



Dysphagia Patterns in Special Populations

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1. Laryngomalacia
2. Vocal fold paralysis
3. Type I laryngeal cleft



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Laryngomalacia and Feeding

- ▶ Oral breast/bottle feeding is a highly complex sensorimotor skill involving **rapid** and **precise** coordination of **respiration** and multiple **muscles of the mouth, pharynx, larynx, and esophagus**
- ▶ Laryngomalacia is an airway obstruction resulting from collapse of the supraglottic airways and characterized by high pitched breathing sounds on inhalation



Laryngomalacia and Feeding

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- ▶ Laryngomalacia is an airway obstruction resulting from collapse of the supraglottic airways and characterized by high pitched breathing sounds on inhalation
- ▶ Oral feeding + Laryngomalacia = disruption in coordination between swallow and respiration



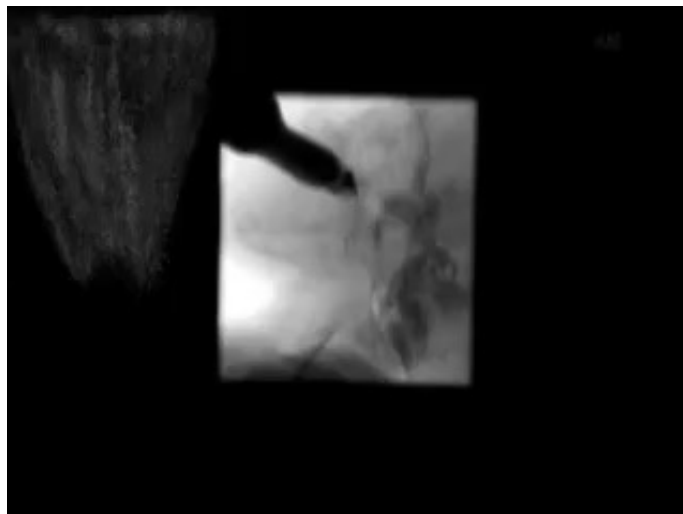
Normal Infant Feeding



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Modified Barium Swallow Study

▶ Normal MBSS



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Infant Feeding with Laryngomalacia



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Laryngomalacia

- ▶ Systematic review: Prevalence of swallowing dysfunction in children with laryngomalacia (Jaffal, H. et al., 2020)
 - ▶ Thottam et al.
 - ▶ Infants <1 year of age, mean age 8.8 weeks
 - ▶ n=72, 43 (60%) mild LM & 29 (40%) moderate LM
 - ▶ Patients with moderate LM were more likely to have penetration or aspiration on FEES
 - ▶ Irace et al.
 - ▶ Median age 7.9 months (3.2-20.5)
 - ▶ Silent aspiration occurred in 59/60 patients with aspiration on MBSS



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Laryngomalacia

- ▶ Cooper et al.
 - ▶ Mean age 14.5 months
 - ▶ 32/88 patients had instrumental assessment
 - ▶ Aspiration in 21, penetration in 8
 - ▶ Overall prevalence of swallow dysfunction in 90% of patients
- ▶ Simons et al.
 - ▶ Median age 3 months (0-115)
 - ▶ No significant differences in objective swallow assessments based on severity of laryngomalacia



Pre v Post Supraglottoplasty

- ▶ Systematic review with meta-analysis: Prevalence of swallowing dysfunction in children with laryngomalacia pre and post supraglottoplasty (Rossoni, E. et al., 2024)
 - ▶ 6 studies included for qualitative analysis
 - ▶ 5 studies included for quantitative analysis
 - ▶ 330 patients in total, 311 that underwent supraglottoplasty at an average age of 4 months
 - ▶ Objective swallowing assessment: MBSS, clinical evaluation, videoendoscopy
 - ▶ 196 cases of pre SGP dysphagia, 62 cases of post SGP dysphagia
 - ▶ Across studies, dysphagia was present in 72% of patients prior to SGP
 - ▶ 23% of patients diagnosed with dysphagia post SGP



Acid suppression v thickening feeds

- ▶ **Duncan, D. et al. (2021)**
 - ▶ Retrospective study of acid suppression v thickening feeds on laryngomalacia outcomes
 1. Risk of supraglottoplasty
 2. Time to supraglottoplasty
 3. Hospitalization risk
 - ▶ 236 patients diagnosed with laryngomalacia between January and December 2017 (22% with moderate to severe)
 - ▶ 55% treated with acid suppression
 - ▶ 36% had MBSS, 40% with aspiration and 71% was silent aspiration
 - ▶ 4 subjects with pre v post SGP MBSS, all with improvement
 - ▶ 81% of children with a reassuring clinical exam had abnormal MBSS ($p < .001$)



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Acid suppression v thickening feeds

- ▶ **Hospitalization risk**
 - ▶ Children on acid suppression v thickened feeds were twice as likely to be hospitalized for respiratory symptoms
 - ▶ Children treated with thickened feeds had significantly fewer hospitalizations for respiratory symptoms
- ▶ **Supraglottoplasty risk**
 - ▶ Required in 17% of children at 6.2 +/- 0.84 months of age
 - ▶ 40% of children with moderate to severe LM
 - ▶ 24% of children on acid suppression v 8% not on acid suppression
 - ▶ More likely to be hospitalized
 - ▶ Acid suppression use was associated with an increased odds of requiring supraglottoplasty
 - ▶ Abnormal swallow assessment was not associated with supraglottoplasty



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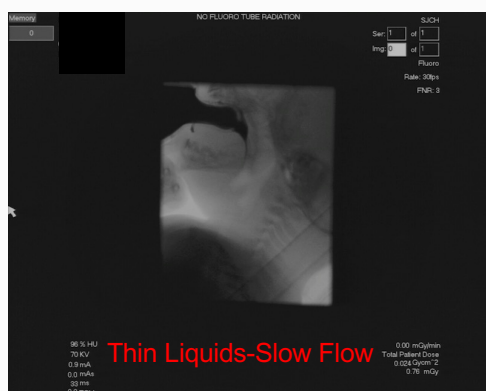
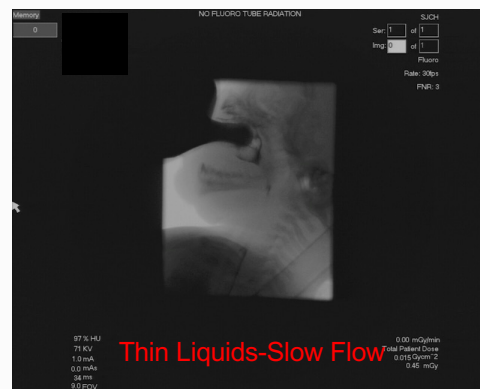
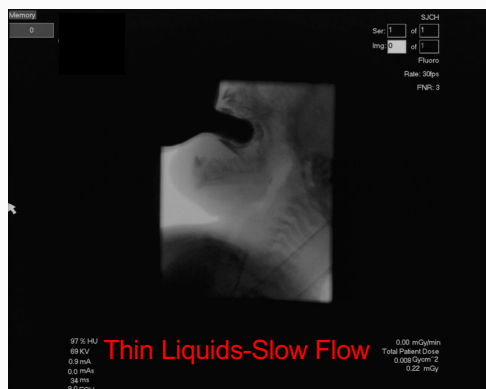
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Acid suppression v thickening feeds

- ▶ Time to supraglottoplasty
 - ▶ Significantly shorter for children on acid suppression (5.64 ± 0.92 v 7.98 ± 1.92 months)
 - ▶ Longer for children on thickened feeds (9.3 ± 1.7 v 4.56 ± 0.73 months)
 - ▶ Adjustment for disease severity and comorbidities did not change outcome



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Takeaways

- ▶ Aspiration may be missed in a large majority of children if MBSS is reserved for only those children exhibiting symptoms such as coughing with feeds
- ▶ Prevalence of "silent aspiration"
- ▶ Children with more severe laryngomalacia are more likely to aspirate on MBSS
- ▶ Supraglottoplasty may improve dysphagia in children with dysphagia and laryngomalacia
- ▶ Acid suppression does not reduce risk for hospitalization or supraglottoplasty
- ▶ Thickening may be a more beneficial alternative for reducing hospitalization and prolonging time to surgery



Vocal Fold Paralysis

- ▶ Irace, A. et al. (2018)
 - ▶ Retrospective study of children at a single institution with VF paralysis and MBSS
 - ▶ 26/28 patients had dysphagia based on MBSS
 - ▶ 15 had dysphagia with silent aspiration
- ▶ Monaghan N. et al. (in press)
 - ▶ Retrospective study of the effects of body position, upright v sidelying, on laryngeal penetration and aspiration in children with unilateral VF paralysis
 - ▶ 90 patients at single institution, 23 had MBSS in both upright and sidelying position
 - ▶ There was no difference in penetration or aspiration in the upright v sidelying position



Dysphagia Outcomes with Surgical Management

- ▶ Systematic Review: Dysphagia outcomes following surgical management of unilateral vocal fold immobility in children (Marvin, K. et al., 2023)
 - ▶ The most common surgical intervention was injection laryngoplasty
 - ▶ 9 studies included in quantitative analysis
 - ▶ Surgical intervention had a 79% success rate at improving dysphagia, 76% when stratified by patients who had IL
 - ▶ 9 studies included in qualitative analysis
 - ▶ Improvement rates from 33%-100% dependent on definition of improvement



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Takeaways

- ▶ Children with VF paralysis have high rates of dysphagia
- ▶ Aspiration is most often silent or without overt signs/symptoms such as coughing, sputtering with feeds
- ▶ Subjective assessment alone, or clinical feeding evaluation, is not sufficient to determine airway protection during feeding
- ▶ Objective swallow assessment is recommended upon diagnosis and after surgical correction



Type I Laryngeal Cleft

- ▶ Systematic Review and meta-analysis: Presentation and management of type I laryngeal clefts (Reddy, P. et al., 2020)
 - ▶ 16/24 studies included reported aspiration as the most commonly observed symptom in 80.1% of patients, followed by dysphagia in 61.1% of patients
 - ▶ Of the studies reporting pre-injection MBSS or FEES results (n=255), 90.9% of patients had penetration or aspiration
 - ▶ 61.6% had aspiration or penetration after injection (n=266)
 - ▶ Out of 94 patients across 6 studies, 72.6% had penetration or aspiration prior to endoscopic repair
 - ▶ Following endoscopic repair, 27.8% of 78 patients had penetration or aspiration



Takeaways

- ▶ The most commonly reported symptom of patients with type I laryngeal cleft is aspiration
- ▶ While injection laryngoplasty may result in resolution of dysphagia symptoms, some patients will have a reoccurrence of symptoms with need for reinjection or formal repair
- ▶ Need for standardized assessment of swallowing physiology in pediatrics
- ▶ More studies needed to understand which patients benefit from which procedure and why



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