Prediction of Success for Radiofrequency Ablation of the Inferior Turbinates

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Introduction: Inferior turbinate hypertrophy is a common cause of nasal obstruction, often associated with allergic rhinitis, nonallergic rhinitis and rhinosinusitis. Surgical treatment may come into play when medical treatment fails. The goal of surgery is to reduce the volume of the turbinates in order to improve nasal symptoms without disturbing nasal functions. Our objective for this study includes the presentation of our 6-month follow-up data of radiofrequency ablation of the inferior turbinates, and the analysis whether postoperative improvement through such surgery can be predicted by both subjective (VAS score) and objective measurements (rhinomanometry) preoperatively.

Methods: A prospective, non-randomized, unblinded clinical study was conducted with 53 patients: 23 male and 30 female (ranging from 18 to 65 years averaging at age 35.7). The subjective symptoms of nasal obstruction were measured by a standard 10 cm visual analog scale (VAS). The measurement was repeated 10 minutes after application of a topical nasal decongestant (0.1% xylometazoline hydrochloride nasal spray) in both nostrils. Subjective symptoms were evaluated at baseline and after 1, 3 and 6 months postoperatively. Nasal resistance was measured on each side by active anterior rhinomanometry (Rhinostream by Interacoustics, Assens/Denmark) at baseline and after 1, 3 and 6 months postoperatively. Radiofrequency ablation (CURIS® RF generator by Sutter Medizintechnik, Freiburg/Germany) was performed on all patients by the same surgeon (3rd author) in an outpatient procedure. One strip of cotton soaked with topical lidocaine 4% was applied to both nasal cavities for 10 minutes. Both turbinates were injected

Fig. 2: CURIS® RF unit (Sutter, Germany)

with 3 to 4 ml of lidocaine without any vasoconstrictor agent. The inferior turbinate probe was used to create 2 to 3 lesions (CURIS® adjustments: 10 watts, RaVoR mode, Autostop function, total energy ≤100 Joule). Patients were sent home and advised to use saline solution for 2 to 3 weeks. Nasal tamponades were not required.

Results: There was a significant decrease following radiofrequency surgery in both pre- decongestant and post-decongestant VAS scores postoperatively after 1, 3 and 6 months ($p<0.001$). There was no statistically significant change in these values between a 3-month compared to a 6-month follow-up. The mean (SD) improvement of nasal subjective symptoms 6 months after surgery was 53.14 % (16.13 %). There was a significant decrease in both pre-decongestant and post-decongestant resistance measurements following radiofrequency surgery after 1, 3 and 6 months postoperatively ($p<0.001$). There was no statistically significant change in these values between a 3-month compared to a 6-month follow-up. The mean (SD) improvement of nasal airflow determined by decreased nasal resistance after surgery was 38.91 % (17.75 %).

Discussion: In this study we have tried to identify whether a decongestant test may help with an estimate which patient will have a better outcome after RFA of the turbinates.

	VAS			Ant RMM (r)		
	Predecongestant	Postdecongestant	p	Predecongestant	Postdecongestant	p
Preoperative	7,26±0,90	4,09±0,88	0.001	0,77±0,29	0,40±0,10	0.001
Postoperative						
1 mo	4,21±1,27	3,13±0,89	0.001	0,55±0,24	0,36±0,11	0.001
3 mos	3,08±0,85	2,66±0,73	0.001	0,42±0,11	0,32±0,09	0.001
6 mos	3,36±1,19	2,64±0,83	0.001	0,45±0,16	0,32±0,09	0.001
p						
Preop vs 1 mo	0.001	0.001		0.001	0.001	
Preop vs 3 mos	0.001	0.001		0.001	0.001	
Preop vs 6 mos	0.001	0.001		0.001	0.001	
1 mo vs 3 mos	0.001	0.001		0.001	0.001	
3 mos vs 6 mos	ns	ns		ns	ns	

Fig. 1: Pre-decongestant and post-decongestant VAS and anterior rhinomanometry resistance (ant RMM (r)) values preoperatively and postoperatively.

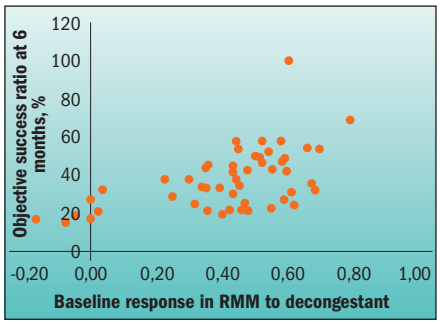

Fig. 3: There is a significant correlation between the 6th-month improvement in nasal resistance and the baseline response to the decongestant measured by rhinomanometry (p=0.000, r=0.53).

In our study, in addition to using subjective scoring, we evaluated our patients preoperatively with anterior rhinomanometry before and after decongestant application. Although there was a perfect correlation between preoperative and postoperative resistance measurements, this objective test was not able to predict the subjective outcome of the surgery. On the other hand, our preoperative objective test was able to predict the postoperative objective improvement in nasal functions to a great degree.

- Similar to the assessments in other reports, all of our patients in this study reported a significant reduction in subjective symptom scores and nasal airway resistance measurements following radiofrequency ablation of the inferior turbinates.
- A preoperative test that evaluates the subjective response to the decongestant can predict only a short-term postoperative improvement in subjective symptoms of the subjects.
- A preoperative test that evaluates the objective response to the decongestant by rhinomanometry can predict only a short-term subjective improvement in VAS.

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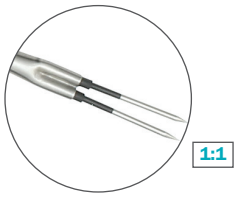
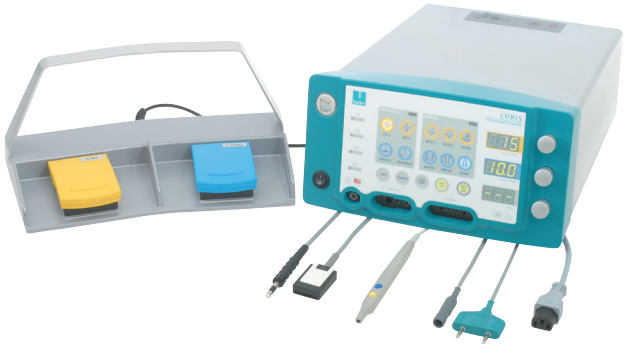
700462 – Bipolar needle electrode “Binner”

Qty.	REF	Description
1	700462	Bipolar needle electrode “Binner” with protective insulation, working length 110 mm





870010 – CURIS® basic set with single-use patient plates

Qty.	REF	Description
1	360100-01	CURIS® radiofrequency generator (incl. main cord, user manual and test protocol)
1	360110	Footswitch two pedals for CURIS® (cut & coag), 4 m cable
1	370154L	Bipolar cable for CURIS®, length 3 m
1	360704	Monopolar handpiece (pencil) cut & coag, shaft 2.4 mm, cable 3 m
1	360238	Cable for single use patient plates, length 3 m
1 (x50)	360222	Safety patient plates, single use, packing 5 x 10 pcs. (not shown)

Unit settings / Other accessories
CURIS® Bipolar electrode: Bipolar RaVoR, AUTOSTOP Power adjustment: 10 watts

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