Introduction
Glottic incompetence (GI) describes incomplete or improper closure of the true vocal cords during phonation. This is caused by a variety of disorders including vocal fold paralysis/paresis, atrophy, and scar. Patients typically present with a variety of symptoms including dysphonia, decreased vocal volume, and dysphagia. Procedures to temporarily relieve symptoms can be performed early in the course of therapy, however long term options are required for some patients. Medialization thyroplasty with gore-tex implants (GTP) is one choice for long term improvement of symptoms. In previous studies, results following this procedure varied depending on etiology of GI. We utilized the voice-related quality of life outcomes (VRQOL) scale, glottal function index (GFI), and GRBAS, an assessment of overall grade, roughness of voice, breathiness, asthenia, and strain. The objective of this study, is to compare VRQOL outcomes longitudinally of patients with various etiologies resulting in GI, following GTP.

Methods and Materials
A Retrospective review of patients treated by the senior author was conducted. All patients with non-paralytic glottic incompetence, treated with GTP were included in the study. Forty-eight patients were identified and included. Diagnosis of each patient was made by the senior author after complete voice evaluation with multidimensional voice evaluation including strobolaryngoscopy and perceptual voice assessments. We collected voice assessments including VRQOL, GFI, and GRBAS at the initial and all serial follow-up appointments to determine the direction and magnitude of changes across the post-operative course. Diagnostic subgroups including atrophy, scar, vocal fold paresis and vocal fold hypomobility were compared relative to their longitudinal course.

Medialization Thyroplasty
Fig 1: Example of patient with unilateral vocal cord atrophy.
Fig 2: Intraoperative photo of medialization thyroplasty.

Results
Forty-eight patients, 27 females, 21 males, ages 12-86 were identified. The distribution of diagnoses was vocal fold paresis -12, hypomobility-20, scar-7, and atrophy-9. Follow-up ranged from 1 month to 3 years. Mean follow-up was 11 months. All patients in the study had pre and post-operative VRQOL questionnaires. Ninety-five percent (46/48) of cohort reported overall QOL improvement based on these scores. The entire GI cohort reported an average 30-point improvement in their voice outcomes at their final post-operative appointment. Thirty-one patients (64%) reported improvement at each follow-up appointment, while 16/48 (33%) patients reported initial improvement and subsequent decline from their maximal VRQOL measures. Only one patient reported a decrease in their QOL scores after surgery.

Assessment Tools
Fig 3: Longitudinal VRQOL results grouped by etiology. VRQOL responses for each patient cohort were averaged at 3, 6, 12, and 18 months after surgery.

Conclusions
GTP remains a mainstay of long-term therapy for patients with GI. Based on QOL measures, patients report an overall improvement in their QOL after surgery. A component of the cohort did demonstrate initial improvement that then declined over time. This drop was seen at about one year following their procedure. While this decline was noted in the data, 95% of patients reported overall improvement in their symptoms over longitudinal follow-up. Overall, we found that patients with vocal fold hypomobility do better overall compared to other diagnoses.

Discussion
Medialization thyroplasty remains the procedure of choice for improvement of glottic incompetence due to a variety of diagnoses. Compared to short term improvement from typical injection procedures, GTP offers a long-term symptomatic improvement. In the present study, patients with GI due to hypomobility, VFP, scar, or atrophy were assessed for longitudinal quality of life changes following GTP. Overall, the hypomobility group demonstrated greater improvement following surgery compared to atrophy and scar. Overall, patient VRQOL measures continued to improved over the first year. Although scores were noted to decrease thereafter, a significant improvement over the pre-operative baseline was still realized across all diagnoses. The magnitude of VRQOL change was greatest in the period immediately following surgery, with decrease of improvement over time. Of the 48 patients, 17 were found to have some decrease in scores over longitudinal follow-up. Some of the changes may be accounted for by the recognized contraction in size of gore-tex implants over time. One limitation to our study is the inconsistency of follow-up timing for all patients in the cohort. This makes analysis at standardized time points difficult in this study.

References