



UNIVERSITA' CAMPUS BIO-MEDICO DI ROMA

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Rhinology and Otology

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**Campus Bio-Medico University of Rome
School of Medicine**

**Area of Otolaryngology
Chief: Prof. F. Salvinelli**



THE POTENTIAL ROLE OF HYALURONIC ACID IN POSTOPERATIVE RADIOFREQUENCY SURGERY FOR CHRONIC INFERIOR TURBINATE HYPERTROPHY

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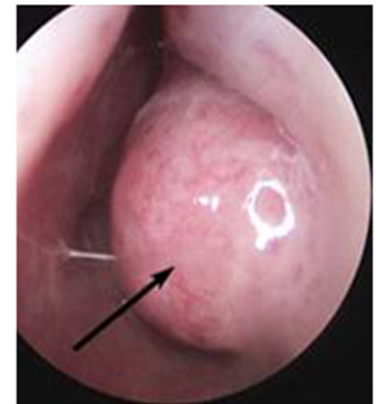
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EPIDEMIOLOGICAL DATA

“Turbinate dysfunction is universal. Every person experiences some degree of turbinate dysfunction at some point in his/her lifetime. Persistent dysfunction is not uncommon and involves approximately 50% of the population”.



INFERIOR TURBINATE HYPERTROPHY: PHARMACOLOGICAL TREATMENT

TOPICAL CORTICOSTEROID

ANTI-HIST

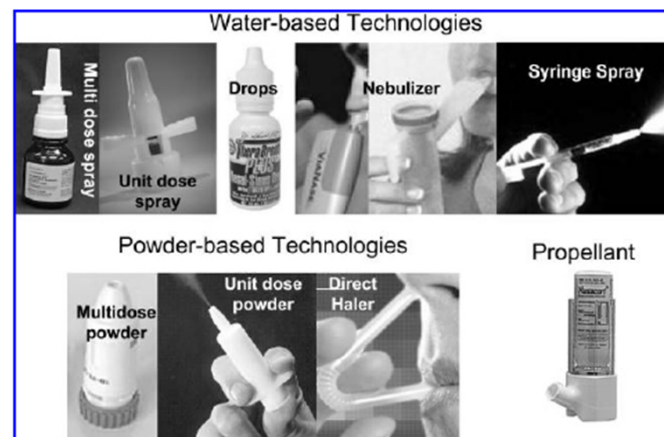
NASAL WASHING

TOPICAL VASOCONSTRICTOR

- SIDE EFFECTS

- LOW COMPLIANCE

- PARTIAL AND SHORT EFFECT





ANCIENT TURBINECTOMY

Duration: 20 min



Hospitalization: 2 dys

Tampons for 5 days



Rest: 7 days

Edema
crusts 30 days
Debris
Nasal congestion



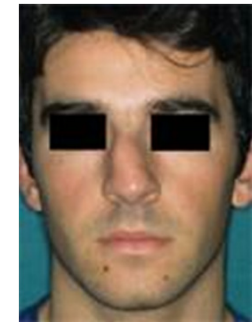
MINI-INVASIVE TURBINATE VOLUME REDUCTION TECHNIQUE

Duration: 10 min



Hospitalization: NO

Tampons for 5 days



No rest

Edema
crusts 30 days
Debris
Nasal congestion





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SURGICAL TREATMENT

Inferior turbinate surgery is one of the most frequent procedure in otolaryngology.

At least 13 mini-invasive different techniques have been introduced to reduce inferior turbinate volume

Lack of consensus on the optimal technique

MAIN SIDE EFFECTS: bleeding, crusting, foul odor, pain, hyposmia, synechia, bone necrosis and infection.

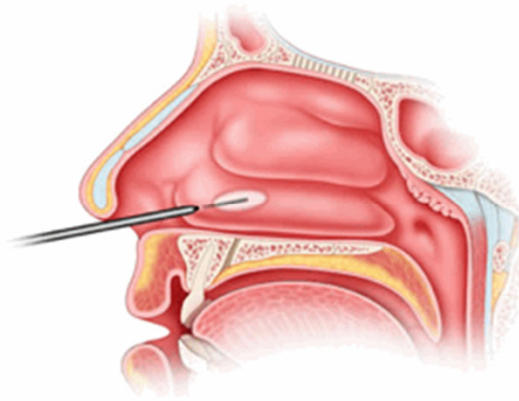
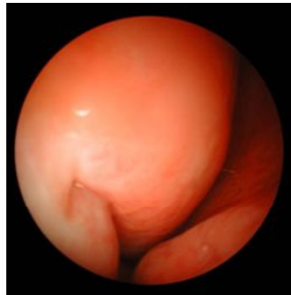
An ideal procedure for turbinate reduction should produce an improvement of nasal breathing with minimal discomfort or adverse reaction and should preserve the physiological function of the turbinates.



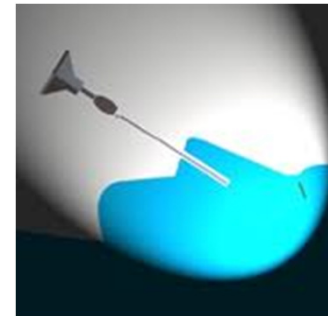
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RADIOFREQUENCY INFERIOR TURBINATE VOLUME REDUCTION

pre



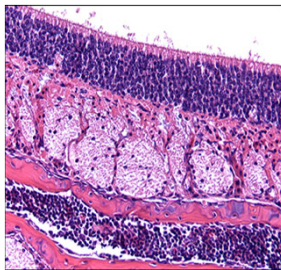
post



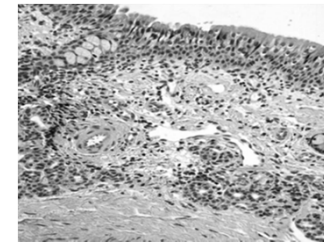
RADIOFREQUENCY TURBINATE SURGERY *RFVTR*:

This surgery can be done under surface anesthesia as an outpatient procedure, painless with no bleeding

pre



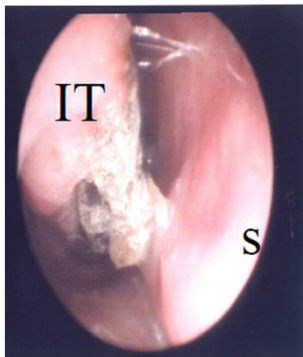
post



- Fibrous proliferation and scar formation in the superficial layer of the submucosa
- Obliteration of the submucosal small vessels
- Destruction of the submucosal glands.
-

the fibrin crust formations overlying the epithelium and the overall re-epithelization start 7 days after wounding and are usually completed within 8-10 weeks

Main discomfort for patients is in the first month after *RFVTR*



Several different solutions are usually used:

Isotonic

Hypertonic

Ocean water have been used for nasal lavage.

Oily balsamic solutions

A NEW TOOL FOR POST **RFVTR DISCOMFORT** : HYALURONIC ACID (HA)



HA is a natural nosulfated glycosaminoglycan with high molecule weight. It is a hygroscopic macromolecul and its solutions are highly osmotic

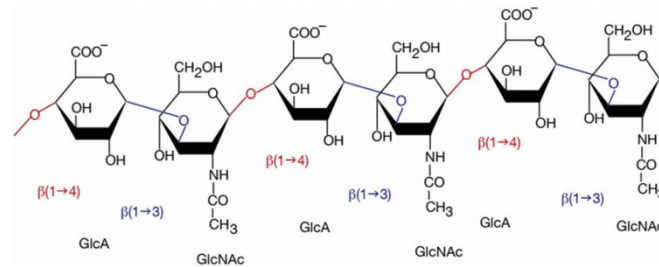
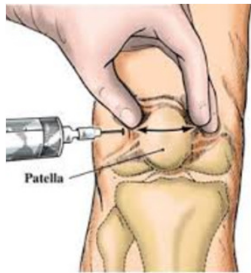
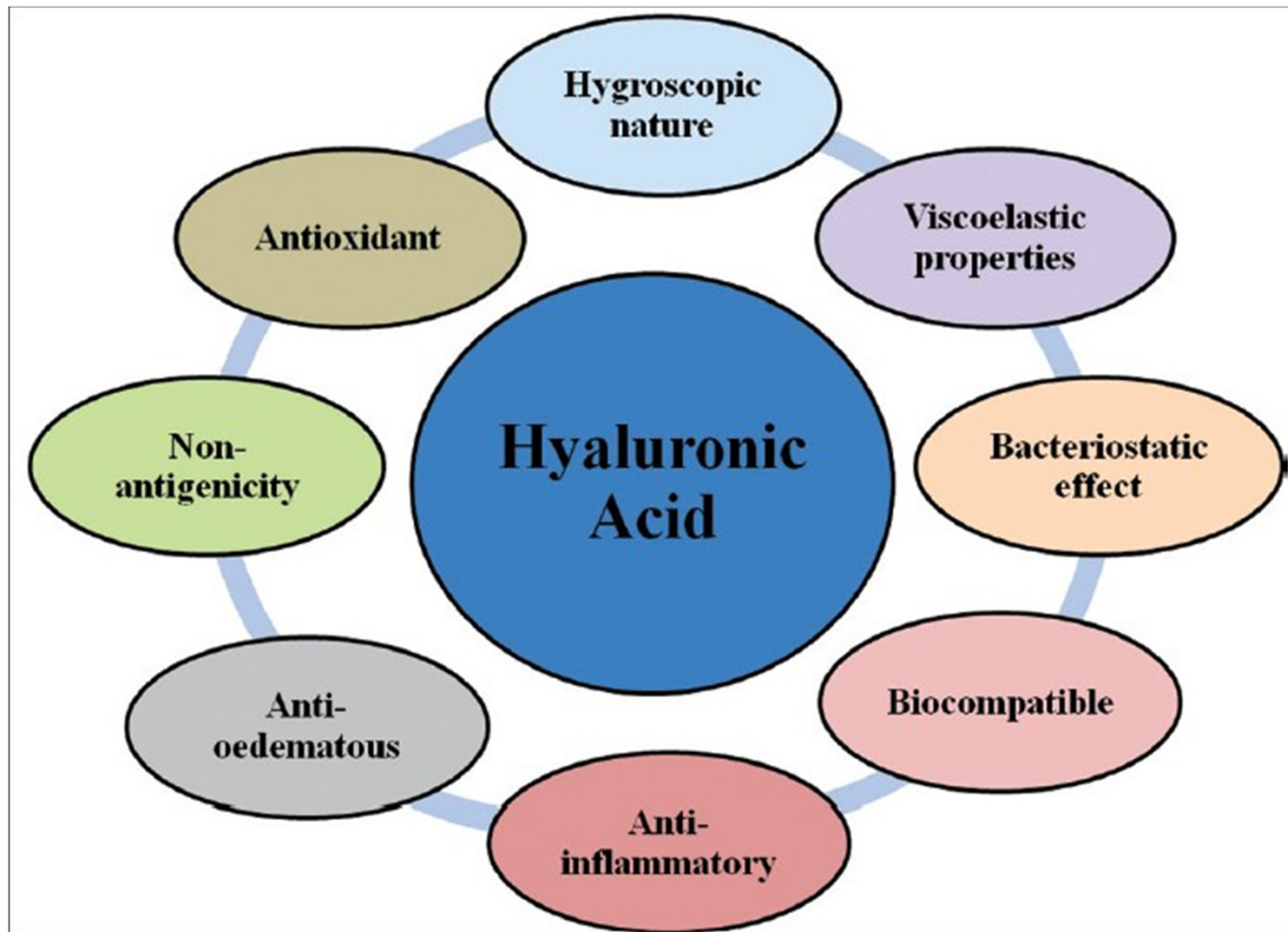


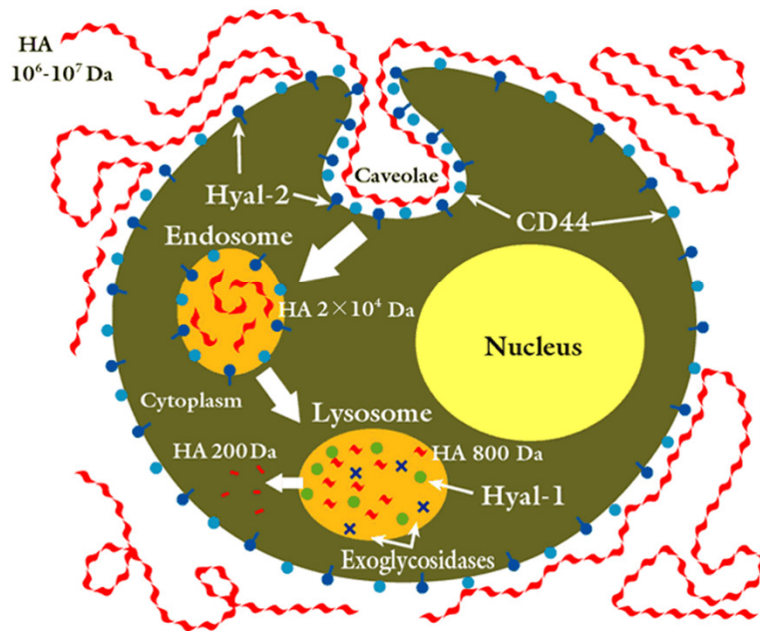
Figure 1. Hyaluronan structure
Hyaluronan is composed of repeating polymeric disaccharides D-glucuronic acid (GlcA) and N-acetyl-D-glucosamine (GlcNAc) linked by a glucuronic $\beta(1 \rightarrow 3)$ bond. Three disaccharide GlcA-GlcNAc are shown.

Today HA is widely used in many branches of medicine, especially in esthetic medicine, such as in the treatment of arthritis for its role into the inflammatory process.

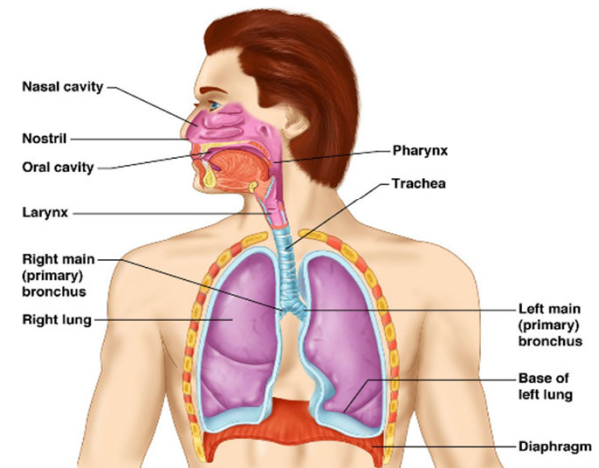
HA in upper respiratory tract



HA on respiratory surface



Tissue healing
 Promotion of cell proliferation, migration, and angiogenesis
 Stimulates ciliar motility
 Interference on bacterial adhesion;
 Interference on bacterial biofilm production

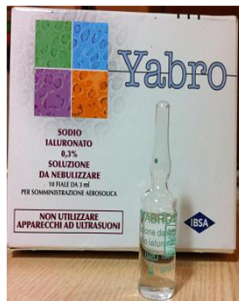




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AIM OF THE STUDY

To investigate the potential effect of the use of HA as adjuvant treatment to **HASTEN IMPROVEMENT** in nasal respiration and **TO MINIMIZE PATIENTS' DISCOMFORT** in the post-operative radiofrequency volumetric tissue reduction of inferior turbinates (RFVTR).



METHODS



**YABRO
Vs
Salin solution**



The **HA** group (22pts) who received HA (Yabro®) 1 fl 3 ml of HA is dissolved in 2 ml of isotonic solution twice a day through Rinowash for 14 days

80 consecutive adult patients with nasal obstruction resulting from inferior turbinate hypertrophy refractory to medical therapy (one month of topical corticosteroid) were prospectively enrolled:



The **Saline** group (35pts) who received normal saline nasal irrigation twice a day through Rinowash for 14 days



The study protocol was approved by the Research Ethics Committee at our institution and each patient signed a written informed consent



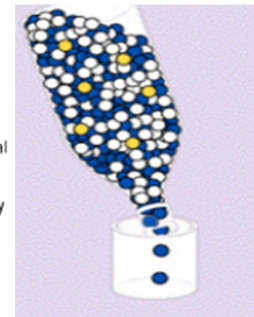
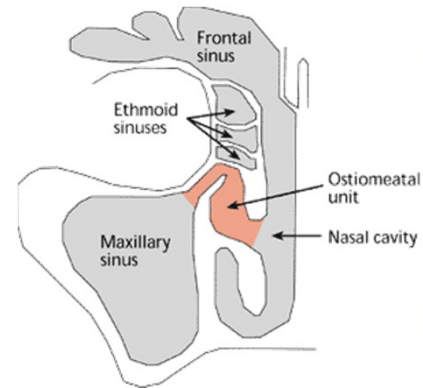
Delivery of the HA



Rinowash
Micronized nasal douche for the treatment of upper airways. It atomizes particles of an ideal size for treating the nasal cavities.



Nebula Spacer
Nebulizer with volumetric mouth mask. Increases efficacy of treatment. Improves bronchial disposition of the nebulized drug.





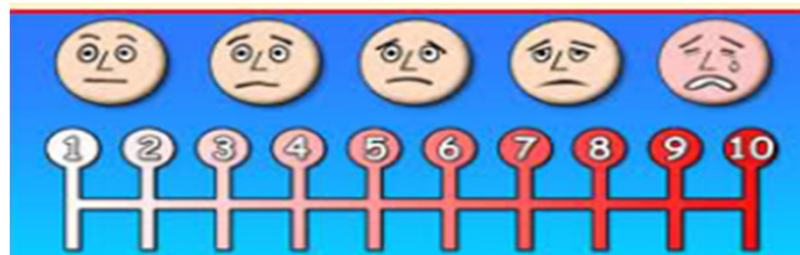
Methods

	HA group 22	Saline group 35
Mean age (range)	42 (19-73)	48 (22-78)
Male/female	14/8	11/13
Allergy test (% positive)	53,3	60,6

METHODS

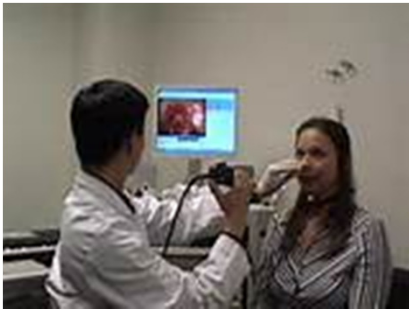
VISUAL ANALOGIC SCALE

nasal obstruction, sneezing, itchy nose, feeling of dryness, hyposmia, cacosmia, headache, nasal bleeding episodes, snoring, post-operative pain

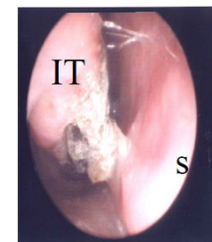


METHODS

Post-operative endoscopic 3-point scale SCORE



- crust formation
- mucosal swelling
- nasal secretions



All patients were evaluated postoperatively at the 1st, 2nd, and 4th week.



Results

	VAS HA group	VAS saline group	P value
1 st week	3,36 ± 1,89	6,95 ± 1,52	<u>P<0,05</u>
2 nd week	3,43 ± 1,27	5,75±1,39	<u>P<0,05</u>
4 th week	1,43±0,58	1,66±0,63	P= ns

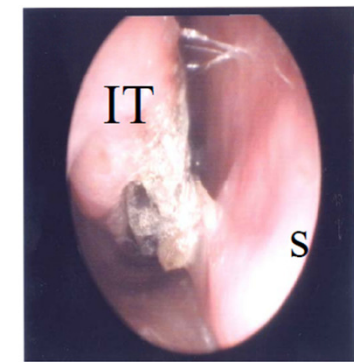
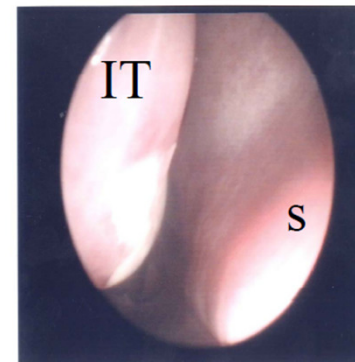
The HA patient can go back to normal daily activity a few days after surgery, with an enormous impact on social expense.

The aforementioned cost is well below the cost of two weeks HA treatment.



Results

	ENs HA group	ENs saline group	P value
1 st week	1,26	2,4	<u>P<0,05</u>
2 nd week	1,04	1,91	<u>P<0,05</u>
4 th week	0,20	0,12	P= ns





RESULTS

OTHER PARAMETERS

Good Compliance in the HA group even if it was lower than that of the saline group (76% vs 98%), probably due to the longer average time of administration and higher cost of HA (3.6 euro/die) compared to saline solution

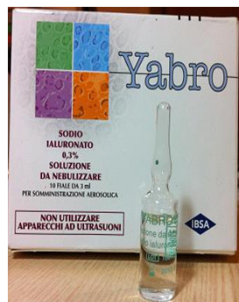
No side effects related to HA were recorded and irreversible sense of smell alterations were found in both group

Atraumatic cleaning of the nasal cavities by suction in HA group comparing to saline group is associated with less pain and bleeding from crust detachments.

Conclusions

- The earlier healing time improved in the HA group reflects the capacity of HA to favorably influence effects on tissue repair
- HA prevents crust formation, reduces mucosal swelling and nasal secretions, particularly in the first 2 postoperative weeks

HA could be considered a supportive treatment for a faster improvement of nasal respiration and minimizing patients' discomfort in the postoperative nasal surgery.



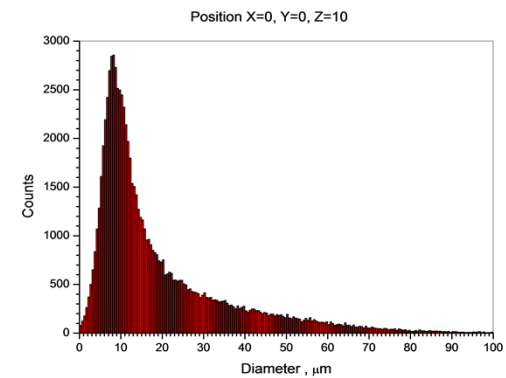
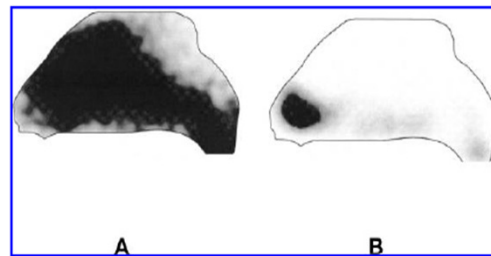


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DELIVERY SUBSTANCES IN NASAL AND PARANASAL CAVITIES

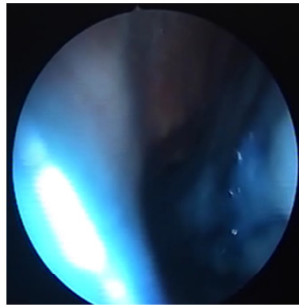
THE FUTURE: S.U.A.S.E. Spray-sol Upper Airway Specific Erogator

PCT/IB2014/065121

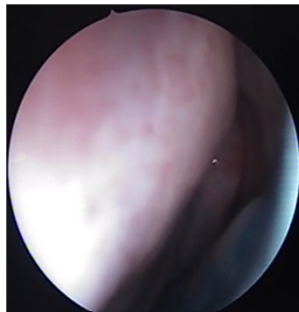
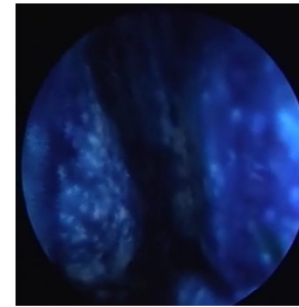




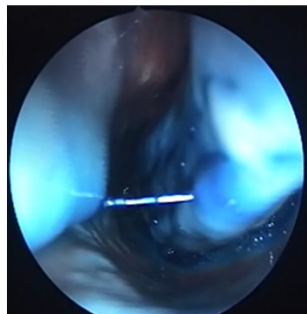
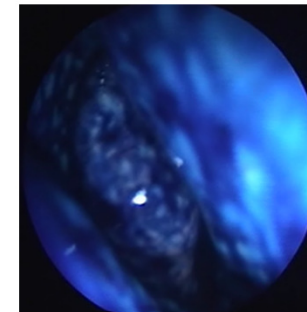
50 micron



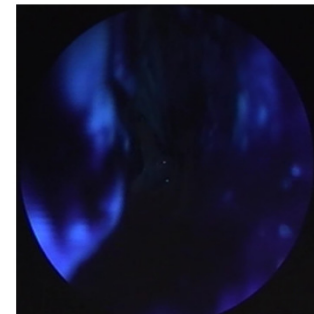
Overview



Middle turb



Inf turb



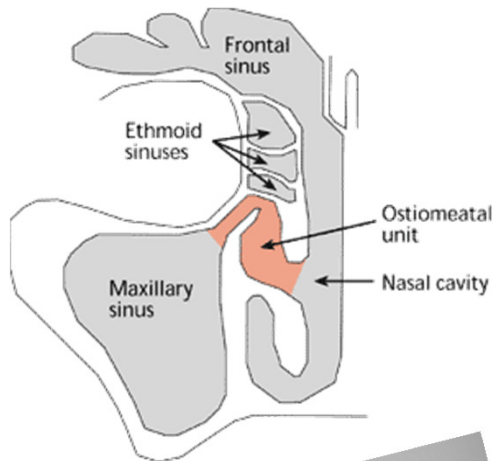


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THE FUTURE

S.U.A.S.E. **S**pray-**s**ol **U**pper **A**irway **S**pecific **E**rogator

Diameter=10-20 micron



SUASE nebulizes as Rinowash but:

Faster 5 cc in 8 sec

Higher compliance

Pocket

Low cost

Mono patient

No problems of sterilization

For any information about SUASE:
brio.suase@gmail.com



[Am J Rhinol Allergy](#). 2013 May-Jun;27(3):234-6. doi: 10.2500/ajra.2013.27.3869.

The potential role of hyaluronic acid in postoperative radiofrequency surgery for chronic inferior turbinate hypertrophy.

[Casale M](#), [Ciglia G](#), [Frari V](#), [Incammisa A](#), [Mazzola F](#), [Baptista P](#), [Mladina R](#), [Salvinelli F](#).

+ Author information

Erratum in

[Am J Rhinol Allergy](#). 2014 Jan-Feb;28(1):85. Manuele, Casale [corrected to Casale, Manuele]; Giacomo, Ciglia [corrected to Ciglia, Giacomo]; Valeria, Frari [corrected to Frari, Valeria]; Antonino, Incammisa [corrected to Incammisa, Antonino]; Francesco, Mazzola [corrected to Mazzola, Francesco]; Peter, Baptista [corrected to Baptista, Peter]; Ranko, Mladina [corrected to Mladina, Ranko]; Fabrizio, Salvinelli [corrected to Salvinelli, Fabrizio].

Abstract

BACKGROUND: We prospectively evaluated the efficacy of hyaluronic acid (HA) as an adjuvant treatment to hasten the improvement of nasal respiration and to minimize patients' discomfort in the postoperative radiofrequency volumetric tissue reduction (RFVTR) of inferior turbinates.

METHODS: We enrolled 57 patients randomly assigned into two groups, HA (22 patients) and saline group (35 patients), which received isotonic saline nasal irrigation. We used the monopolar device somnoplasty for all patients. Visual analogic scale (VAS) and nasal endoscopy were used to assess the outcomes of the treatments during the 1st month of follow-up.

RESULTS: The mean VAS score of the HA group at the 1st week was significantly lower than the control group (3.36 ± 1.89 versus 6.95 ± 1.52 ; $p < 0.05$). The VAS score remained significantly lower in the HA group also at the 2nd week (3.43 ± 1.27 versus 5.75 ± 1.39 ; $p < 0.05$), becoming similar to the control group at the 4th week ($p = ns$). Since the first visit the HA group also showed significantly lower crust score than the saline group ($p < 0.05$), and there was no crust found in either group at the last visit. The compliance to treatment was similar in both groups.

CONCLUSION: The results of this prospective study suggest a role of HA as a supportive treatment for faster improvement of nasal respiration, also minimizing patients' discomfort in postoperative nasal surgery, promoting nasal mucosa healing in postoperative RFVTR for inferior turbinate hypertrophy.



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Thank You



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