In-Office Balloon Dilation: A Novel Protocol for Idiopathic Subglottic Stenosis

Catherine F. Roy[1], Antonia Lagos-Villaseca[1], Jennifer Silver[1], José A. Correa PhD[2], Eli Layous[1], Jonathan Young[1], Anne V Gonzalez[3], Karen Kost[1]

Departments of 1) Otolaryngology Head & Neck Surgery, 2) Mathematics and Statistics and 3) Respiratory Medicine, McGill University Health Centre, Montreal, Canada

Background

- Idiopathic subglottic stenosis (iSGS) = a debilitating and recurrent fibroinflammatory disease of the airway, with a profound impact on quality of life

Objective

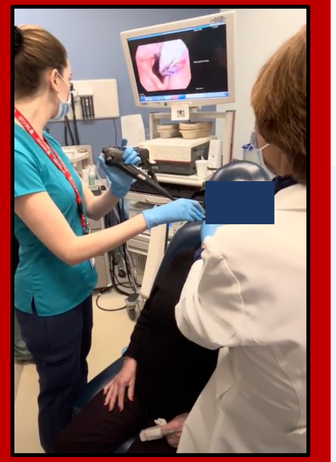
- Investigate the safety and efficacy of a novel protocol for in-office balloon dilation (BD) under local anesthesia for iSGS

Methodology

- Prospective study of all adult patients with Cotton-Myer Grade I-II iSGS undergoing in-office BD at the **Voice Laboratory of the Royal Victoria Hospital**
- June 1, 2022 – August 1, 2023
- **Outcome measures:**
  - Patient-reported outcomes
  - Validated symptom scales (Dyspnea Index, modified Medical Research Council (mMRC) dyspnea scale and Voice Handicap Index-10 (VHI-10)
  - Airway diameter by nasolaryngoscopy
  - Normalized peak expiratory flow (PEF%) on spirometry

PROCEDURE

- **Setting**: Outpatient clinic in quaternary care hospital + access to emergency equipment
- Safety hand gestures reviewed with patient
- Continuous O_2 monitoring
- Topicalization 3% lidocaine + 0.25% phenylephrine (nebulized + instilled above vocal folds)
- Transnasal high-compliance balloon inflated under visualization for 30 seconds or until patient signals to deflate



Results

Patient demographics	N=11 patients
Gender (F:M)	10:1
Age (mean ± s.d.)	56.0 ± 12.3 years
Comorbidities (%, N)	
Hypertension	54.5% (6/11)
Hypothyroidism	36.4% (4/11)
Asthma	18.2% (2/11)
Gastroesophageal reflux disorder	18.2% (2/11)
Dyslipidemia	9.1% (1/11)
Depression	9.1% (1/11)
Disease characteristics	
Length of time since initial diagnosis	48.9 months (range 4-144)
Prior surgeries	
Balloon dilation, laser, steroid injection under general anesthesia	54.5% (6/11) Range 1-6 procedures
None	45.5% (5/11)

DYSPNEA & VOICE SCORES

- **Dyspnea index ⇩**
  31(26.5-32) → 6 (4-13), median difference 23 (95% C.I. 28;8, P=0.003)
- **VHI-10 ⇩**
  13 (6.5-23) → 5 (1.5-9.5), median difference 7 (95% C.I. 18;4, P=0.002)
- **mMRC ⇩**
  Decreased in 9 patients, stable in 1, increased from 0 to 1 in 1 patient

SPIROMETRY & NASOLARYNGOSCOPY

- **Normalized PEF% ⇧**
  62% (54-99) → 99% (88.5-109.5), median increase 27% (95% C.I. 19;40%, P=0.004)
- **Estimated degree of stenosis ⇩**
  40% (30-55) → 10% (5-17.5), median difference of 25% (95% C.I. 15;45, P=0.003)

TOLERANCE & ADVERSE EVENTS

- **Preference for setting**
  6/6 patients having previously undergone the procedure under GA preferred in-office.
- **Pain**
  Median VAS pain score 3 (IQR 1.5;5)
- **Adverse events**
  Minor subjective dyspnea lasting 2 days (N=2), odynophagia (N=2), mild cough (N=1)

Conclusion

In-office balloon dilation under local anesthesia is a safe and effective option for the management of mild-moderate iSGS, as demonstrated by improved patient-reported outcomes, degree of stenosis and spirometry parameters with minimal associated morbidity.