



BACKGROUND

- Central Airway Obstruction (CAO) often suffers from high restenosis rates after mechanical dilation
- Liquid nitrogen-based Spray Cryotherapy (SCT) at -196°C induces controlled tissue necrosis while preserving extracellular matrix collagen (the key to reducing scarring)
- This study evaluates the safety and clinical efficacy of SCT in managing CAO across a diverse range of inflammatory, autoimmune, and idiopathic diseases

METHODS

- Design:** Single-center retrospective review (N=56) from July 2023 - November 2025
- Setting:** Hackensack Meridian JFK University Medical Center
- Intervention:** SCT application followed by mechanical balloon dilation or radial incision
- Data Source:** Epic electronic medical record system
- Outcome measures:** Rate of reintervention, and reintervention free interval (RFI) in one year after the SCT
- Analysis:** Mann-Whitney U Test with Descriptive analyses

RESULTS

Cohort Profile: 80% Female; 86% laryngotracheal involvement

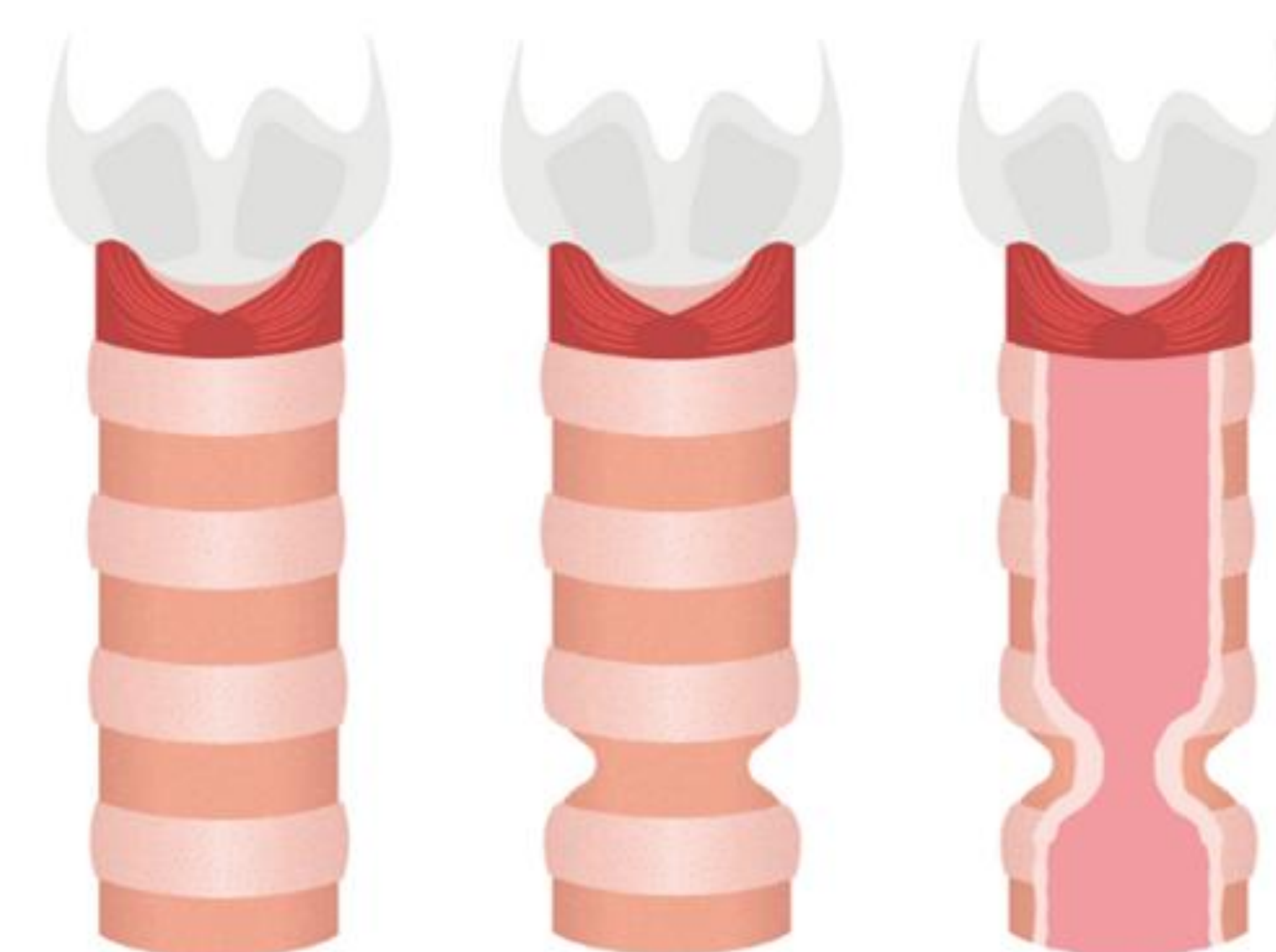
Primary Etiologies:

- Idiopathic Stenosis (45%)
- Granulomatosis with polyangiitis (GPA; 29%)
- Post-traumatic/Post-intubation (PT/PI; 18%)

Outcomes:

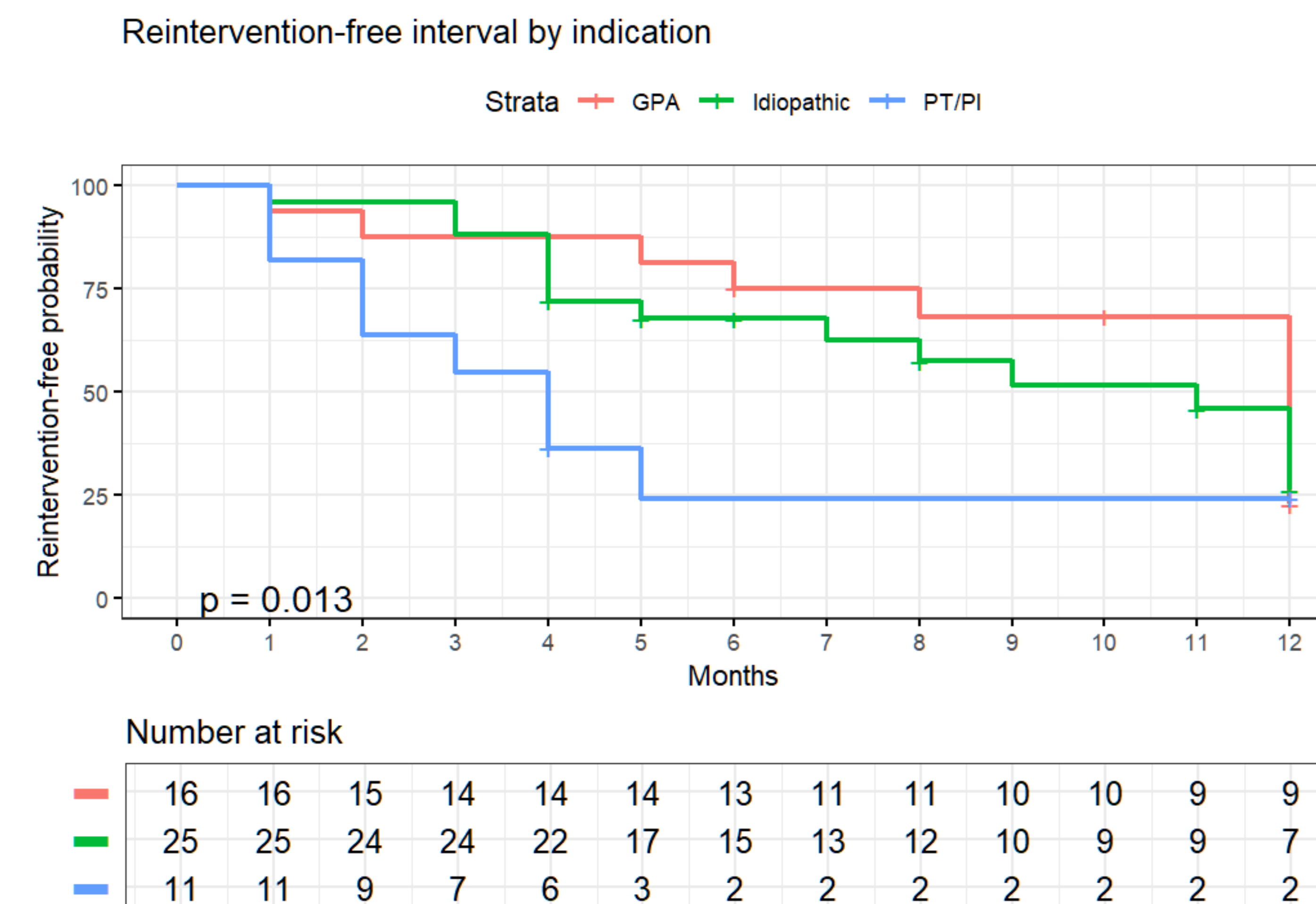
- 55% had recurrence following SCT in their first year, representing a clinical improvement over the 75-85% recurrence rates reported for other dilation-based modalities

- Significant earlier recurrence was seen in patients with PT/PI stenosis (median 2.5 months) compared to idiopathic (4.0 months) and GPA-related disease (5.5 months) ($p < 0.05$)
- Higher number of sprays correlated with fewer restenoses (couldn't reach significance).
- RFI was 7-8 months (median)
- Reintervention-free probability at 1, 6, and 12 months was 92.9%, 58.5%, and 45.1%, respectively



NORMAL
TRACHEA

TRACHEAL STENOSIS



LIMITATIONS

- Retrospective design
- Single-center study (limits generalizability)
- Small sample size
- Non-parametric statistical methods

CONCLUSIONS

- SCT is a safe alternative to heat-based modalities.
- Demonstrates superior durability for inflammatory and idiopathic stenosis.
- Clinical Takeaway: Treatment strategies should be pathology-specific, as PT/PI patients require more frequent reintervention.

REFERENCES

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