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Volumetric Reduction of the Turbinates in 400 Patients Using a New Bipolar Radiofrequency Equipment

Epidemiological studies show a high incidence of the Obstructive Sleep Anpnea Syndrome (OSAS) in the general population. Snoring is a common symptom of OSAS and often serves as an "early warning signal". Frequently the reduction of free airflow through the nose is the "primum movens" of snoring and OSAS. This reduction increases the endoluminal negative pressure during inspiration, pulling together the flabby tissue of the throat and causing vibrations. One of the most frequent causes is hypertrophy of the inferior turbinates with or without septum deviation.

400 patients suffering from socially disruptive snoring and mild OSAS (apnea/hypopnea index (AHI) between 5 and 20 (avgerage 15.2)) were selected and divided into two groups (see tables 1 & 2).

	n	%
Male	297	74
Female	103	26
Total	400	100
Age	28 - 75	average 49

Table 1: Age and Sex of Patients

	n	%	AHI
Group 1 ("Snorers")	264	61	≤ 5
Group 2 (mild OSAS)	166	39	> 5 ≤ 20
Total	400	100	

Table 2: Grouping of Patients

For all the patients the main obstruction site was in the nose due to hypertrophy of the turbinates. Patients with several obstruction sites in the upper airway system or with a significant septum deviation were excluded. Before treatment polysomnography and rhinomanometry were performed (T0).

Active anterior rhinomanometric examination (RRM) was performed with the patient seated, in supine position and lying on both sides. Patients underwent Radiofrequency Volume Reduction (RaVoR™) with a new generator (Sutter RF Generator BM-780 II, fig. 1). For local anaesthesia a packing soaked in anaesthetic (lidocaine) was placed in the nose covering all of the inferior turbinate. No infiltration was made and no vasoconstrictor was used.

After four minutes the packing was removed and the "Binner" bipolar needle electrode was inserted (6 sec. at intensity level 2) in the submucosal tissue of the inferior turbinate head, body and, where needed, posterior part (fig. 2). None of the patients had bleedings or felt any pain during or after the procedure. Three months later rhinomanometry and polysomnography were repeated to evaluate the effectiveness of the treatment (T1).

Figure 1: Sutter RF generator BM-780 II

The central parameter when treating nasal obstruction, i.e. nasal flux, improved overall by 36%, a statistically significant change. The improvement of the rhinomanometric value did not depend on the patient's position in 62% of the patients while 38% experienced an improvement only when lying down. In group 2 the medium AHI sank from 15.2 to 7.3. Of the 166 patients treated 75 experienced a reduction to an AHI below 5. Rhinomanometry data improved in both groups. The success of the procedure was better in group 2. Furthermore, the improvement of nasal breathing by RaVoR™ treatment seems to result in a decrease of the time of snoring and of Epworth's test score.

RESULTS		T 0	T 1	
Nasal Flux average value	Group 1 & 2	122cc /sec	165cc /sec	P *< 0,01
Epworth's test score	Group 1	11	4	
	Group 2	15	6	
Time of snoring	Group 1	3,7 %	0,6 %	
	Group 2	7,3 %	1,1 %	
Medium AHI	Group 2	15,2	7,3	

Table 3: Results • P< 0,01 considered significant; T-Student test

The ideal radiofrequency treatment should minimize pain for the patient and have no or little side effects. It should also preserve the physiological functions of the turbinates such as regulation of air humidification, temperature and muco–ciliar transportation.

The system used operates inside the turbinates' tissue under the mucosa to avoid functional injuries and only causing volumetric reduction. The "Binner" probe we used is easy to employ. The procedure is performed under direct vision so that the physician can determine precisely where RF energy is applied in order to avoid undesired heat effects on the surrounding tissue. Thanks to the probe's thin needles and the short activation time as well as a low power setting the system produces only minimal lateral heat reducing the pain during and after the procedure.

Nasal obstruction caused by hypertrophy of the inferior turbinates could be a main cause of snoring and mild OSAS. RF treatment can achieve a decrease of nasal resistance and an increase of nasal airflow, thus considerably improving the symptoms and the patients' quality of life. The surgical results obtained with bipolar radiofrequency are good looking at both, the objective and subjective increase of the nasal flux.

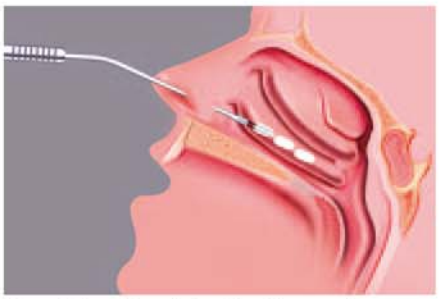

Figure 2: Insertion points of the Binner probe

A reduction of the snoring intensity and mild OSAS treatment were possible. RF treatment can be performed in a day-surgery and under local anaesthesia without postoperative use of nasal tampons. Moreover, the generator comes with autoclavable probes. Thus the costs per procedure are reasonable. This is very beneficial, especially since most commercially available RF systems only offer expensive single-use electrodes.

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More information on the RaVoR™ system:
www.sutter-med.com
www.ravor.de

References:

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