

BACKGROUND

Posterior glottic insufficiency (PGI) is a potential sequela of prolonged intubation. Sustained pressure from the endotracheal tube results in ulceration, erosion of the vocal process, and subsequent tissue loss in the posterior glottis. The resultant defect results in air escape during phonation.

Clinically, patients with PGI present with a breathy voice, decreased maximum phonation time, and psychosocial stressors related to vocal handicap. The tight adherence of the mucosa on the arytenoid often precludes injection augmentation. In addition, laryngeal framework surgery often fails to correct the posterior glottic defect. Other procedures have been described with some success. However, these approaches may diminish airway caliber and may require intubation or tracheostomy during the recovery period.

Herein, we describe a novel technique and outcomes for an endoscopic posterior rotational flap for the treatment of PGI.

METHODS

With BCM IRB approval (H-50056), a retrospective review was performed in patients undergoing endoscopic posterior rotation flap for PGI between October 2018 and April 2021. The diagnosis of PGI was established following awake laryngoscopy to confirm vocal fold mobility and adequate closure of the membranous vocal folds and direct laryngoscopy with inspection of the vocal processes. Pre- and postoperative assessments included the Pediatric Voice Related Quality of Life (PVRQOL) questionnaire and the Consensus Auditory Perceptual Evaluation of Voice (CAPE-V) performed by trained speech language pathologists. Objective voice measures including maximum phonation time were obtained. Post operative data were collected between 1 and 6 months post-op.

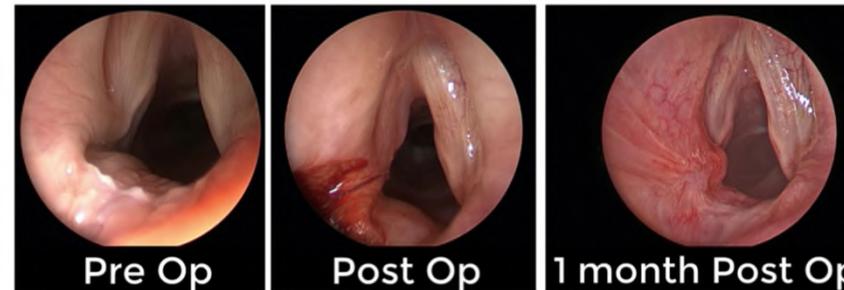


Fig. 1. Still images demonstrating a posterior glottic insufficiency with a deep trough (left), immediately postoperative with endoscopic posterior rotation flap sutured into place and filling the trough (middle), and 1 month postoperatively with a well-healed rotational flap filling the prior defect (right). [Color figure can be viewed in the online issue, which is available at www.laryngoscope.com.]

TABLE I.
Patient Characteristics

Case #	Gender	Age at Surgery (Yr)	Unilateral or Bilateral	Comorbidities
1	Female	16	Unilateral	26-wk preemie, 7-mo NICU stay, 6-7 intubations
2	Female	17	Bilateral	25-wk preemie, 5-mo NICU stay, prolonged intubation
3	Male	11	Bilateral	27-wk preemie, cerebral palsy, prolonged intubation, SGS, bilateral VF hypomobility s/p LTR, and cordotomy
4	Female	10	Unilateral	24-wk preemie, prolonged intubation, asthma
5	Female	12	Bilateral	26-wk preemie, prolonged intubation

LTR = laryngotracheal reconstruction; SGS = subglottic stenosis; VF = vocal fold.

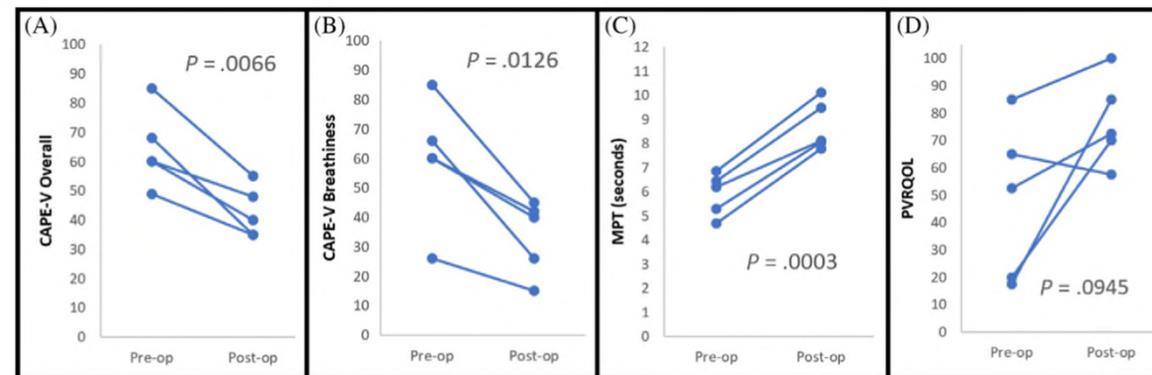


Fig. 2. Results demonstrating significant improvement in (a) Consensus Auditory Perceptual Evaluation of Voice (CAPE-V) overall ($P = .0066$), (b) CAPE-V breathiness ($P = .0126$), and (c) maximum phonation time (MPT) ($P = .0003$). (d) Pediatric Voice Related Quality of Life (PVRQOL) trended toward improvement without statistical significance ($P = .0945$). [Color figure can be viewed in the online issue, which is available at www.laryngoscope.com.]

SURGICAL TECHNIQUE

A CO₂ laser is used to create a medially based mucosal and subcutaneous tissue U-shape flap along the medial surface of the arytenoid. Dissection proceeds lateral to the trough. A laryngeal flap elevator is used to tunnel a pocket underneath the trough. Next, the flap is demucosalized using the CO₂ laser, to minimize the risk of a postoperative mucocele. The lateral edges of the flap are then folded and tucked deep into the pocket. The flap is tacked in a folded position endoscopically with 6-0 Vicryl suture.

RESULTS

Five patients with PGI underwent the endoscopic posterior rotation flap, three of which were bilateral. Baseline characteristics are shown in Table I. No adverse events were encountered. Findings as shown in Figure 2 demonstrated significant improvement in CAPE-V overall ($P = .0066$), CAPE-V breathiness ($P = .0126$), and MPT ($P = .0003$). PVRQOL trended toward improvement without statistical significance ($P = .0945$).

CONCLUSIONS

PGI is a challenging clinical entity for diagnosis as well as treatment. Previous management options have been described with some success but are limited as most diminish airway caliber possibly requiring intubation or tracheostomy during the recovery period. Our novel technique provides a safe treatment for PGI with promising results in our cohort.

REFERENCES

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