

Editorial

Incidence of Vocal Fold Immobility in Patients with Dysphagia

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In order of teleological importance, the human larynx plays pivotal roles in airway protection, respiration, and phonation [1]. With respect to deglutition, the larynx has both intrinsic functions such as airway protection resulting from supraglottic/glottic closure as well as extrinsic functions such as opening of the upper esophageal sphincter with laryngeal elevation. Despite these roles, historically, the phonatory disability arising from unilateral vocal cord immobility (UVCI) has received considerably more attention and scientific investigation; the swallowing impact of UVCI has been, to some degree, neglected.

In this issue, Leder and Ross revisit the impact of UVCI on deglutition with some novel application [2]. The authors present their experience with fiberoptic endoscopic evaluation of swallowing (FEES) in evaluating a large hospital-based cohort of patients of whom some were diagnosed with new onset UVCI. It is important to note that the denominator or the population from which this cohort was derived consisted of a referral cohort being evaluated with primary symptoms of dysphagia in a tertiary care hospital-based environment. From this dysphagic population, a subset of patients with UVCI was identified and subjected to further study. Because this was a patient population that was specifically referred for evaluation of dysphagia, their study was limited by selection bias in its ability to determine the incidence of aspiration and dysphagia in patients with UVCI.

Rather, the authors were comparing the dysphagia (and aspiration) occurring in patients with UVCI to the dysphagia occurring in a population of patients referred for evaluation of dysphagia. This is in contrast to the study published by Bhattacharyya et al. [3] in which patient selection began with a diagnosis of UVCI and subsequent evaluation for the diagnostic cohort included videofluoroscopic (VFS) evaluation of swallowing regardless of symptomatology. Their study found an incidence of penetration and aspiration of 31.3% and 23.4% in newly diagnosed UVCI, respectively. Those results were similar to the series published by Heitmiller et al. [4], although again patients with UVCI were identified from a referral population undergoing evaluation for dysphagia.

Although Leder and Ross point out that the higher incidence of penetration and aspiration in their study may be due to timing factors and the acuity of UVCI diagnosis, it is also possible that the higher rates of aspiration may be secondary to the fact that patients with UVCI in their study were extracted from a referral population likely already with symptoms referring for evaluation of dysphagia.

Although Leder and Ross do not present any specific inferential statistical analysis, some information can be additionally gleaned from the data provided. By reconstructing a cross tabulation of the data for patients with and without UVCI against those with and without aspiration, odds ratios may be computed. Specifically, in this population of patients referred for evaluation of dysphagia, a diagnosis of UVCI confers an odds ratio of 2.0 for aspiration (95% confidence interval, 1.3–3.2) over the

remaining population undergoing evaluation for dysphagia without UVCI. Since this confidence interval does not include 1.0, it can be statistically inferred that patients with UVCI and symptoms of dysphagia have twice the odds of aspiration, even among an already dysphagic population. Chi-squared analysis of the data produces the same conclusion ($\chi^2 = 9.44$, $p \leq 0.01$). Thus, the authors have provided valuable information regarding the specific functional impact on deglutition and diet for patients with UVCI in this specific setting: UVCI imparts a significant risk specifically for the dysphagia components of penetration and aspiration. The authors also confirm previous work showing that aspiration in the UVCI patient population tends to occur after the swallow, often due to bolus retention (residue) [3].

One important facet of the Leder and Ross study is that it is one of the few that specifically uses FEES in a large patient population for the evaluation of patients with UVCI and dysphagia. The fiberoptic component of the FEES has the appealing benefit of diagnosing neurologic abnormalities, both sensory and/or motor, of the larynx simultaneously with the swallowing evaluation. However, as the authors correctly point out, the main difficulty with FEES in the evaluation of penetration/aspiration is the “whiteout” period at the time of lingual and pharyngeal compression near the tip of the fiberoptic scope. In addition, the depth of laryngeal penetration may be difficult to assess based on parallax and the angle of viewing. Whether these deficiencies are offset by the advantages of immediate sensory and motor assessment of the larynx is a matter of debate. In addition, standardization of FEES results may be difficult across investigators, further adding to variability in the assessment of penetration and aspiration. From a research perspective, there may be a bias introduced based on the fact that the diagnosis of UVCI is immediately apparent to the investigator conducting the FEES. Once the investigator has identified a UVCI, he/she may be much more attuned to the possibility of aspiration given its immense clinical consequences in the setting of a UVCI diagnosis. Thus, there may be a diagnostic bias toward identification of aspiration in this study.

Many questions still remain as to the pathophysiology of dysphagia and aspiration in patients with UVCI. Still, further questions remain as to the optimal treatment strategies for patients with UVCI [3,5]. One of the major problems in studying dysphagia associated with UVCI is the role of comorbidities. Oftentimes, patients with newly diagnosed UVCI are recently status post cervical or thoracic surgery, cerebrovascular accident, or undergoing treatment for thoracic malignancy. These comorbidities may substantially affect deglutition in and of themselves. Thus, identifying the true effect of UVCI on dysphagia and aspiration may be confounded. The current data corroborate previous work, reinforcing what has been a long-standing clinical rule of thumb, that patients with UVCI fare better with thickened or puréed consistencies as opposed to thin liquids. However, the reasons for this are not exactly clear; some data have suggested that bolus residue is one of the factors leading to delayed aspiration in the setting of UVCI, and bolus residue is frequently enhanced by thickened consistencies. Although evidence and understanding are increasing with respect to the dysphagia and aspiration consequences of UVCI, much more work must be done to enhance our understanding of the pathophysiological mechanisms responsible, with the ultimate goal of adapting medical and surgical treatment strategies for the dysphagia that these patients experience.

Reference

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