

# Posterior nasal nerve surgical neurectomy versus ablation for chronic rhinitis

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# Introduction to Chronic Rhinitis and Treatment Targets

- Background
  - Chronic rhinitis (both allergic and non-allergic)
- The Challenge
  - Medical interventions are **ineffective** in up to 20% of patients
- The Target
  - target the **posterior nasal nerve (PNN)**, **parasympathetic fibers**
- Improvement of Neurectomy
  - **traditional vidian neurectomy**  
**dry eye complications**

# Comparing PNN Procedural Options

- In-Office Ablation (Cryoablation or Radiofrequency)
  - increasingly popular, **local anesthesia**
- Surgical PNN Neurectomy
  - **general anesthesia**, targets distal parasympathetic fibers

# Study Methodology

- **Study Design**
  - A retrospective review
- **Patient Cohort**
  - 55 patients with chronic rhinitis
- **Treatment Groups**
  - 34 patients received in-office PNN ablation
  - 26 received surgical neurectomy.
  - 9 patients underwent both procedures
- **Outcome Measurement**
  - **SNOT-22 questionnaire**  
rhinologic subdomain  
**MCID**(Minimal Clinically Important Difference)

**Table 1**

Demographic and clinical characteristics of office ablation and neurectomy cohorts.

	Total cohort ( <i>N</i> = 55)	Ablation ( <i>N</i> = 34)	Neurectomy ( <i>N</i> = 26)	<i>p</i> - Value
Age	59.0 +/- 17.9	59.4 +/- 19.4	58.3 +/- 15.3	0.81
Sex (male, female)	28M, 27F	20M, 14F	11M, 15F	0.21
Chronic rhinitis subtype				
Allergic	18 (32.7 %)	14 (41.1 %)	7 (26.9 %)	0.25
Non-allergic	37 (67.3 %)	20 (58.8 %)	19 (73.1 %)	0.25
Co-morbidities				
GERD	25 (45.5 %)	15 (44.1 %)	14 (53.8 %)	0.46
Asthma	18 (32.7 %)	11 (32.4 %)	10 (38.5 %)	0.62
Smoking history				
Never	37 (67.3 %)	23 (67.6 %)	17 (65.4 %)	0.86
Former	17 (30.9 %)	11 (32.4 %)	8 (30.8 %)	0.90
Current	1 (1.8 %)	0 (0.0 %)	1 (3.8 %)	0.25
Past surgical history				
Turbinate reduction	16 (29.1 %)	8 (23.5 %)	8 (30.8 %)	0.53
Septoplasty	15 (26.0 %)	8 (23.5 %)	8 (30.8 %)	0.53
Sinus surgery	11 (20.0 %)	7 (20.6 %)	6 (23.1 %)	0.82
Medications				
Ipratropium spray	55 (100.0 %)	34 (100.0 %)	26 (100.0 %)	–
Corticosteroid spray	49 (89.1 %)	30 (88.2 %)	23 (88.5 %)	0.98
Corticosteroid rinse	33 (60.0 %)	21 (61.8 %)	15 (57.7 %)	0.75
Antihistamine spray	41 (74.5 %)	26 (76.5 %)	20 (76.9 %)	0.97
Antihistamine oral	27 (49.1 %)	17 (50.0 %)	13 (50.0 %)	1.00

**Table 2**Changes in SNOT-22 total and rhinologic sub-domain scores (mean  $\pm$  SD).

	Ablation (N = 34)			Neurectomy (N = 26)		
	Pre	Post	p-Value	Pre	Post	p-Value
Need to blow nose	2.7 $\pm$ 1.6 (N = 33)	2.7 $\pm$ 1.6 (N = 28)	0.96	3.3 $\pm$ 1.6 (N = 26)	2.7 $\pm$ 1.5 (N = 26)	0.14
Sneezing	1.5 $\pm$ 1.4 (N = 33)	2.3 $\pm$ 1.5 (N = 19)	0.04	1.8 $\pm$ 1.6 (N = 26)	1.4 $\pm$ 1.3 (N = 26)	0.34
Runny nose	3.1 $\pm$ 1.8 (N = 33)	2.9 $\pm$ 1.8 (N = 26)	0.73	3.4 $\pm$ 1.6 (N = 24)	2.4 $\pm$ 1.7 (N = 25)	0.04
Nasal obstruction	1.9 $\pm$ 1.5 (N = 31)	2.6 $\pm$ 1.1 (N = 18)	0.08	2.4 $\pm$ 1.8 (N = 25)	1.7 $\pm$ 1.8 (N = 24)	0.22
Loss of smell	1.2 $\pm$ 1.5 (N = 33)	2.5 $\pm$ 1.6 (N = 11)	0.01	0.5 $\pm$ 0.9 (N = 24)	0.4 $\pm$ 0.8 (N = 22)	0.59
Cough	2.1 $\pm$ 1.7 (N = 32)	2.7 $\pm$ 1.5 (N = 24)	0.14	1.9 $\pm$ 1.9 (N = 25)	1.6 $\pm$ 1.7 (N = 25)	0.58
Post-nasal discharge	3.6 $\pm$ 1.4 (N = 33)	3.4 $\pm$ 1.2 (N = 30)	0.59	4.0 $\pm$ 1.5 (N = 24)	2.9 $\pm$ 1.7 (N = 26)	0.03
Thick nasal discharge	2.2 $\pm$ 1.6 (N = 31)	3.0 $\pm$ 1.4 (N = 18)	0.08	2.7 $\pm$ 1.8 (N = 20)	2.5 $\pm$ 1.9 (N = 22)	0.73
Rhinologic subdomain	17.3 $\pm$ 6.2 (N = 34)	14.4 $\pm$ 8.9 (N = 34)	0.13	18.6 $\pm$ 5.5 (N = 26)	14.9 $\pm$ 5.9 (N = 26)	0.02
Total SNOT-22	35.3 $\pm$ 17.3 (N = 34)	30.4 $\pm$ 21.7 (N = 34)	0.31	43.3 $\pm$ 21.5 (N = 26)	33.3 $\pm$ 21.8 (N = 26)	0.10

# Result- Overall Symptom Improvement

- minimal clinically important difference (MCID) reduction
- 57.7% of the neurectomy group
- 47.1% in the ablation group

# Result- Specific Rhinologic Symptoms

- Runny nose and post-nasal discharge
- Sneezing
- Loss of Smell

# Sub-Analyses and Predictors of Success

- Secondary Procedures

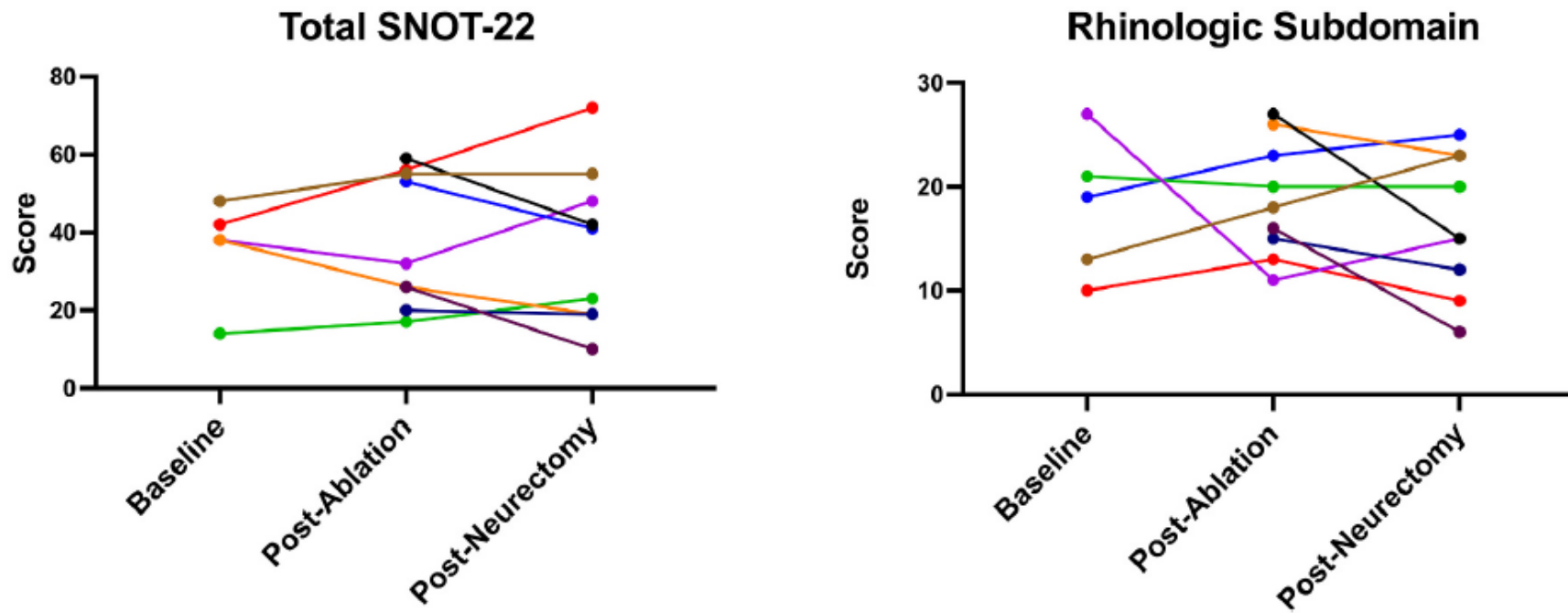


Fig. 2. Evolution of SNOT-22 scores in sub-cohort of patients receiving cryotherapy followed by PNN neurectomy.

**Table 3**

Odds ratios for multivariable logistic regression.

Parameter	Odds ratio [95 % confidence interval]
Age	0.99 [0.94–1.04]
Sex (male, female)	2.97 [0.56–15.78]
Allergic rhinitis status	0.47 [0.09–2.32]
Co-morbidities	
GERD	2.87 [0.70–11.73]
Asthma	1.30 [0.26–6.59]
History of smoking	2.30 [0.45–11.76]
Surgical history	
Turbinate reduction	1.27 [0.23–6.95]
Septoplasty	1.17 [0.19–7.14]
Sinus surgery	0.46 [0.05–3.92]
Medications	
Inhaled corticosteroid	1.80 [0.21–15.74]
Budesonide	0.74 [0.12–4.40]
Inhaled antihistamine	0.94 [0.20–4.44]
Oral antihistamine	0.96 [0.21–4.48]
Ipratropium	0.44 [0.04–5.28]

# Conclusions and Clinical Implications

- Equally Viable Options
- Tailored Treatment
- Patient Preference

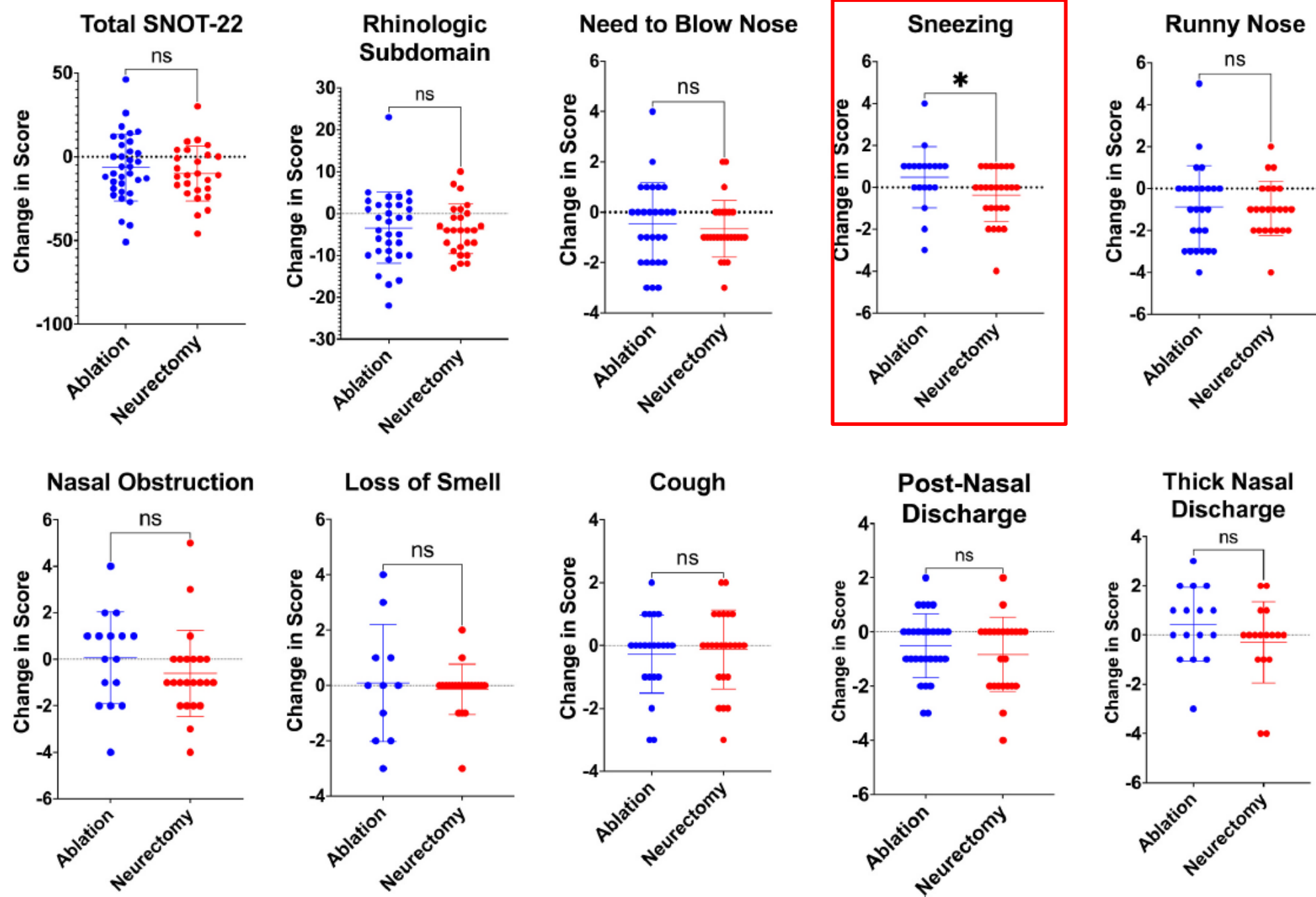





Fig. 1. Magnitude changes in SNOT-22 scores for office ablation and PNN neurectomy cohorts. ns = not significant, \* =  $p < 0.05$ .

# Comparative Effectiveness of Cryotherapy and Radiofrequency Ablation for Chronic Rhinitis: A Systematic Review and Meta-analysis

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**Table 2.** Comparison of TNSS score changes from baseline to postoperative follow-up time points between the cryotherapy and radiofrequency ablation groups

Group	Follow-up					Rate of good response <sup>a)</sup>	Rate of clinical response <sup>b)</sup>
	1 mo	3 mo	6 mo	12 mo	24 mo		
Cryotherapy	(n=5) MD, 3.5265; 95% CI, 3.3346–3.7185; I <sup>2</sup> =0.0%	(n=6) MD, 3.5026; 95% CI, 3.2989–3.7063; I <sup>2</sup> =0.0%	(n=2) MD, 3.5388; 95% CI, 2.7585–4.3191; I <sup>2</sup> =83.7%	(n=3) MD, 3.7584; 95% CI, 2.8071–4.7096; I <sup>2</sup> =85.6%	(n=1) MD, 4.1000; 95% CI, 3.3362–4.8638; I <sup>2</sup> =NA	(n=2) 73.7%; 95% CI, 0.6639–0.7998; I <sup>2</sup> =0.0%	(n=2) 81.8%; 95% CI, 0.7393–0.8772; I <sup>2</sup> =0.0%
Radiofrequency ablation	(n=2) MD, 4.2627; 95% CI, 2.9794–5.5460; I <sup>2</sup> =79.0%	(n=4) MD, 4.1399; 95% CI, 3.5476–4.7322; I <sup>2</sup> =67.3%	(n=3) MD, 4.8121; 95% CI, 4.4057–5.2185; I <sup>2</sup> =27.5%	(n=3) MD, 4.8740; 95% CI, 4.3979–5.3500; I <sup>2</sup> =0.0%	(n=1) MD, 5.5000; 95% CI, 4.6863–6.3137; I <sup>2</sup> =NA	(n=4) 76.9%; 95% CI, 0.6913–0.8311; I <sup>2</sup> =41.3%	(n=4) 91.9%; 95% CI, 0.8788–0.9465; I <sup>2</sup> =0.0%
<i>P</i> -value	0.266	0.046	0.005	0.040	0.014	0.536	0.005

TNSS, total nasal symptom score; MD, mean difference; CI, confidence interval; NA, not available.

<sup>a)</sup>>30% reduction in the total TNSS. <sup>b)</sup>≥minimal clinically important difference (1 point) in the total TNSS.

**Conclusion.** Rhinitis-associated subjective symptom scores and quality of life may be improved by both cryotherapy and radiofrequency ablation. Ablation was more efficacious than cryotherapy for nasal symptoms in patients with nonallergic rhinitis. To corroborate these findings, further randomized controlled studies directly comparing these two techniques are warranted.

# Take home message

1. Both in-office ablation and surgical neurectomy are effective treatments
2. Neurectomy has better outcomes in sneezing, runny nose, and post-nasal discharge
3. Secondary procedure has limited effect