

TYPE-1 LARYNGEAL CLEFT AND PATHOGENIC BACTERIAL GROWTH IN THE LOWER AIRWAY IN CHILDREN

Jain, Samagra¹, Tu-Anh N. Ha², Julina Ongkasuwan², David R. Spielberg³, Huirong Zhu⁴, Shailendra Das³

¹ Baylor College of Medicine, Department of Surgery, Otolaryngology

² Baylor College of Medicine, , Bobby R. Alford Department of Otolaryngology – Head and Neck Surgery, Otolaryngology

³ Baylor College of Medicine, Department of Pediatrics, Pediatrics

⁴ Texas Children's Hospital, Outcomes and Impacts Service, Outcomes and Impacts

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Background: Type-1 laryngeal clefts result from incomplete formation of the interarytenoid muscle resulting in an interarytenoid defect to the level of the true vocal folds and is reported in up to 7.6% in children. In addition to airway and swallowing impairments, aspiration in these at-risk patients can result in frequent cycles of inflammation and infection of the lower respiratory tract. We hypothesize that children with type-1 laryngeal clefts, because of increased risk for aspiration, are at increased risk of having pathogenic bacterial growth in the lower airway compared to children without a laryngeal cleft. The goal of this study is to evaluate the association between type-1 laryngeal clefts and pathogenic bacterial growth in the lower airway in children.

Materials/Methods: A retrospective chart review was conducted for all children undergoing direct laryngoscopy, flexible bronchoscopy with bronchoalveolar lavage, and esophagogastroduodenoscopy (triple endoscopy) for the first time under a single anesthetic event from January 2015 to April 2018 at an academic tertiary referral center. 217 patients were included and charts were analyzed for demographics, comorbidities, reason for referral to aerodigestive clinic, presence of type-1 laryngeal cleft, and infection course. Data were collected and managed using REDCap.

Results: Type-1 laryngeal cleft was significantly associated with pathogenic bacterial growth in the lower airway on the univariate analysis. Presence of a type-1 laryngeal cleft independently predicted culture positivity when accounting for antibiotic exposure. Moreover, type-1 laryngeal cleft was found to be a significant independent predictor of pathogenic bacterial growth in the lower airway on multivariate analysis when controlling for various comorbidities.

Conclusions: Children with type-1 laryngeal cleft are at higher risk of having pathogenic bacterial growth in the lower airway. Thus, children with chronic cough, cough with feeds, or recurrent respiratory infections could benefit from a referral to an aerodigestive center for a multidisciplinary evaluation and approach to treatment.

Images / Graph / Table

TABLE I Bronchoalveolar lavage (BAL) Growth Results.		
Category	Value	n (%)
BAL pathogenic bacterial growth (N = 75)	<i>Streptococcus pneumoniae</i>	24 (32)
	<i>Haemophilus influenzae</i>	27 (36)
	<i>Moraxella catarrhalis</i>	24 (32)
	BAL growth with >1 pathogenic bacteria species	15 (20)
BAL pathogenic bacterial colony forming units (N = 75)	1-1,000	8 (11)
	1,000-10,000	5 (7)
	10,000-100,000	28 (37)
	>100,000	34 (45)
Lipid-laden macrophages (N = 158)	Absent	37 (20)
	Present	151 (90)
Percentage of lipid-laden macrophages	Overall	12%
	No type-1 laryngeal cleft	9%
	Type-1 laryngeal cleft	11%
	No pathogenic bacterial growth in lower airway	9%
	Pathogenic bacterial growth in lower airway	12%
Percentage of macrophages	Overall	69%
	No type-1 laryngeal cleft	71%
	Type-1 laryngeal cleft	68%
	No pathogenic bacterial growth in lower airway	78%
	Pathogenic bacterial growth in lower airway	53%
Percentage of neutrophils	Overall	33%
	No type-1 laryngeal cleft	32%
	Type-1 laryngeal cleft	34%
	No pathogenic bacterial growth in lower airway	25%
	Pathogenic bacterial growth in lower airway	43%