Correlating Videofluoroscopic Swallow Study Findings With Subjective Globus Location

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Objective: Patients with globus, the sensation of something stuck in the throat, are evaluated by otolaryngologists, gastroenterologists, and speech pathologists and often undergo multiple tests and interventions. We hypothesize that a videofluoroscopic swallow study (VFSS) is useful to characterize globus etiology and correlate subjective globus location to atypical VFSS findings.

Method: Retrospective chart review of all patients undergoing VFSS over a 24-month period with a primary complaint of globus. Globus was characterized by the patient as above the thyroid notch, between the thyroid notch and sternum, or substernal. VFSS findings were categorized as oropharyngeal, pharyngoesophageal, or esophageal based on nine VFSS abnormalities and then further broken out for subgroup analyses.

Results: Of 216 patients meeting study criteria, 109 patients localized globus above the thyroid notch, 74 between the thyroid notch and sternum, and 33 substernal. One hundred ninety-five patients (90.3%) had at least one finding on VFSS that could account for symptoms, and the majority had multiple. In fact, 21 patients (9.7%) with dysphagia localized above the thyroid notch had evidence of distal esophageal abnormalities, and 15 (6.9%) with dysphagia localized substernal had oropharyngeal abnormalities.

Conclusion: Whereas VFSS was likely to identify abnormalities, these areas relate poorly overall with the patient’s subjective globus location, and the clinical utility of the study is questionable.

Key Words: dysphagia, globus, videofluoroscopic swallow study.

Level of Evidence: 4

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INTRODUCTION

Globus pharyngeus is a subjective complaint describing the sensation of a foreign body or tightness in the throat. Globus is a relatively common patient complaint evaluated by otolaryngologists, gastroenterologists, and speech language pathologists. In a survey conducted in the United States, it was estimated that 46% of adults experience globus sensation at some point, and globus comprises 4% of otolaryngology referrals.1-4 There is no clearly defined etiology for globus, but many possible causes have been suggested with varying supporting evidence, including cricopharyngeal spasm, cervical spine osteophytes, lingual tonsil hypertrophy, and iron deficiency anemia.2 An association of globus sensation with a diagnosis of gastroesophageal reflux disorder (GERD) is perhaps the most commonly proposed etiology, but studies using a variety of diagnostic tools including esophagogastroduodenoscopy (EGD) and 24-hour pH monitoring have shown a wide range of figures from 15% to 70% of patients with globus have objective reflux findings.5-6

As a result of this ill-defined symptom characterization and pathophysiology, patients presenting with the complaint of globus are often seen by multiple providers, and they do not undergo a standardized workup.2 A survey of otolaryngologists in the United Kingdom revealed that rigid endoscopy and barium esophagram were the most common procedures performed to evaluate patients with globus, performed in 61% and 56% of patients, respectively.7 However, the utility of these endoscopic and radiologic studies in the diagnosis and treatment for globus is controversial, with a 2010 retrospective review suggesting the primary complaint of globus (without other symptoms of dysphagia, odynophagia, or constitutional symptoms) requires only a thorough history and physical exam, including flexible laryngoscopy.2 A small Finnish study found no significant abnormal findings in 22 patients undergoing videofluoroscopy with primary globus symptoms.8 In an Indian study of 908 patients with globus, low sensitivity and positive predictive values

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of a barium esophagram suggest that it is of limited clinical utility in this patient population.9

Patients with globus commonly undergo a videofluoroscopic swallow study (VFSS) with a speech language pathologist when there is a complaint of globus symptoms without evidence of GERD or physical exam/ videolaryngoscopic abnormalities. To better understand the link between VFSS findings and patient history, our study aimed to determine if a patient’s subjective location of globus (above the thyroid notch, between the thyroid notch and sternum, or substernal) corresponds to abnormalities noted on videofluoroscopy. The goal is that these results may result in more directed use of videofluoroscopy for patients with globus.

MATERIALS AND METHODS

Subjects
As part of a performance-improved project evaluating the clinical utility of videofluoroscopy for patients with globus by speech language pathologists, a retrospective chart review was performed on patients undergoing a VFSS, either inpatient or outpatient, through a speech-language pathology service at a South Texas Veteran’s Administration Health Care System (STVHCS), Audie L. Murphy Division. These studies were reviewed over a 24-month period to critically evaluate the clinical utility of VFSS in the workup of unexplained globus to optimize use of fluoroscopy and potentially reduce fluoroscopy exposure in low-yield settings. Further analysis was performed on patients who had VFSS performed for primary complaint of globus pharyngeus. Collected patient data included demographics, history of neurologic disease, GERD, upper aerodigestive malignancy, voice or swallowing complaints, and subjective localization of globus (above the thyroid notch, between the thyroid notch and sternum, or substernal). Referral pattern for VFSS was also recorded. Patients were excluded from analysis if their primary complaint was not globus, if subjective globus site was not recorded in the chart, or if their VFSS analysis was incomplete.

Videofluoroscopic Swallow Study
Patients at the STVHCS underwent VFSS in the presence of a radiologist who commented on any pharyngoesophageal segment or esophageal abnormalities. Standard items evaluated during the VFSS are listed in Table I. Items from Table I in the oral and pharyngeal stage of swallow were quantified as normal or abnormal in this study because there was not a universal assessment protocol for VFSS studies performed by multiple speech pathologists. The pharyngoesophageal segment and esophageal stage were assessed with the radiologist without a speech pathologist when there is a complaint of globus pharyngeus, with 216 (28.4%) reporting globus as their primary complaint. In this group, patient ages ranged from 27 to 94 years with a mean of 63 years old (standard deviation = 13.4 years) and were 83% male and 17% female. Of the 216 patients, 124 had available medical histories recorded, the results of which are included in Table II. Of the 216 patients with primary globus, the link between VFSS findings and globus location to the categorical information recorded on location of abnormality during VFSS, a chi-square test was selected for analysis. A Pearson’s chi-square test was performed on the categorical values using JMP version 13.0 (SAS Corp, Cary, NC).

Statistical Analysis
Descriptive statistics were performed on demographic and other recorded information. Given the hypothesis testing correlating subjective globus location to the categorical information recorded on location of abnormality during VFSS, a chi-square test was selected for analysis. A Pearson’s chi-square test was performed on the categorical values using JMP version 13.0 (SAS Corp, Cary, NC).

RESULTS
Patients and Diagnosis
During the study period, 760 patients had VFSS performed at STVHCS. Two hundred ninety-six of these patients (38.9%) reported symptoms of globus pharyngeus, with 216 (28.4%) reporting globus as their primary complaint. In this group, patient ages ranged from 27 to 94 years with a mean of 63 years old (standard deviation = 13.4 years) and were 83% male and 17% female. Of the 216 patients, 124 had available medical histories recorded, the results of which are included in Table II. Of the 216 patients with primary globus,
109 (50.5%) people localized their symptoms above the thyroid notch, 74 (34.2%) between the thyroid notch and sternum, and 33 (15.2%) substernal. Also, 195 patients (90.3%) had at least one finding on VFSS that could account for symptoms, and the majority had multiple. Evaluating the type of abnormalities, 156 (72.2%) patients had pharyngoesophageal segment (PES) abnormality; 99 (45.8%) had an esophageal abnormality; and 91 (42.1%) had an oropharynx abnormality. The most commonly identified abnormality was retained bolus in 116 (53.7%) at some level along the VFSS, with 39 of these in the proximal esophagus, 54 in the mid-esophagus, and 56 in the distal esophagus (some patients with retained bolus in more than one location). In total, 57 patients were found to have some cervical spine abnormality (26.4%). Of the 216 patients, the referral source was recorded for 79 patients: 55 patients were referred from gastroenterology and 24 from otolaryngology. Two patients were found to have a Zenker diverticulum. Eleven patients had aspiration on VFSS.

**Association Between Patient Localization and VFSS Findings**

No significant correlation was found between subjective location of globus and region of abnormal findings on VFSS. On subgroup analysis, including the subfindings with each region of subjective globus, a correlation existed between a sternum location of symptoms and retained boluses at the mid-esophageal level. Of the 54 patients who had this VFSS abnormality, 17 reported symptoms above the thyroid cartilage, with 10 and 27 reporting symptoms between and below the thyroid notch, respectively ($P = .005$). Interestingly, 21 of the 56 patients with a retained bolus in the distal esophagus reported symptoms above the thyroid notch ($P = .07$).

**DISCUSSION**

Globus pharyngeus is a common complaint that may present in otolaryngology, speech-language pathology, and gastroenterology practices. There is not a defined diagnostic workup or treatment plan for globus, and it is thought to be a multifactorial complaint.\(^2\)\(^,\)\(^7\)\(^,\)\(^10\) Gastroenterology research has focused largely on investigating the association of GERD with globus symptoms using manometry and dual-channel impedance studies. Although these studies have established a correlation between GERD and globus, no causal relationship has been established, particularly when focusing on extraesophageal reflux symptoms and findings.\(^11\)\(^,\)\(^12\) The otolaryngology approach to globus pharyngeus is somewhat distinct from that of gastroenterologists because otolaryngologists rule out oropharyngeal, laryngeal, and upper aerodigestive malignancy, although multiple recent studies have shown an exceedingly low likelihood of malignancy in patients with typical globus symptoms.\(^10\)\(^,\)\(^13\)\(^,\)\(^14\) A retrospective review of 250 cases of rigid endoscopy performed for primary globus failed to reveal any malignancies.\(^13\) Additionally, two retrospective reviews with a combined population of over 3 thousand patients who underwent barium esophagram for typical globus symptoms did not identify any malignant lesions.\(^10\)\(^,\)\(^14\) Although barium swallow is known to have low sensitivity for the evaluation of upper aerodigestive malignancy, the test is still used frequently; radiographic swallow evaluation was ordered by 56% of consultants for globus in a U.K. survey of otolaryngologists.\(^7\)

Data from our institution also suggests that radiographic swallow evaluation is a common diagnostic tool used by physicians in the workup of globus symptoms. Of the 760 patients undergoing VFSS over a 24-month period at our facility, 38% were performed for a primary complaint of globus. Similar to previously reported data, no VFSS suggested a new upper aerodigestive tract malignancy. Our data did reveal that the majority of patients (90%) with a primary complaint of globus had at least one radiographic abnormality on VFSS. The most common abnormality was a retained bolus at some point along the esophagus.

Similar studies investigating the correlation of symptom localization with objective findings have been performed for the complaint of dysphagia with variable results. The reliability of a patient’s subjective globus location has clinical implications because it determines the usefulness of a patient’s subjective sensation in driving the diagnostic and treatment pathway. A 2017 retrospective review of 726 patients with dysphagia showed that 48% of patients accurately predicted the location of obstructive pathology, with upper esophageal pathology having the most reliable localization.\(^15\) Another prospective study showed that patients with an esophageal stricture and a complaint of dysphagia were able to accurately localize their level of esophageal obstruction within 4 cm.\(^16\) Conversely, our results suggest that there is no real correlation between globus symptom location and objective VFSS findings. A notable exception is the lack of correlation in patients having retained bolus in the mid-esophageal segment on VFSS: these patients were significantly more likely to have substernal globus symptoms ($P < .005$). The correlation toward globus symptoms below the thyroid notch continued for retained boluses in the distal esophagus but was not statistically significant ($P = .07$). Despite this statistical significance, however, 17 of the 54 patients with a retained bolus at the mid-esophagus still reported their symptoms above the thyroid notch.
Overall, this data suggests that symptom localization is not an accurate assessment of where abnormalities may occur on VFSS in patients with primary globus pharyngeus. Although not correlating subjective globus location and VFSS abnormalities, this study highlights that VFSS is a common diagnostic tool in the workup of globus complaints and has a high likelihood of revealing some abnormality that could potentially cause globus. Evaluating the utility of this diagnostic tool was beyond the scope of this study because no treatment outcomes were examined. However, the wide variety of abnormalities found on VFSS in patients with a primary complaint of globus perhaps indicates that VFSS may not be useful to guide treatment for globus symptoms.

There are several limitations to our study, some inherent to the retrospective nature of this study. The most significant of these is that, although many patients with globus had an abnormality identified on VFSS, there is insufficient treatment data to determine that identified abnormalities were linked to the globus symptom because many patients chose not to pursue further treatment. Data was unavailable for many patients on whether further interventions were performed to manage findings found of VFSS. In addition, esophageal findings were observational by the radiologist given the nature of contrast and the procedure used in VFSS. The final limitation is that VFSS interpretation was performed by more than one speech-language pathologist, although all providers used the same grading criteria. Future prospective studies with uniform VFSS interpretation and longitudinal assessment of the impact of interventions on abnormal VFSS findings to globus complaints would resolve many of the current study limitations.

CONCLUSION

This study indicates that the perceived region of globus sensation does not necessarily indicate the level of abnormality found on VFSS. Further, it indicates that VFSS may not be a specific enough diagnostic tool for patients with primary globus pharyngeus to warrant its routine use in the workup of this complaint.

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BIBLIOGRAPHY