evidence in humans
    • Highlight differences between animal and human studies
  – Discuss risks and benefits of waiting to perform surgery later
  – Shared Decision Making

More Information at:

Smart Tots
CASE 2

Case 2

• 7yo F presents with loud nightly snoring, witnessed apneas, choking, and gasping (parents have a video), morning and daytime sleepiness, and difficulty focusing in school
• PMH: FT, no serious illnesses
• FH: 2 older siblings had adenotonsillectomy without incident, no bleeding history

Case 2

• PE
  – Hyponasal voice, moderately obese (BMI 22), mouth-breathing, no respiratory distress
  – Non-obstructive turbinates and septum
  – 3+ tonsils, Mallampati class II
  – No neck masses
Question 1

- Next step?
  - Medical therapy (e.g. fluticasone, montelukast)
  - Sleep study
  - Surgery (adenotonsillectomy)

Case 2

- Sleep study obtained:
  - Sleep efficiency 93% (27% REM sleep)
  - AHI 47, obstructive AHI 32
  - Oxygen saturation nadir 93%
  - Average ETCO2 47 (Max 53)
  - PLMI 0
usually stage one is reduced with sleep apnea. Not really a big deal, but some would put the % stage in there.

Sulman, Cecille, 7/18/2016
Question 2

If scheduling adenotonsillectomy on this patient, I would arrange for:

- Outpatient surgery with 3-4 hour observation
- Inpatient admission to a pediatric ward
- Inpatient admission to a pediatric intensive care unit

Question 3

When deciding on outpatient vs inpatient tonsillectomy, I consider:

A. Proximity of patient to operating facility
B. Presence/number of siblings at home
C. Parent engagement during clinic visit
D. Parent level of education
E. Some of the above
F. All of the above
Postoperative Monitoring after Tonsillectomy

- **AAOHNNS Clinical Practice Guidelines, 2011**
  - Admit children with OSA documented in results of PSG for inpatient, overnight monitoring, if they are under age 3, or have severe OSA (AHI of 10 or more, SaO2 nadir less than 80%, or both)
  - No consensus on PICU admission in literature
    - Very severe OSA
    - Comorbidities
    - Significant airway/respiratory difficulty in initial postoperative period

- **European Clinical Practice Guidelines**
  - Ambulatory
    - Greater than 3 years of age
    - ASA Class I or II
    - No comorbidity to exacerbate respiratory risk
    - No hemostasis abnormality
  - Inpatient
    - Perioperative respiratory risk
    - Hemostasis abnormality
    - Respiratory difficulty on induction or awakening


SC2  Should this be > 3 years of age?
Sulman, Cecille, 7/18/2016
Postoperative Monitoring after Tonsillectomy

- Current practice patterns
  - Survey of Pediatric Otolaryngology Divisions
    - 44% have no official admission policy for children with SDB
    - 90% have minimum observation time for outpatient surgery
    - 60% changed their practices after the AAOHNS CPG in 2011


CASE 3

• 10 month old M ex-33wk admitted for FTT
• Significant noisy breathing, snoring, and struggling at night noted during admission
• PMH: no history of intubation or respiratory support at home
• PSH: history of frenulotomy at DOL 40
• PE: stertor, subcostal retractions, 1+ tonsils
• Overnight Pulse-ox: Minimum SpO2 64%
Question 1

• What is your next step?
  A. Awake flexible fiberoptic laryngoscopy
  B. Drug-induced sleep endoscopy (DISE)
  C. Sleep study
  D. Adenoidectomy
  E. Adenotonsillectomy

Case 3

• Sleep study obtained:
  – “Constantly strained breathing”
  – AH1 95
  – Minimum SpO2 60%
  • 19% of study <90%
Question 2

- Next step:
  A. Prone sleep study
  B. Adenoidectomy
  C. Adenotonsillectomy
  D. DISE +/- adenoidectomy +/- tonsillectomy
  E. Tracheostomy

Case 3

- Sleep endoscopy:
  - Complete nasopharyngeal obstruction from adenoids
  - Significant oropharyngeal obstruction but small tonsils
- Adenoidectomy alone performed
- Remained intubated <24 hours
Case 3

- O2 saturations remained >90% awake and asleep and patient discharged on POD3
- Post-op sleep study (3 months after adenoidectomy)
  - AHI 0.3
  - Minimum SpO2 87%

THANK YOU