Endoscopic Bipolar Radiofrequencies And Lateralization For The Treatment Of Inferior Turbinates Hypertrophy

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Abstract

Objective: To evaluate the treatment of hypertrophy of inferior turbinates' with the combined use of endoscopic bipolar radiofrequencies with lateralization.

Design – Setting: Preliminary non randomized prospective uncontrolled clinical trial conducted in a secondary ENT clinic.

Participants - Methods: We present the management of 35 patients with hypertrophy of the inferior turbinates using bipolar radiofrequencies submucosally under endoscopic control, in combination with lateralization of the inferior turbinates bilaterally. All the procedures were performed under local anesthesia.

Main outcome - Measures: The complications were pain during the procedure in two patients (5.7%) and synechiae in three patients (9.6%). Thirty patients (93.75%) reported a significant improvement of their nasal patency at the end of the fourth month of the follow up based on five point scale. The 12-month follow-up revealed also good results in 26 patients (81.3%).

Results-Conclusion: Preliminary results indicate that endoscopic bipolar radiofrequencies and lateralization of inferior turbinates present an efficient outpatient option for the treatment of inferior turbinates hypertrophy. A randomized controlled study has been designed to compare this technique for the treatment of inferior turbinates hypertrophy with radiofrequencies application alone.

INTRODUCTION

One of the major causes of chronic nasal airway obstruction is the hypertrophy of the inferior turbinates. The causes of the hypertrophy can be allergic or non-allergic rhinitis. Usually the hypertrophy is due to the nasal mucosal and submucosal tissues and only rarely excessive bone hypertrophy is implicated.[1]

Several methods conservative and surgical have been applied to solve the problem. Partial or total turbinectomy, lateralization, turbinoplasty, laser application, cryotherapy, topical application of $AgNO_3$, injection of corticosteroids or sclerozing agents, vidian neurectomy, radiofrequencies (RF), powered instrumentation and bipolar or monopolar electrocautery are some of the methods which have been employed for the treatment of inferior turbinates hypertrophy.[2]

Despite the variety of the existing treatments, an optimal one is still missing. The present paper describes a method, which includes endoscopic RF application on 35 patients and their 12-month follow-up.

METHODS

From November 2003 through February 2005, 35 patients (19 males and 16 females) with chronic nasal obstruction due to inferior turbinate hypertrophy caused by non-allergic (22) and allergic rhinitis (13) were treated with ambulatory endoscopic bipolar submucosal RF application and inferior turbinates lateralization under local anesthesia.

This study was approved by the local ethics committee. The patients were 17 to 70 years old and written informed consent was obtained from all patients before inclusion in the study. The patients' diagnosis was chronic rhinitis and conservative treatment by local steroids and/or

antihistaminic medicaments did not yield good results any more. All patients suffered more than two years from nasal airway obstruction and 15 of them used nasal decongestive sprays excessively, suffering also from rhinitis medicamentosa, which contributed to their nasal obstruction.

A thorough history and a standardized questionnaire (regarding particularly nasal obstruction, rhinorrhea, and the reduction of the quality of life due to nasal symptoms) were obtained. Ten patients had undergone septoplasty in the past.

An ENT examination including a diagnostic rigid endoscopy of the nose was performed after decongestion and local anesthesia (using drops Pantocaine 0.5% and Xylometazoline nasal spray 1%). Surgical treatment was offered when the inferior turbinates size and the patient's complaints were improved after decongestion.

In all cases the operation was performed ambulatory under surface anesthesia. Three cotton rolls saturated with 5 ml of 2% Pantocaine solution as a maximum dose, were introduced in each nasal cavity so as to be in contact with the whole surface of the inferior turbinates bilaterally. No decongestant solution was used for proper action of the RF. The cottons were left in place between 15 and 20 minutes. After the removal of the cottons, a long Killian type speculum was introduced and lateralization of the lower turbinates was performed under endoscopic control (rigid endoscope Explorent Germany, 19,5cm long - 2,7mm diameter- 30&3176;). Then, a bipolar radiofrequency ablation needle of 1.3mm diameter (Celon Pro Breath, Celon AG Medical instruments) controlled by a bipolar power unit (Celon Lab ENT, Celon AG Medical Instruments, Teltow Germany) was inserted submucosally starting from the middle to the tail of the lower turbinate in one nasal cavity. The applicator was activated by means of pedal switch (three times while withdrawing the needle from posteriorly to anteriorly). Afterwards the needle was inserted from the head of turbinate to the previous point of insertion and three more “shots” were given. At all time the procedure was under endoscopic control. The other turbinate was treated with the same way afterwards. All operations were performed employing a power setting of 12W. At the end of the procedure no type of packing or dressing was inserted.

Postoperatively normal saline and mometasone nasal spray were used for 30 days. Seven to 12 days postoperatively, an endoscopically guided cleaning from crusts under local anesthesia and decongestion was carried out.

Follow-up was scheduled on the 4^{th}-6^{th} week, the 4^{th} and the 12^{th} month postoperatively. The lack of objective access of the nasal patency, using rhinomanometry or acoustic rhinometry, led us to evaluate the postoperative results using the five point scale questionnaires.

For the purposes of statistical analysis, the Wilcoxon signed rank test for mean difference was used (Statistical Package for the Social Sciences SPSS 13).

RESULTS

Three parameters were evaluated using five point scale questionnaires preoperatively, and on the 4^{th} and 12^{th} month postoperatively:

Obstruction (1=no obstruction, 2=mild, 3=moderate, 4=severe, 5=total)

Rhinorrhea (1=no rhinorrhea, 2=mild, 3=moderate, 4=severe, 5=intolerable)

Reduction of the quality of life due to nasal symptoms (1=no reduction, 2=mild, 3=moderate, 4=severe, 5=intolerable)

Three out of 35 patients were lost from follow-up and were not included in the study except for their pain sensation. All the remaining 32 patients were examined and gave answers using five point scale questionnaires. There was significant improvement of the obstruction feeling after 4 and 12 months postoperatively ($p<0.001$) [Table 1], whereas both rhinorrhea [Table 2] and the reduction of quality of life were less at the same time ($p<0.001$) [Table 3]. No statistical significant difference was found between 4 months and 12 months postoperative follow-up period regarding obstruction, rhinorrhea and reduction of quality of life. [Tables 1, 2 and 3]

From the 35 patients only 2 (5.7%) mentioned severe pain (five point scale 1=no pain, 2=mild, 3=moderate, 4=severe, 5=intolerable), while 33 (94.3%) mentioned no pain (24) or mild pain (9) during the operation [Table 4].

During the follow up period, the patients reported no complaints regarding bleeding, pain, dryness or crusting. No case of significant bleeding or infection was noted postoperatively. Three cases of mild sinechiae (9.6%) were noticed, and were treated by $C0_2$ laser application at a later time.

Figure 1

Table 1: Statistical analysis of nasal obstruction reported by the patients, preoperatively, 4 and 12 months postoperatively

	Mean	Std. Deviation
OBSTRUCTION PREOPERATIVELY	3,78	,553
OBSTRUCTION 4 MONTHS POSTOPERATIVELY	1,69	,780
OBSTRUCTION 12 MONTHS POSTOPERATIVELY	1,50	,672

Test Statistics (Wicoxon Signed Ranks Test)

Figure 2

	OBSTRUCTION 4 MONTHS POSTOPERATIVELY - OBSTRUCTION PREOPERATIVELY	OBSTRUCTION 12 MONTHS POSTOPERATIVELY - OBSTRUCTION PREOPERATIVELY	OBSTRUCTION 12 MONTHS POSTOPERATIVELY - OBSTRUCTION 4 MONTHS POSTOPERATIVELY
Asymp. Sig. (2-tailed)	,000	,000	,134

Figure 3

Table 2: Statistical analysis of nasal rhinorrhea reported by the patients, preoperatively, 4 and 12 months postoperatively

	Mean	Std. Deviation
RHINORRHEA PREOPERATIVELY	1,91	,689
RHINORRHEA 4 MONTHS POSTOPERATIVELY	1,44	,504
RHINORRHEA 12 MONTHS POSTOPERATIVELY	1,28	,457

Test Statistics (Wilcoxon Signed Ranks Test)

Figure 4

	RHINORHEA 4 MONTHS POSTOPERATIVELY - RHINORHEA PREOPERATIVELY	RHINORHEA 12 MONTHS POSTOPERATIVELY - RHINORHEA PREOPERATIVELY	RHINORHEA 12 MONTHS POSTOPERATIVELY - RHINORHEA 4 MONTHS POSTOPERATIVELY
Asymp. Sig. (2-tailed)	,003	,000	,132

Figure 5

Table 3: Statistical analysis of the quality of life reduction as reported by the patients, preoperatively, 4 and 12 months postoperatively

	Mean	Std. Deviation
QUALITY OF LIFE REDUCTION PREOPERATIVELY	2,56	,801
QUALITY OF LIFE REDUCTION 4 MONTHS POSTOPERATIVELY	1,44	,504
QUALITY OF LIFE REDUCTION 12 MONTHS POSTOPERATIVELY	1,31	,471

Test Statistics (Wilcoxon Signed Ranks Test)

Figure 6

	QUALITY OF LIFE REDUCTION 4 MONTHS POSTOPERATIVELY - QUALITY OF LIFE REDUCTION PREOPERATIVELY	QUALITY OF LIFE REDUCTION 12 MONTHS POSTOPERATIVELY - QUALITY OF LIFE REDUCTION PREOPERATIVELY	QUALITY OF LIFE REDUCTION 12 MONTHS POSTOPERATIVELY - QUALITY OF LIFE REDUCTION 4 MONTHS POSTOPERATIVELY
Asymp. Sig. (2-tailed)	,000	,000	,157

Figure 7

Table 4: Pain During Operation

	Frequency	Percent
NO	24	68,6
MILD	9	25,7
SEVERE	2	5,7
Total	35	100,0

DISCUSSION

The gold standard for the treatment of the inferior turbinates hypertrophy is still missing. Several techniques have severe side effects in short and long term including bleeding, atrophic rhinitis, nasal dryness, crusting, pain and blindness while others do not seem to be effective.[2,4,5,6]

A wider nasal cavity does not necessarily mean that the nose function will be better.[2,7] Thus, catastrophic techniques with no respect to nasal functionality, like total turbinectomy, are contemned by many authors.[2,8]

Many treatment methods have been reported with various

results.[2,9,10,11,12] Lateralization of the inferior turbinates is a simple procedure and entails no particular risks or complications.[2] On the other hand, it does not seem to be very effective. Since its effect is limited, it may be used as a complementary procedure.[2,8]

In our study we found that lateralization was useful as we could create more space, and thus the insertion of endoscope simultaneously with the ablation needle was become feasible.

Several studies report that treatment of inferior turbinate hypertrophy using bipolar RF offers an efficient alternative to other established methods.[13]

By presenting our work we provide preliminary results (based on five point scale questionnaires) of the treatment of turbinates hypertrophy with combination of bipolar RF and lateralization, under surface anaesthesia and with endoscopic guidance.

Advantages of this method comprise safety and convenience. It is an outpatient method with very few minor complications and without need for packing. In addition its cost is rather reasonable in comparison with laser treatment, while its effectiveness regarding nasal obstruction, rhinorrhea and improving the quality of life is very promising. Moreover with this technique, the mulberry type tails of the inferior turbinates are well amenable to treatment. Pain rarely was a real problem and the short term results were well comparable with others more sophisticated methods.

Based on these results a prospective randomized controlled study has been designed where endoscopic bipolar radiofrequencies and lateralization for the treatment of inferior turbinates hypertrophy are being compared to radiofrequencies application alone.

In conclusion, according to these preliminary results, treatment of inferior turbinates hypertrophy, using bipolar RF accompanied with inferior turbinates lateralization under endoscopic control, offers an efficient, outpatient and with very rare minor complications, alternative therapeutic option.

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