ORIGINAL ARTICLE

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Radio Frequency for the Management of Allergic Rhinitis Not Responsive to Medical Therapy In Gaza Strip- Palestine.

Abstract

The ideal treatment for allergic rhinitis unresponsive to medical therapy is still lacking. The aim of study is to evaluate the efficacy of turbinate surgery with radio frequency for treatment of allergic rhinitis unresponsive to medical therapy. Twenty patients treated and followed up for two periods, 6 months and 12 months. **Results:** None of the 20 patients had obvious discomfort, no adverse reactions including bleeding, infection, adhesion, nor a worsening of allergic symptoms. Nasal discharge was improved after 6 months among 14 (70%) (p value 0.03) of cases and dropped to 11 (55%) (p value not significant) after 12 months. After 6 months nasal obstruction was improved among 17 (85%) (p value 0.001) cases and dropped to 16 (80%) p value 0.0016) after 12 months. Other symptoms including nasal itching, sneezing, snoring, headache, eye itching as well anosmia showed dramatic improvement. **Conclusion**: Radiofrequency appears to be an effective and safe tool for treating allergic rhinitis not responding to medical therapy. In the future, radiofrequency has the potential to be one of the most popular surgical modalities and helps treatment of allergic rhinitis.

Introduction:

More than 1.5 billion people on earth suffer from some type of chronic rhinitis and nasal obstruction, frequent symptoms of perennial (year-round) allergic rhinitis and seasonal rhinitis (i.e. hay fever)[(1)]. Estimates of the number of Americans who suffer from allergic rhinitis vary from 14 million to 26 million. Individuals suffering from allergic rhinitis account for more than $4 billion in healthcare costs in the United States each year[(6)] Allergic rhinitis is an IgE mediated reaction of the mucous membrane of the nose, the reaction begins with cross linking of antigens to IgE molecules on the surface of a mast cell, releasing mediators (histamine, prostaglandin) and these mediators lead to a variety of symptoms including sneezing, nasal obstruction, rhino rhea, itching of the eyes, nose and throat, headache, and epistaxis. Treatment to eradicate allergies completely is not available, such that the treatment for allergic rhinitis is essentially to try to control the disease. A cure is not anticipated soon but control of symptoms is a reasonable and attainable goal. Currently the traditional treatment is composed of nasal decongestant, antihistamine, local and systemic corticosteroids therapy. Unfortunately symptoms recur immediately after stopping treatment, and this treatment have its drawbacks and side effects[(8).] Nowadays radio surgery is strongly suggested as an alternative for these measures. Radio-surgery is a process of cutting and coagulation using a high frequency electric current, the radio surgery unit consists of a transformer, power supply, amplifier and electrical circuits [(1)].Recent studies demonstrate that radio surgery appears to be an effective and safe tool for treating allergic rhinitis with poor response to medical therapy[(2)].

Radiofrequency ablation causes ionic agitation in the tissue, inducing sub-mucosal necrosis. The resultant fibrosis of the sub-mucosa adheres the mucosa to the turbinate periosteum, reducing the blood flow to the turbinate. Resultant wound contraction causes volume reduction of the inferior turbinate without damage to the overlying mucosa. The advantage of this procedure:

- Mucosal preservation, which reduces risks of bleeding and crusting postoperatively.
- Can be performed under local anesthesia in a clinic setting and can be repeated if optimum results are not achieved initially.
- Most patients do not require any postoperative pain medication and no nasalpacking is required [2,3,4].

The purpose of this study was to evaluate the outcome of radiofrequency using (Ellman) surgitron on allergic rhinitis among patients unresponsive to medical treatment**. Our objectives were:**

1. To study the impact of radiofrequency in management of nasal discharge, obstruction, itching, sneezing, anosmia, snoring, headache eye itching.
2. To determine patient satisfaction on the radiofrequency for treating allergic rhinitis.

Materials and methods

Twenty patients (11 males and 9 females) were included from the author's private clinic in Gaza City and were clinically evaluated prospectively. All of the patients had allergic rhinitis unresponsive to medical therapy. These patients underwent radiofrequency to the inferior turbinate using Ellman Radiofrequency Instrument (Surgitron FFPF, (Ellman International Inc; Hewlett, New York**)**.

Nasal needle electrode (standard bipolar probe with absyonet needle with parallel 4 cm needle affixed 3 mm apart for precision tissue destruction) with current amplitude rectified at 2-2.5 at coagulation mode. The needle was located superficially on all parts of the mucosa in the turbinate without penetration for 3-5 minutes under local anesthesia in the clinic by using meperacain (3%). Clinical evaluation and follow up was done: before radio surgery and after 2 and7 days for acute complications and 6 and12 months of radiosurgery. Degree of clinical evaluation was ranked as: Minimal, Mild, Moderate, and Severe symptoms. The results of clinical evaluation after radiofrequency were interpreted as: Improved, Ungrateful (mild response), Recurrent, No response

- Nasal symptoms were evaluated with standard symptom scoring. Results were interpreted as responsive (improved) and non-responsive (mild response, recurrent, no response).
- **Analysis of data was performed** By McNemar test, where the significance of the paired results can be simply tested and the results are approximately normally distributed under the null hypothesis, using the following formula: $Z= (n_2-n_1)/ (n_1+n_2)$.
- In all symptoms, the baseline number of patients who were interpreted as non responsive before radiofrequency, were compared with non responsive number after 6 months, also the same baseline patients were compared with non responsives after 12 months (each symptom separately)

Results and discussion

Nasal discharge

Improved cases after 6 months of radiosurgery were 14 (70%) (p value 0.027), decreasing to 11 (55%) (p value 0.045) after 12 months. Non responsive cases were distributed as follows: 4 (20%) cases showed mild response decreasing to 1 (5%) after 12 months, 1 (5%) had no response after 6 month increasing to 5 (20%) after 12 months of therapy (table 1).

This result comes close to the results of Lin Hc study which showed that 55.2% of cases improved after 2 years of radiofrequency [2].

Table :(1) Follow up of nasal discharge by response of cases

	Improved		Mild response		Recurrence		No response		Total
Discharge	6months	12months	6months	12months	6months	12months	6months	12months	
Minimal	2	2	0	0	0	0	0	0	2
Mild	6	5	1	0	1	0	0	3	8
Moderate	3	3	0	0	0	0	0	0	3
Severe	3	1	3	1	0	3	1	2	7
Total	14	11	4	1	1	3	1	5	20

After 6 months z score = 2.7 where n_2=20 and n_1=6 p value 0.0027. After 12 months z score = 2 (where n_2=20 and n_1= 9) p value 0.045

Obstruction

Cases that showed improvement were 17 (85%) (p value 0.001), dropping to 16 (80%) (p value 0.0016) after 12 months of therapy, non-responsive cases were distributed as follows: 2 cases showed mild response after 6 months of therapy decreasing to one after 12 months. One case showed no response to therapy after 6 months increasing to 3 cases after 12 months (table 2).

The results come close to the results of Back LJ study on 20 patients, assessing the efficacy and morbidity of radio frequency for inferior turbinates in patients with nasal obstruction caused by turbinate hypertrophy. His results showed statistically significant improvement in the 12 month follow up without relapses[5]

Table: (2) Nasal obstruction by response of cases

	Improved		Mild response		Recurrence		No response		Total
Obstruction	6months	12months	6months	12months	6months	12months	6months	12months	
Minimal	0	0	0	0	0	0	0	0	0
Mild	2	2	0	0	0	0	0	0	2
Moderate	5	5	0	0	0	0	0	0	5
Severe	10	9	2	1	0	0	1	3	13
Total	17	16	2	1	0	0	1	3	20

After 6 months z scores = 3.5 p value 0.001, after 12 months z scores = 3.47 p value = 0.001

Itching

Total improved cases were 18 (90%) after 6 and 12 month of treatment. (z scores = 3.3 p value 0.001

Sneezing

Recovered cases after 6 months of therapy were 17 (85%) (p value 0.001) dropping to 14 (70%) {p value 0.001} cases after 12 months. Non responsive cases were distributed as follows: 2 (10%) cases had mild response after 6 months increased to 4 (20%) after 12 months, there was only one case who showed recurrence after 6 months and 2 (10%) showed no response after 12 months (table 3).

Table: (3) follow up of sneezing by response of cases:

	Improved		Mild response		Recurrence		No response		Total
Sneezing	6months	12months	6months	12months	6months	12months	6months	12months	
Minimal	3	3	0	0	0	0	0	0	3
Mild	1	1	1	1	0	0	0	0	2
Moderate	6	5	0	1	0	0	0	0	6
Severe	7	5	1	2	1	0	0	2	9
Total	17	14	2	4	1	0	0	2	20

After 6 months z scores = 3.5 p value 0.001, after 12 months z scores = 2.7 p value – 0.001

Snoring

Improved cases were 13 (65%) (p value Not significant) dropped to 12 (60%) after 12 months, 6 (30%) (p value Not significant). Not responded cases were distributed as: 1 (5%) had mild response after 6 months dropped to 4 (20%) after 12 months, 1(5%) recurrence after 6 and 12 months and 3 (15%) cases had no response after 12 months of therapy.

Headache

Improved cases after 6 months were 16 (80%) (p value 0.001) dropping to 14 (70%) (p value 0.001) after 12 months. Non responsive cases were distributed as:3 cases showed mild response after 6 months of therapy increasing to 4 (20%) cases after 12 months, 1 case had recurrence after 6 months and 2 cases had no response after 12 months.

Eye itching

Improved cases were 18 (90%) (p value 0.001) after 6 months dropped to 17 (85%) (p value 0.001) after 12 months. Non responsive cases were distributed as follows: 1 case showed mild response after 6 and 12 month of therapy, 1 case had recurrent symptoms after 6 month and 1 case showed no response.

Anosmia

After 6 months of radiofrequency therapy 20 cases improved (100%) (p value<0.001) dropping to 18 (90%) (p value 0.001) after 12 months.

Safety and patient satisfaction

There were no complications and there was an absence of pain. No bleeding, infection, adhesions, injury to neither olfactory nerve nor worsening of allergic symptoms, was observed. This was similar to the results as of Lin,HC study[2], Back LJ study [6]. Coste A study[5], and Fischer Y study[7]. The majority of recovered cases had a reduction of drug intake for allergic rhinitis for a minimum of one year, which improved the quality of lifefor most patients.Most of patients stated that they will consider repeating this procedure if necessary and will recommend the new method to their friends with the same problems.

Males and adolescents alike showed very good responses with radio surgery. Recurrence was observed more frequently in females.

Conclusion

Radiofrequency showed great improvement of all symptoms of allergic rhinitis and proved safe with absence of side effects. This observation is similar to that of M Madani study in 1999 where the results showed 60-80% improvement in symptoms of obstruction, congestion and watery nasal drainage resulting from either allergic or vasomotor rhinitis, following radiofrequency treatment[8].

Radiofrequency is highly cost benefit and cost effective therapy for treating most symptoms of

allergic rhinitis. It is an effective and safe tool for treating cases of allergic rhinitis refractory to medical treatment where the patient needs two cycles of medications one in spring and the another in autumn (each cycle lasts for three months). Drawbacks of using drugs for the management of allergic rhinitis include: immediate recurrence of symptoms after cessation of medical treatment, potential side-effects of systemic drugs and cost of medications, which is comparable to using radiofrequency. Radiofrequency management is an effective modality for reducing nasal symptoms related to the allergic rhinitis.

Using radiofrequency had no side effects, contrary to all the medical treatments. It may be helpful in the management of severe allergic rhinitis unresponsive to management using drugs.

Recommendations

- To consider this type of therapy for severe allergic rhinitis cases and not only cases not responsive to therapy using drugs.
- More studies correlating the relationship of response and that of age and sex of patients is require.

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