Diagnosis & Treatment of Paradoxical Vocal Fold Motion in Infants
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Introduction
Paradoxical vocal fold motion (PVFM), also known as vocal cord dysfunction (VCD), is the untimely adduction of vocal cords during inspiration. To date, little is known regarding the pathophysiology of PVFM.

We report seven infants evaluated and diagnosed with PVFM at a tertiary medical center. The goal of our study is to investigate the patterns of presentation and clinical course of infants with paradoxical vocal fold motion (PVFM). Although this disorder has been previously reported in the literature, few studies have described this entity within the pediatric subpopulation, specifically in infants.

Methods
Patients less than 2 years of age with a diagnosis of congenital paradoxical vocal fold motion were identified using ICD-9 and ICD-10 codes. All patients presented to the Pediatric Otolaryngology clinic at Penn State Health within the last 10 years and were evaluated by the senior author. History, physical exam findings, and clinical course of treatment were reviewed and documented.

Results
Table 1. Descriptive data for infants diagnosed with paradoxical vocal fold motion.

<table>
<thead>
<tr>
<th>Patient ID No.</th>
<th>Age at Diagnosis</th>
<th>Weight Percentile at Diagnosis</th>
<th>Feeding Issues (Y/N)</th>
<th>Past Medical History</th>
<th>Voice Quality (Initial)</th>
<th>In-office FFL Findings</th>
<th>Rx for Reflux Meds (Y/N)</th>
<th>Time to resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 week</td>
<td>67.4</td>
<td>Y</td>
<td>Reflux</td>
<td>Inspiratory stridor, hoarse cry</td>
<td>PVFM, Short aryepiglottic folds, mild esophageal retroflexion, mild VF edema</td>
<td>Y</td>
<td>1.5 months</td>
</tr>
<tr>
<td>2</td>
<td>10 months</td>
<td>44.4</td>
<td>Y</td>
<td>Reflux, Pierre Robin, Speech Delay</td>
<td>Inspiratory stridor</td>
<td>PVFM, short aryepiglottic folds, omega epiglottis, mild post-epiglottic edema</td>
<td>Y</td>
<td>10 months</td>
</tr>
<tr>
<td>3</td>
<td>2 months</td>
<td>22.6</td>
<td>N</td>
<td>Reflux, Neonatal rhinitis, choanal stenosis</td>
<td>Inspiratory stridor, stertor at rest</td>
<td>PVFM, mild post-glottic edema, bilateral choanal stenosis</td>
<td>Y</td>
<td>6 months</td>
</tr>
<tr>
<td>4</td>
<td>15 months</td>
<td>75.0</td>
<td>N</td>
<td>Reflux, Asthma</td>
<td>Inspiratory stridor</td>
<td>PVFM, post-glottic edema and erythema</td>
<td>Y</td>
<td>N/A*</td>
</tr>
<tr>
<td>5</td>
<td>1 month</td>
<td>7.0</td>
<td>N</td>
<td>Reflux, Laryngomalacia, Meconium Aspiration</td>
<td>Inspiratory stridor</td>
<td>PVFM, post-glottic edema, posterior laryngeal collapse</td>
<td>Y</td>
<td>N/A*</td>
</tr>
<tr>
<td>6</td>
<td>19 months</td>
<td>37.0</td>
<td>N</td>
<td>Developmental delay, Asthma</td>
<td>Quiet inspiratory sound without stridor</td>
<td>PVFM, posterior laryngeal collapse</td>
<td>Y</td>
<td>6 months</td>
</tr>
<tr>
<td>7</td>
<td>2 months</td>
<td>53.8</td>
<td>N</td>
<td>Bilateral polyactyly</td>
<td>Inspiratory stridor</td>
<td>PVFM, post-glottic edema and erythema</td>
<td>Y</td>
<td>LTF</td>
</tr>
</tbody>
</table>

Mean (±SD) 7.03 months (0.64) 43.90 (0.24) 5.88 months (3.47)

FFL=flexible fiberoptic laryngoscopy
PVFM=paradoxical vocal fold motion
LTF=lost to follow-up
*N/A indicates that PVFM is not resolved and patient is still under treatment

Discussion
Three categories of PVFM have been described: psychogenic, exertional, and irritant-associated. Our study reflects a high rate of irritant-associated vocal fold dysfunction, and, therefore, GERD should be a primary consideration to target while treating PVFM in infants. As for the other etiologies, it is less likely that infants would suffer from exertional or psychiatric due to their activity levels and cognitive abilities at this young age. Although vocal cord dysfunction may be distressing, pediatric patients and parents, should be reassured that the disorder is treatable. Awareness of the common presentation, parental observations, and physical exam findings is critical to properly diagnose and treat these patients. The clinician must therefore be cognizant of early signs and symptoms that may indicate a child is in fact suffering from vocal cord dysfunction.

References