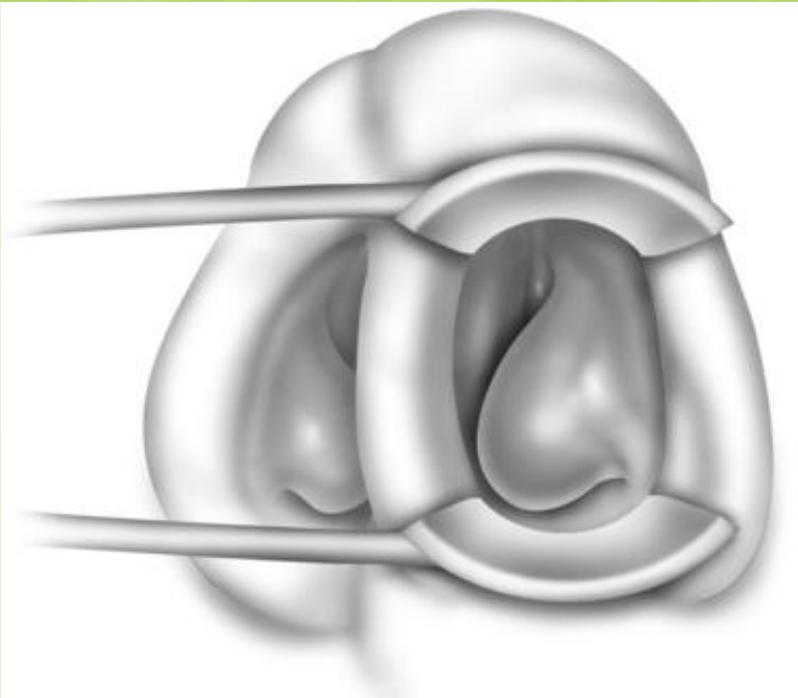




Thân thiện như chính ngôi nhà của bạn

# Pediatric Turbinates Hypertrophy

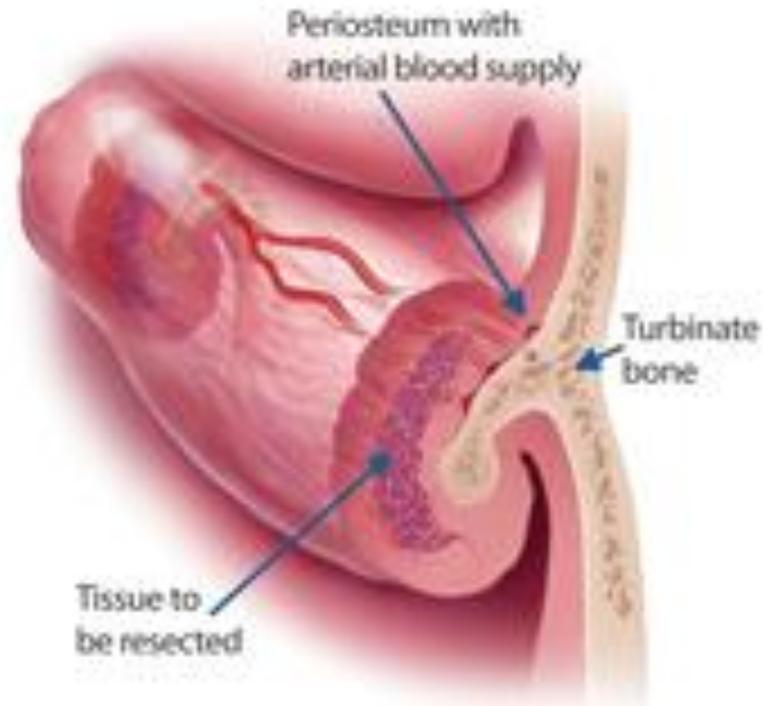
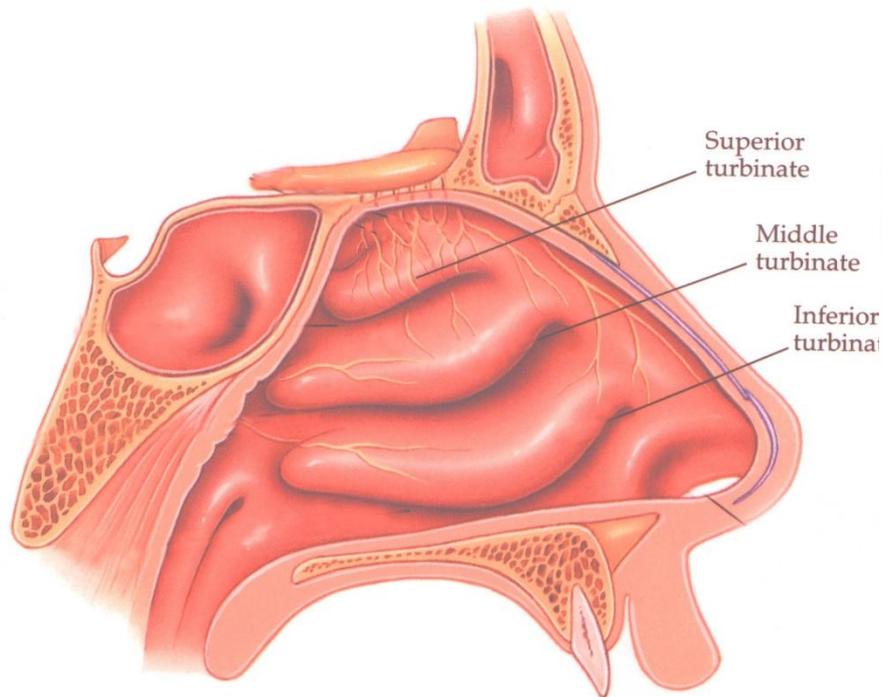
Huynh Thi My Hien. MD



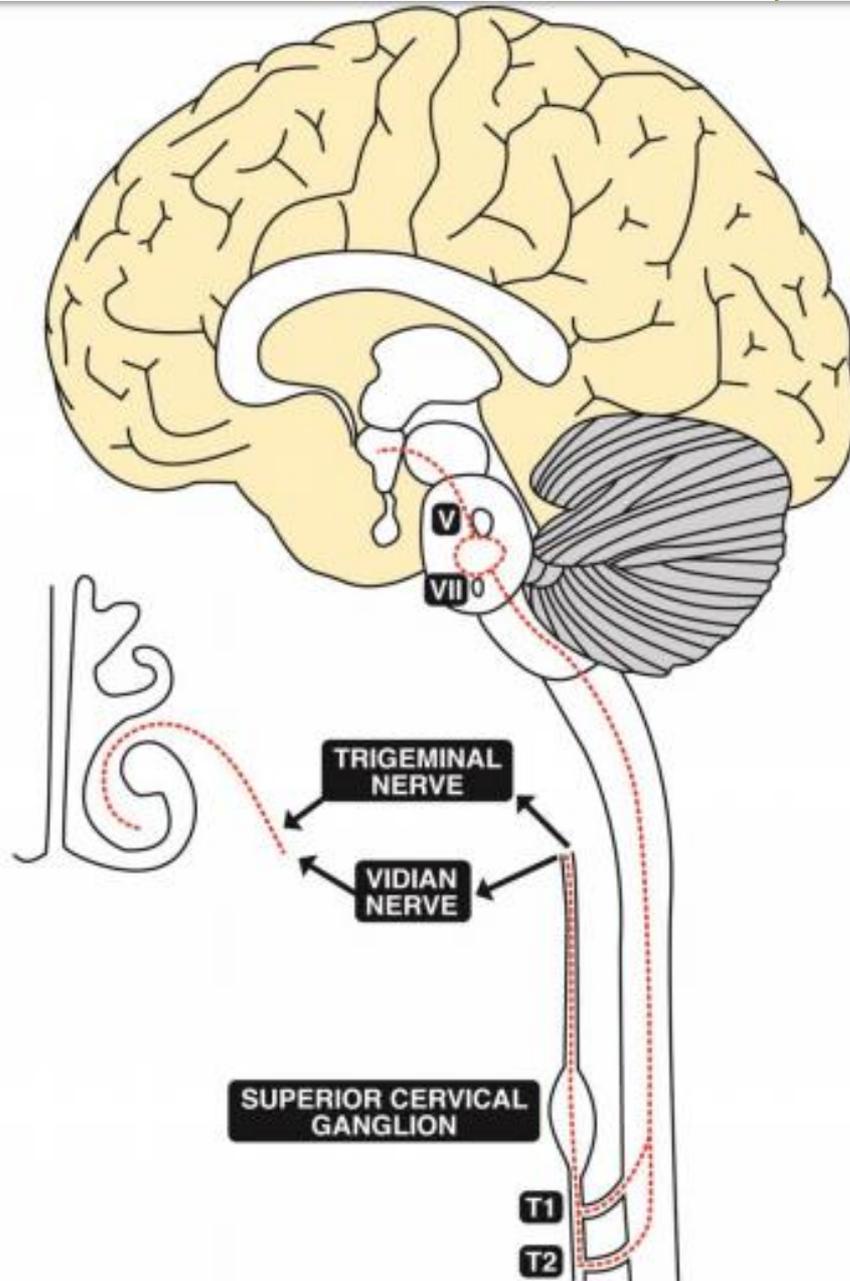
# Nasal obstruction

<b>(K) congenital</b>	<b>Infectious &amp; Idiopathic</b>	<b>Toxins &amp; Truma</b>	<b>Tumor ( Neoplasia)</b>
<ul style="list-style-type: none"> <li>• Neurogenic tumors.</li> <li>• Conginital Nasopharyngeal cysts.</li> <li>• Teratoma</li> <li>• Choanal atresia.</li> <li>• Nasoseptal deformaties</li> </ul>	<ul style="list-style-type: none"> <li>• Infectious Rhinitis</li> <li>• Rhinoscleroma</li> <li>• Chronic Sinusitis</li> <li>• Adenoid Hyperplasia</li> </ul>	<ul style="list-style-type: none"> <li>• Nasal &amp; septal Fractures</li> <li>• Medicatios side effects ( Rhinitis medimentosa)</li> <li>• Synechia</li> <li>• Environmental irritants</li> <li>• Septal Hematoma</li> <li>• Foreign bodies</li> </ul>	<ul style="list-style-type: none"> <li>• Papillomas</li> <li>• Nasal Polyps</li> <li>• Hemangiomas</li> <li>• Pyogenic granulomas</li> <li>• Juvenile nasopharyngeal angiofibromas</li> <li>• Malignancy</li> </ul>
<b>Endocrine</b>	<b>Neurologic</b>	<b>systemic</b>	
<ul style="list-style-type: none"> <li>• Diabetes</li> <li>• Hypothroidism</li> <li>• Pregnancy</li> </ul>	<ul style="list-style-type: none"> <li>• Vasomotor rhinitis</li> </ul>	<ul style="list-style-type: none"> <li>• Granulomatous diseases</li> <li>• Vasculitis</li> <li>• Allergy</li> <li>• Cystic fibrosis</li> </ul>	

# Turbinate Anatomy



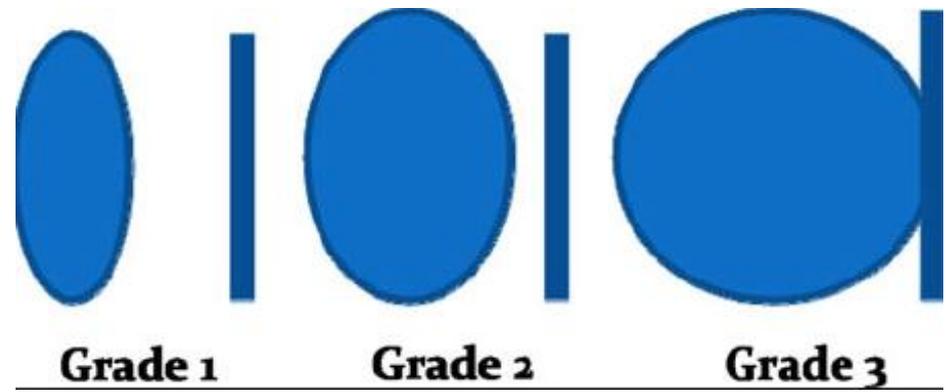
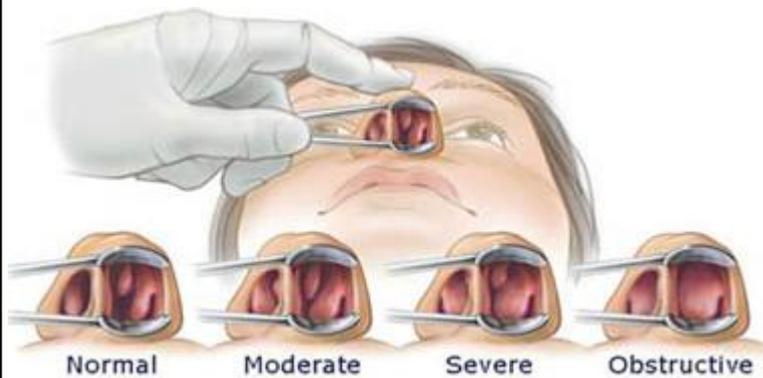
# Nasal cycle



- Cycles of swelling and constriction of the **venous sinuses** of the inferior turbinate and the nasal septum (Richard Kayser 1895)

## Friedman grading system of inferior turbinate hypertrophy

Grade	Definition
Grade I	The turbinate was defined as mild enlargement with no obvious obstruction
Grade II	The turbinate was in between grade I and grade III
Grade III	The turbinate completely occluded the nasal cavity



# Medical Management

- Antihistamines
- Decongestants
- Topical nasal steroids/nasal saline/sinus rinses
- Antibiotics if sinusitis
- Immunotherapy if allergic

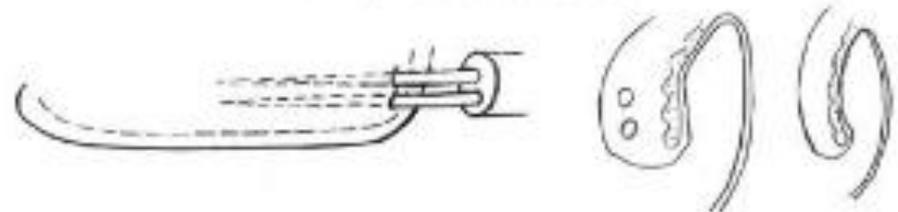
# Surgical Options

- Cold-steel turbinoplasty
- Lateralization/outfracture of inferior turbinate
- Diathermy (electrocautery)
- Laser
- Cryosurgery
- Microdebrider
- Radiofrequency Ablation
- Coblation

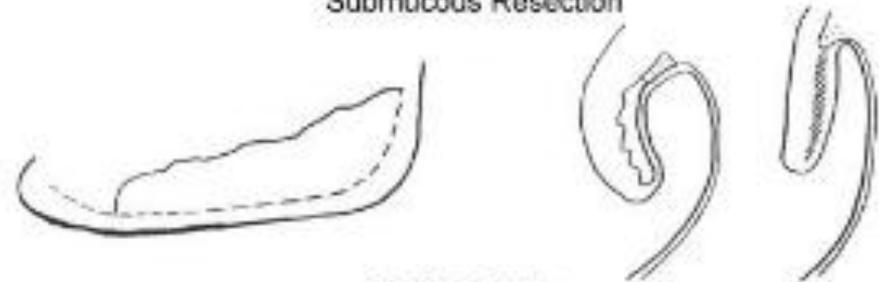
Lateral Outfracture



Intramural Cauterization



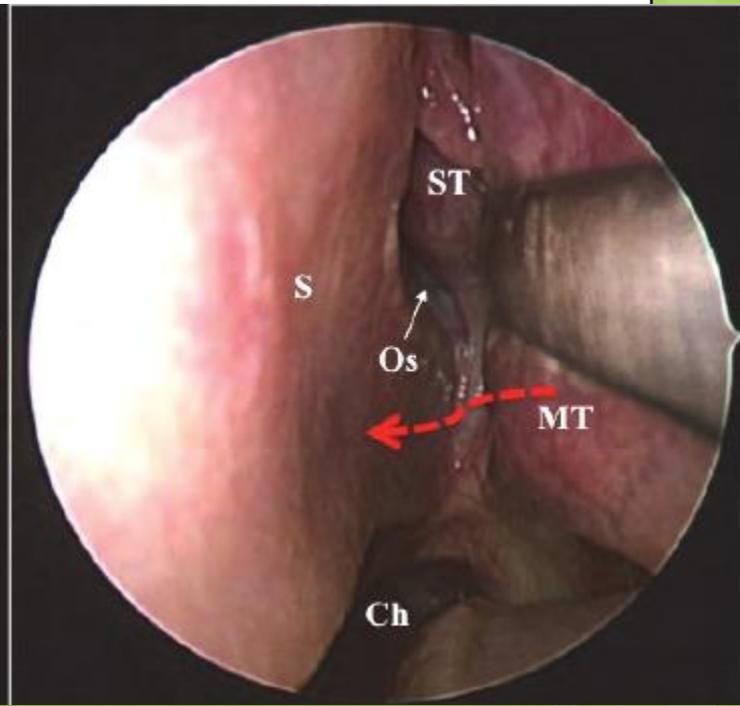
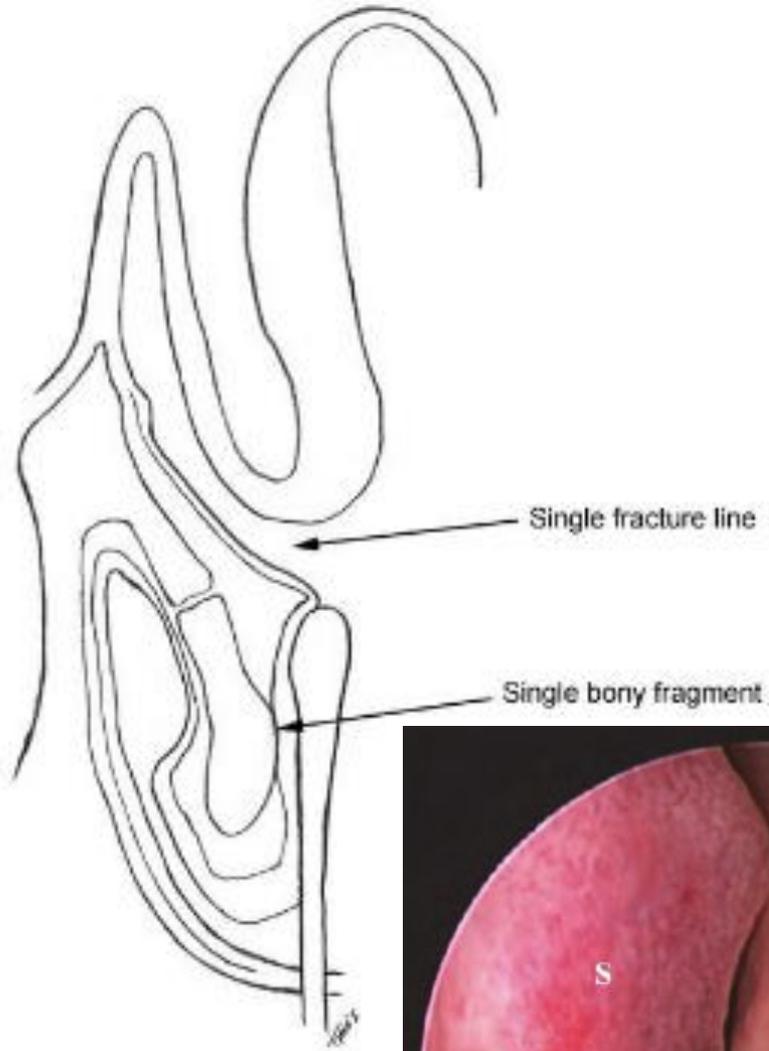
Submucous Resection



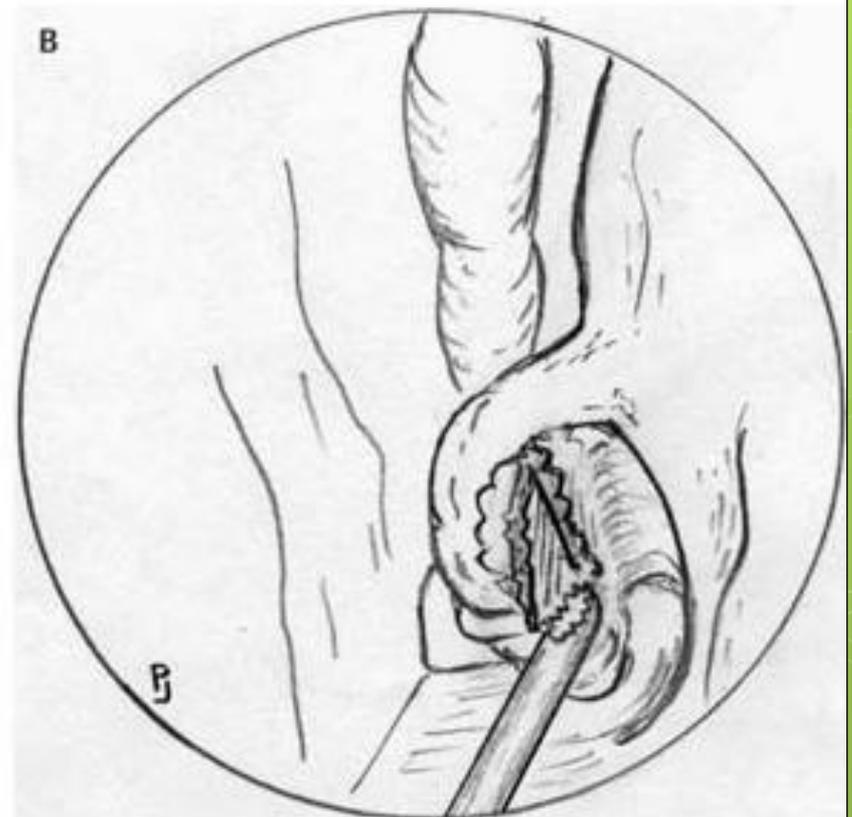
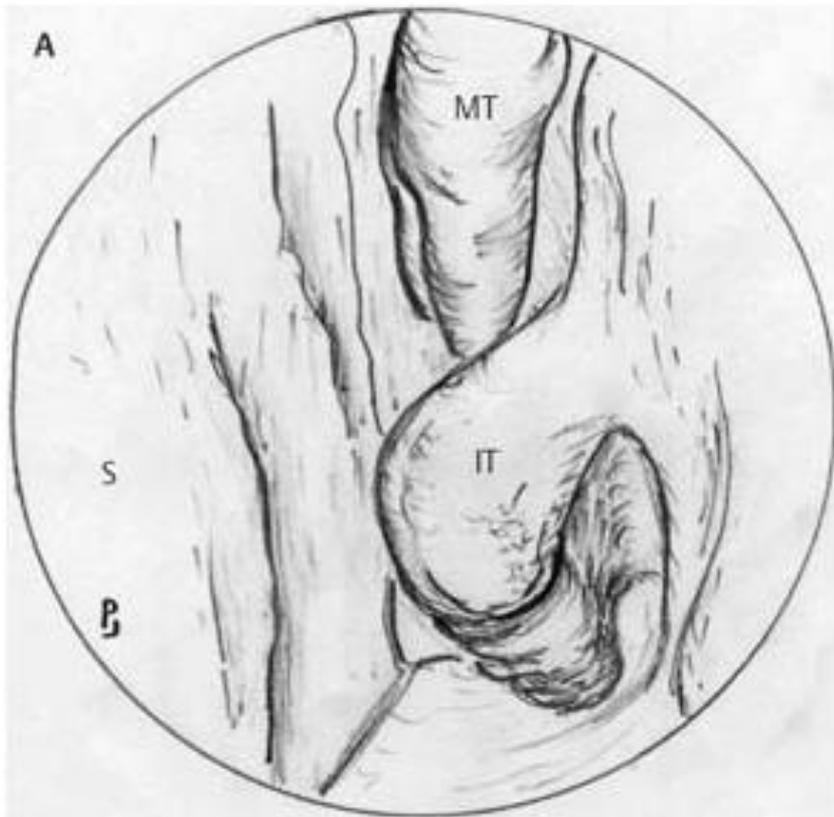
Turbinectomy



# Cold-steel



# Microdebrider



# Laser



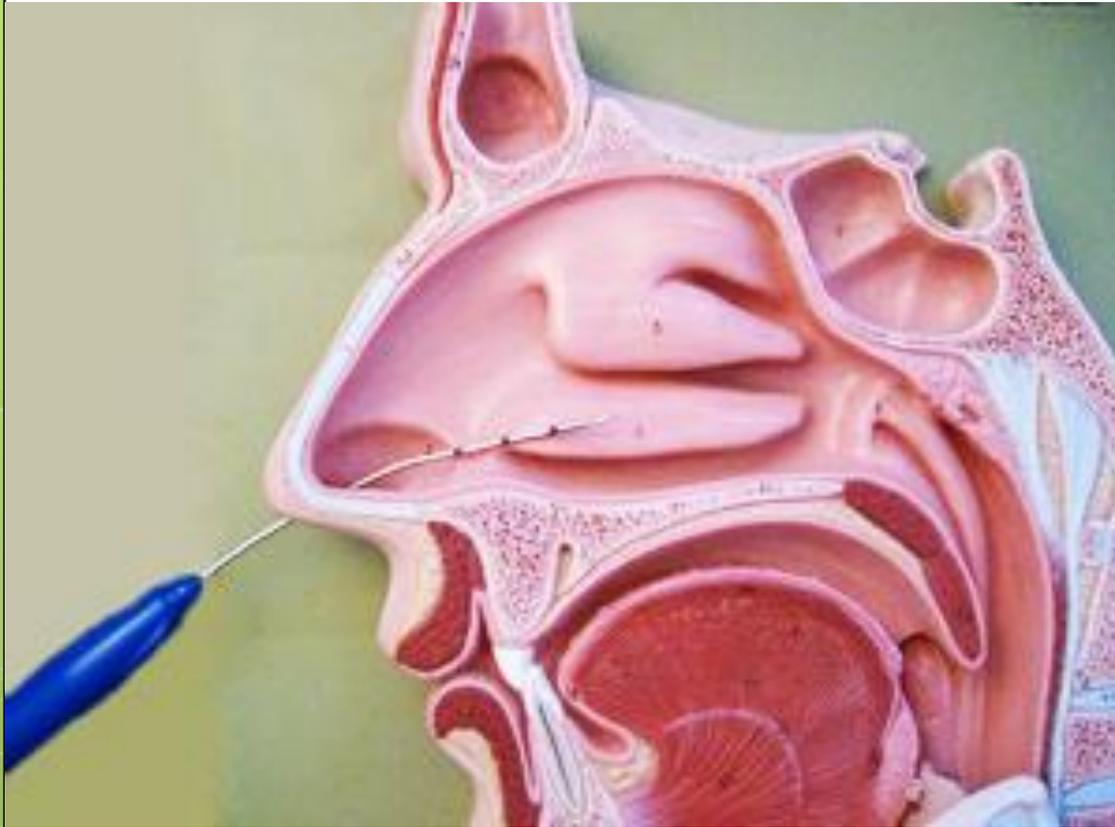
prior decongestion

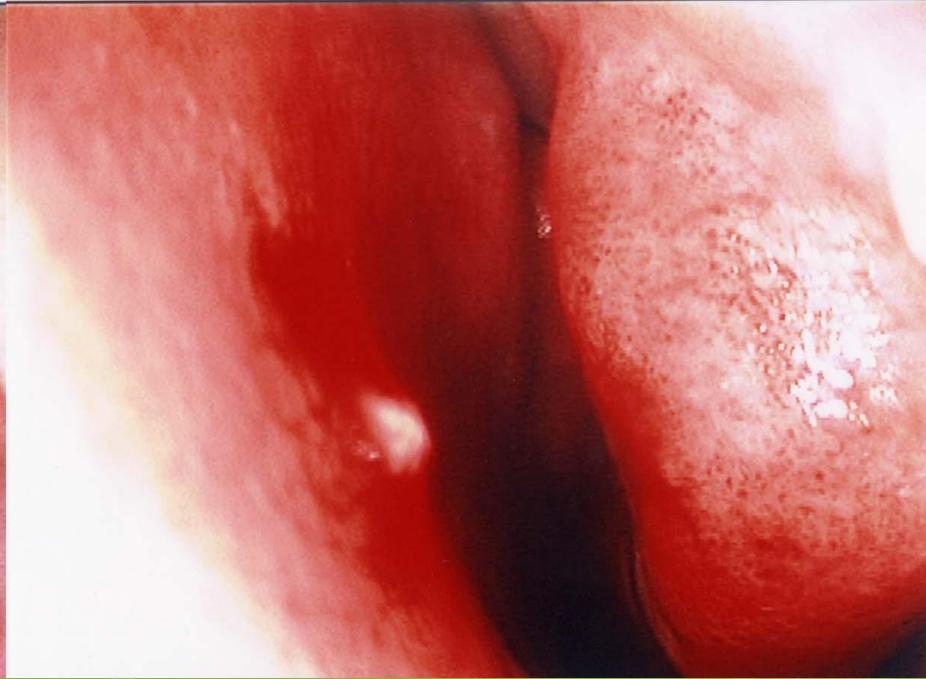
post irradiation  
(1940nm, 3W)

2months post OP  
prior decongestion

*J. Biomed. Opt.* 20(6), 061110 (Jun 16, 2015). doi:10.1117/1.JBO.20.6.061110

# Coblation





# Bipolar vs. Coblation

In a prospective, single-blinded study, Shah et al (2015):

- 41 patients: coblation in 1 nostril and intramural bipolar cautery in the other.
- Data: VAS, acoustic rhinometry, nasal endoscopy
- Coblation was significantly **less painful** than bipolar cautery ( $p = 0.03$ ) and produced **less crusting** at 3 weeks ( $p = 0.009$ ).
- Similar in nasal obstruction (by acoustic rhinometry )

# Coblation vs. Microdebrider

- 60 patients randomized/not blinded
- 30 coblation/30 microdebrider
- 3,6, 12 month follow-up
- Improvement at all time points in both groups
  - Nasal obstruction
  - Postnasal drip
- Symptoms of nasal obstruction and nasal cavity better in microdebrider group at 12 months

Lee JY, Lee JD. Laryngoscope 116:729-734, 2006.

# Radiofrequency vs. Submucous resection

- 75 patients
- Both techniques equally effective in short-term
- RF benefits:
  - Preserves nasal epithelium
  - No increased secretions or crusting
  - No nasal packing
  - Sooner return to work/activities; minimal pain
- May outweigh increased cost of RF wand

Cavaliere M, Mottola G, Iemma M. Otolaryngol Head Neck Surg 133(6): 972-978, 2005.

**Table 1:** Objective nasal symptoms compared before and after radiofrequency surgery in patients who were suffered from nasal inferior turbinate hypertrophy (Mean±SD).

Clinical signs	Before surgery	A week after surgery	A month after surgery	3 months after surgery	<i>P</i>
<b>Turbinate swelling and edema</b>	2.5±0.5	2.4±5	0.9±0.8	0.6±0.5	<0.0001
<b>Anterior and posterior nasal secretions</b>	1.8±0.8	1.7±7	1.1±0.6	0.6±0.4	<0.0001
	1±0.7	0.9±0.7	1±0.6	1±0.6	<0.0001



**Table 2:** Subjective nasal symptoms compared before and after radiofrequency surgery in patients who were suffered from nasal inferior turbinate hypertrophy (Mean±SD)

Clinical signs	Before surgery	A week after surgery	A month after surgery	3 months after surgery	<i>P</i>
Nasal obstruction	8.1± 1.5	8.00± 1.2	4.1± 1.3	1.5± 1.1	<0.0001
Snoring at night	6.8± 1	6.3± 1.3	3.4± 1	1.2± 1	<0.0001
Hyposmia	5.8± 1	6.1± 1.2	8.2± 1.3	1.2± 0.5	<0.0001
Sneeze	6± 1	5.5± 1.3	3.1± 1.4	1.6± 1	<0.0001
Itchy nose	4±1.5	3.5± 1.2	1.4± 1.3	1.4± 0.6	<0.0001
Headache	4± 1.2	4± 1	2.1± 1.2	1.3± 0.6	<0.0001

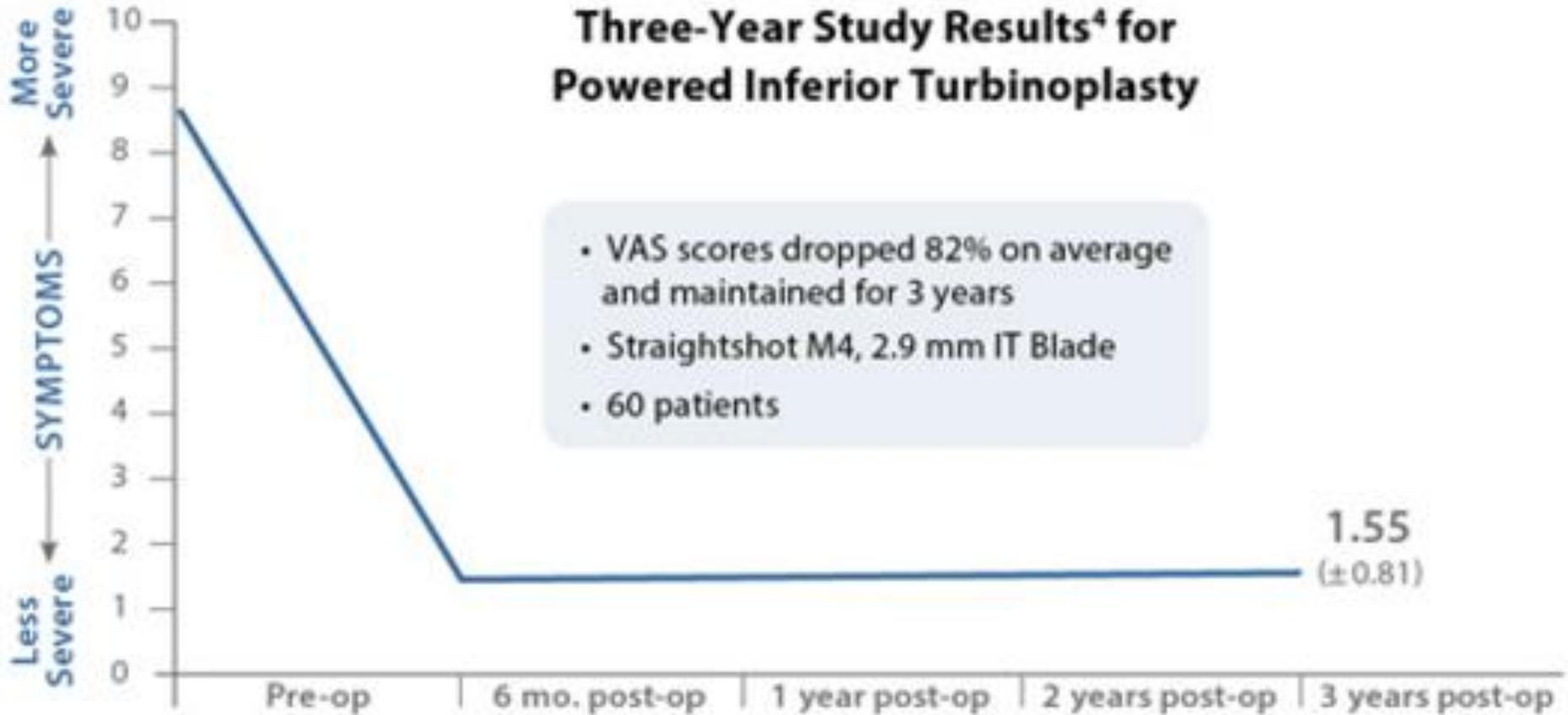
# Clinical Effectiveness of Coblation Inferior Turbinate Reduction

## CONCLUSIONS

- Inferior turbinate reduction by Coblation is effective for inferior turbinate hypertrophy
- Clinical benefit persists for at least 6 months

*Bhattacharyya N, Kepnes LJ. Otolaryngol Head Neck Surg. 2003;129:365-371.*

## Three-Year Study Results<sup>4</sup> for Powered Inferior Turbinoplasty



Chen Y-L, Tan C-T, Huang H-M. Long-term efficacy of microdebrider-assisted inferior turbinoplasty with lateralization for hypertrophic inferior turbinates in patients with perennial allergic rhinitis. *Laryngoscope*. 2008; 118:1270-1274.

**Table I - Age and sex distribution of the children in the study**

Age	Male	Female
6-12 years	7	4
> 12 years	4	5

Mean age = 11.25 years

**Table II - Results of postoperative follow up at one year.**

Complaints	Improved	Same	Worse
Nasal obstruction	18	02	
Rhinorrhea		03	
Hyposmia	03		

# Surgical Reduction of Inferior Turbinates with Coblation in Children: Multi-center Trial

- Prospective/Controlled Study (CHSD/MEEI/UCLA)
- Assess nasal obstructive symptom reduction in children following Coblation turbinate reduction (12 month follow-up)

# Pediatric Patient Selection

- Typically treat children **>6 years** that have failed trial of medical therapy
- Most children <3 years not yet truly diagnosed with *allergies*
- Young children have other sources of airway obstruction such as *adenoid hypertrophy*

# References

1. Pang YT, Willatt DJ. Laser reduction of inferior turbinates in children. Singapore Med J 1995; 36(5):514-516.
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3. Hol MK, Huizing EH. Treatment of inferior turbinate pathology: a review and critical evaluation of the different techniques. Rhinology 2000; 38(4):157-166.
4. Coste A, Yona L, Blumen M et al. Radiofrequency is a safe and effective treatment of turbinate hypertrophy. Laryngoscope 2001; 111(5):894-899.
5. Bäck LJ, Hytonen ML, Malmberg HO et al. Submucosal bipolar radiofrequency thermal ablation of inferior turbinates: a long-term follow-up with subjective and objective assessment. Laryngoscope 2002; 112(10):1806-1812.
6. Segal S, Eviatar E, Berenholz L et al. Inferior turbinectomy in children. Am J Rhinol 2003; 17(2):69-73.
7. Bhattacharyya N, Kepnes LJ. Clinical effectiveness of coblation inferior turbinate reduction. Otolaryngol Head Neck Surg 2003; 129(4):365-371.
8. Chang CW, Ries WR. Surgical treatment of the inferior turbinate: new techniques. Curr Opin Otolaryngol Head Neck Surg 2004; 12(1):53-57.
9. Rejali SD, Upile T, McLellan D et al. Inferior turbinate reduction in children using Holmium YAG laser-a clinical and histological study. Lasers Surg Med 2004; 34(4):310-314.

