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

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“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
- ANTIHIST
- 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
Inferior turbinate surgery is one of the most frequent procedures 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.
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.

- 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 macromolecule and its solutions are highly osmotic.

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

- Hygroscopic nature
- Antioxidant
- Viscoelastic properties
- Bacteriostatic effect
- Non-antigenicity
- Anti-oedematous
- Biocompatible
- Anti-inflammatory
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
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).
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 **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

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
## Methods

<table>
<thead>
<tr>
<th></th>
<th>HA group 22</th>
<th>Saline group 35</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean age</strong></td>
<td>42 (19-73)</td>
<td>48 (22-78)</td>
</tr>
<tr>
<td><strong>Male/female</strong></td>
<td>14/8</td>
<td>11/13</td>
</tr>
<tr>
<td><strong>Allergy test (%) positive</strong></td>
<td>53.3</td>
<td>60.6</td>
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</tbody>
</table>
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

<table>
<thead>
<tr>
<th></th>
<th>VAS HA group</th>
<th>VAS saline group</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st week</td>
<td>3.36 ± 1.89</td>
<td>6.95 ± 1.52</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>2nd week</td>
<td>3.43 ± 1.27</td>
<td>5.75 ± 1.39</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>4th week</td>
<td>1.43 ± 0.58</td>
<td>1.66 ± 0.63</td>
<td>P= ns</td>
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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

<table>
<thead>
<tr>
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<th>ENs HA group</th>
<th>ENs saline group</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st week</td>
<td>1.26</td>
<td>2.4</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>2nd week</td>
<td>1.04</td>
<td>1.91</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>4th week</td>
<td>0.20</td>
<td>0.12</td>
<td>P= ns</td>
</tr>
</tbody>
</table>
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.
DELIVERY SUBSTANCES IN NASAL AND PARANASAL CAVITIES

THE FUTURE: S.U.A.S.E. Spray-sol Upper Airway Specific Erogator
PCT/IB2014/065121
Overview

Middle turb

Inf turb

50 micron
THE FUTURE

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

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


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 turbimates.

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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