

**Sleep Apnea & Orthodontic Care:  
A Pediatric Perspective**

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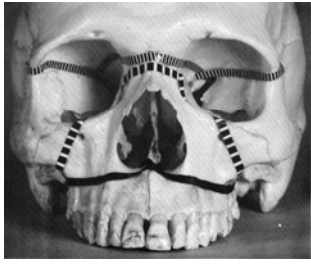
**OSA & Snoring in Kids**

- Common, Differences from Adult OSA
- Spectrum of severity
  - UARS: upper airway resistance syndrome
    - Breathing-related micro-arousals
  - Chronic snoring, 3-12%
    - Nasal vs pharyngeal (tongue base)
  - Frank OSA “syndrome”, 1-3%
    - Gas exchange abnormalities
    - ~50% of apneic events assoc with EEG arousal

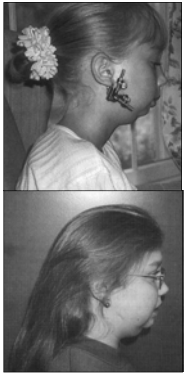
**Risk Factors for OSA**

- Enlarged tonsils +/- adenoids, +/- turbinates
- Other medical: Obesity, GERD, Seizures
- Muscle tone / strength abnormalities
  - Static: Hypo or Hypertonic
  - Progressive: Myopathies, Duchenne
- Craniofacial: A-P and Lateral dimensions
  - Mid-facial hypoplasia
  - Mandibular retrusion / micrognathia
  - High-arched palate, narrow mid-face

**Maxillary Advancement**



**Mandibular Advancement**



**Consequences**

- Cardio-respiratory:
  - Low O<sub>2</sub>, high CO<sub>2</sub>
  - Airflow limitation
- Neurobehavioral: Due to sleep fragmentation
  - Fatigue vs hyperactivity / ADD or ADHD-like
  - Morning headache
  - Moodiness / Irritability
  - Impaired Learning / Memory / Motor / Language
- Growth / Failure to Thrive
- Facial / Anatomic: “adenoid facies”

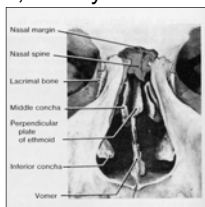
### Clinical Evaluation

- History of clinical signs & symptoms
- Exam: Facies, Oropharynx, Habitus
- Rarely: Imaging, Lab work (ABG), EKG
- Nasendoscopy: site of obstruction
- Gold Standard: Laboratory Sleep Study
  - “Polysomnogram” (PSG): scoring criteria
  - Poor correlation: screening Qs & PSGs
- Home studies
- Autonomic Tools (PAT, PTT)



### Treatment of OSA

- T &/or A, Turbinate reduction, Septoplasty
- Nasal Steroid, Allergen Elimination
- Treat GERD: sinusitis, airway edema
- (Weight Loss)
- CPAP / Bilevel PAP



### Treatment of OSA

- Orthognathic surgery
- Tracheostomy (ultimate tx; rare!)
- Oral Appliances
  - (Adults, Older adolescents)
- Newer: Orthodontic—more research needed, mild OSA
  - Rapid Maxillary Expansion

### Rapid Maxillary Expansion

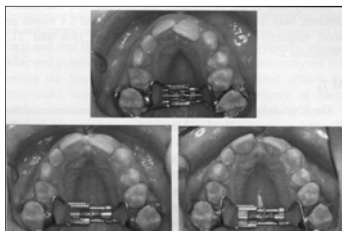
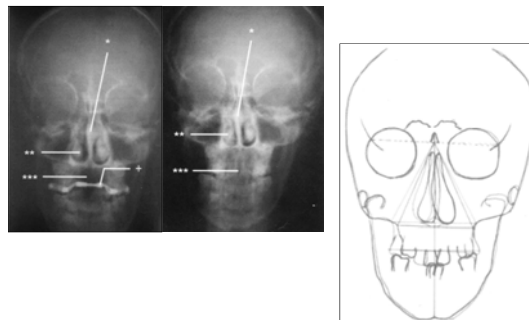


Figure 2—Occlusal sequence of treatment with rapid maxillary expansion, from crowding in the upper central incisors (upper left) to a wide space (lower image). Note how the palatal vault has changed.

### Rapid Maxillary Expansion



### Perioperative and Sedative Complications

- Age < 3 years
- Severe OSA on PSG (e.g. growth issues)
- Morbid Obesity
- Cardiopulmonary effects of OSA
  - HTN, pulmonary HTN, RVH, cor pulmonale
- Craniofacial dx
- Neuromuscular dx
- Ex-premies, more vulnerable

Thank You for my family's smiles!

