

Radiofrequency Ablation (Coblation) Treatment of Inferior Turbinate Hypertrophy

TAHIR RASHID, IMRAN SAEED, SALMAN BAIG

ABSTRACT

Background: Nasal obstruction caused by soft tissue hypertrophy of the inferior turbinates is one of the most common presentations in otorhinolaryngology. Most of the times medical treatment fails to relieve the obstruction.

Aim: To assess the efficacy of radiofrequency volumetric tissue reduction (RFVTR) "COBLATION" of inferior turbinate in relieving nasal obstruction.

Study Design: Prospective, clinical trial.

Method: A total of 40 patients with chronic nasal obstruction due to hypertrophied inferior turbinates with positive decongestant test were treated with radiofrequency treatment under local anaesthesia. Pre operative and post operative fairly nasal scores mean were calculated subjectively to assess the percentage improvement in nasal obstruction.

Results: By the end of 3 months nasal obstruction improved by 85.65%, other symptoms like rhinorrhea, sneezing, headache and snoring also improved. Overall improvement (collective symptoms improvement) was 71.80% with out any major complication.

Conclusion: RFVTR of inferior turbinate is safe and effective method of relieving nasal obstruction and other associated symptoms due to inferior turbinate hypertrophy, without affecting the turbinate mucosal function. Procedure can be done under local anaesthesia as an office procedure. There are no serious intraoperative and post operative complications except for blood stained discharge and crusting in few patients. Follow results are assessed both subjectively and objectively. As the procedure is relatively new further studies with longer follow up are required to assess the long term effects on the nasal obstruction.

Keywords: Nasal obstruction, turbinate hypertrophy, radiofrequency volumetric tissue reduction

INTRODUCTION

Nasal obstruction is the one of the most common complaint encountered in otolaryngology practice. Inferior turbinate hypertrophy is one of the most common cause of nasal obstruction, may be observed in allergic rhinitis, vasomotor rhinitis, chronic hypertrophic rhinitis or, sometimes compensatory response to deflected nasal septum¹. Conservative therapy including local and systemic decongestants, steroids nasal sprays and antihistamines either produce short term relief or are often ineffective². Various surgical techniques have been described to reduce the volume of inferior turbinates. Conventional surgeries are partial and total turbinectomies, submucosal turbinectomy, laser ablation, electrocautery and cryosurgery³. Turbinate surgery ideally should result in an improvement in nasal obstruction with mucosal preservation and less likelihood of atrophic rhinitis complications⁴. Less destructive technique such as radiofrequency volumetric tissue reduction (RFVTR) (COBLATION) have been introduced for turbinate reduction^{5,6}.

Radiofrequency is applied to inferior turbinate submucosally which cause an ionic chaos at cell level. This ionic change results in local heat increase, thus creating a deep thermal lesion. Healing occurs with fibrosis which shrinks the surrounding tissues, in our case the inferior turbinate⁷. Aim of this study is to evaluate subjectively the efficacy of radiofrequency volumetric tissue reduction of inferior turbinates in relieving nasal obstruction as a major symptom. Improvement in other symptoms such as rhinorrhea, sneezing, headache and snoring along with complications would also be studied.

MATERIAL & METHODS

A prospective study on 40 selected patients was carried out, who presented with chronic nasal obstruction and hypertrophied inferior turbinates that did not respond to any kind of medical treatment. Only patients who passed decongestant test were included in the study. Patients with bony enlargement of inferior turbinates, deflected nasal septum, nasal polyps and previous surgeries on turbinates were excluded from the study. After complete history and ear nose throat examination including endoscopic evaluation of inferior turbinates, informed consent

Department of ENT, FJMC/ Sir Ganga Ram Hospital, Lahore
Correspondence Dr. Tahir Rashid, Assistant Professor, 107 Block
Q Model Town Lahore Email: tahir1964@hotmail.com.

was obtained for radiofrequency (Coblation) treatment of inferior turbinates. A questionnaire was developed for nasal obstruction, rhinorrhea, sneezing headache and snoring. Fairly Nasal Scoring System (8), standardized and validated tool, was used to rate all the symptoms pre and post operatively. The scoring was done as follows; 0=no problem, 1=mild problem, 2=moderate problem, 3=severe problem. Post operative improvement was defined as decrease of one grade. Mean values were taken to calculate the percentage improvement at 1 week, 1 month and 3 months statistically.

Radiofrequency (Coblation) was performed under local anaesthesia. Cotton pledgets soaked with 4% xylocaine and oxymetazoline were placed in the nose for 10 mins. 1cc normal saline mixed with 1cc of 2% xylocaine was injected directly in each inferior turbinate. Radiofrequency device (Coblator II with Re Flex 45 wand, Arthrocare USA) was used to coblate inferior turbinates. ReFlex 45 wand needle was introduced at three different places on each turbinate and energy was delivered for 10 seconds for each insertion. Ablate mode was kept at level 4-5. No bleeding was observed after procedure and all patients were discharged home after two hours with follow up visits at 1 week, 1 month and 3 months.

RESULTS

Forty patients, 24 females and 16 males with the mean age of 28 years were included in the study. All

patients (100%) were complaining of nasal obstruction. Other symptoms like rhinorrhea (87.5%), sneezing (60%), headache (25%) and snoring (40%) (Table 1). Fairly nasal scoring system was applied to rate each symptom and their means were calculated (Table 2). Similarly post operative means were also calculated at 1 week, 1 month and 3 months post operatively. All the data was analysed statistically and percentage improvement for each symptom was calculated at 1 week, 1 month and 3 months (Table 3). Nasal obstruction, rhinorrhea and snoring did not show much improvement in the first post operative week. These symptoms gradually improved after a month and maximum improvement was noticed after three months (nasal obstruction improved by 85.65%, rhinorrhea 47.52% and snoring (84.88%) (Table 3). Sneezing and headache showed 53.48% and 63.33% improvements after 3 months. Mean pre operative symptom score for all symptoms was 5.32 and post operative (3 months) mean score was 1.5. This shows a marked percentage improvement of 71.80 for all symptoms collectively. 85% of the patients were satisfied with the procedure and results. No major complication was noted during and after surgery. Minor complications with their percentages (Table 4). Pre operative mean scores were calculated using Fairly nasal scoring system for nasal obstruction (2.3), rhinorrhea (1.01), sneezing (0.86), headache (0.3) and snoring (0.86) (Table 2).

Table 1: Pre operative symptoms percentage in 40 patients

Symptoms	n	%age
Nasal Obstruction	40/40	100
Rhinorrhoea	35/40	87.5
Sneezing	24/40	60
Headache	10/40	25
Snoring	16/40	40

Table 2: Pre operative symptoms & fairley nasal scoring mean

Symptoms	Asymptomatic	Mild 1	Moderate 2	Severe 3	Mean
Nasal Obstruction	Nil	Nil	28	12	2.3
Rhinorrhoea	5	14	16	5	1.01
Sneezing	16	4	12	8	0.86
Headache	30	4	4	2	0.3
Snoring	14	8	10	8	0.86

Table 3: Pre operative & post operate means with percentage improvements.

Symptoms	Preop mean Fairly nasal score	1 week Postop		1 month Postop		3 months Postop	
		Mean Fairly nasal score	%age improvement	Mean Fairly nasal score	%age improvement	Mean Fairly nasal score	%age improvement
Nasal Obstruction	2.3	1.86	19.13	0.53	76.95	0.33	85.65
Rhinorrhoea	1.01	1.16	- 14.85	0.73	27.72	0.53	47.52
Sneezing	0.86	0.36	58.13	0.6	30.23	0.4	53.48
Headache	0.3	0.16	46.66	0.15	50	0.11	63.33
Snoring	0.86	1.06	- 23.25	0.25	70.93	0.13	84.88

Table 4: Post operative Complications

Complication	Immediate Post op	1 week postop	1 month postop	3 months postop
Bleeding	NIL	NIL	NIL	NIL
Blood stained nasal discharge	28 (70%)	5 (12.5%)	NIL	NIL
Pain	8 (20%)	5 (5%)	1 (2.5%)	NIL
Crusting	NIL	15 (37.5%)	NIL	

DISCUSSION

Inferior turbinate hypertrophy is the commonest cause of chronic nasal obstruction that affects upto 20% of the European general population⁹. In the underdeveloped countries this ratio is even more. Conservative treatments failed to show long standing results in many cases¹⁰. Radiofrequency coblation, ultrasound treatment, microdebrider assisted inferior turbinoplasty, laser ablation and submucosal diathermy techniques have produced good results^{11,12,13}. Many studies have claimed the effectiveness of radiofrequency assisted volumetric tissue reduction RFVTR (COBLATION) in reducing the nasal obstruction caused by inferior turbinate hypertrophy as in our study^{14,15,16}. Sapei et al (2003) have found that RFVTR of turbinates was effective in improving nasal obstruction objectively and in preserving nasal mucocilliary function as compared to laser ablation, which improved the nasal obstruction but significantly disturbed the mucocilliary function¹⁷.

Nasal obstruction begins to improve after coblation and the maximum improvement is noted after 3 months as shown in other studies where nasal obstruction improved by 81.3%, 93.8% and 89.4%. Our study claimed 85.65% improvement in nasal obstruction 3 months post coblation^{18,19}. Other symptoms in this study, like rhinorrhea and sneezing improved by 47.52% and 53.48% respectively which are less than the other studies which claim 95.6% improvement in rhinorrhea and 97.8% in sneezing. This difference can be due to environmental factors like cold and humid climate and also depends upon the etiology of inferior turbinate hypertrophy^{20,21}. Significant improvement was noted in headache and snoring 63.33% & 84.88% respectively and is comparable with other studies^{16,20}.

There are no doubts about the efficacy and safety of the coblation turbinate reduction²¹. No major complications occurred in our 40 patients. Most of the (70%) patients complained of blood stained watery nasal discharge immediately after procedure which settled in few days. 37.5% patients complained of crusting in the second post operativeweek . Saline nasal irrigation reduced the crusting, itching and sneezing but had no additional benefit in terms of nasal obstruction (23). Eight patients had mild pain in

the first post operative week which was settled by 6-7th day. These results are similar to other studies¹⁹.

CONCLUSION

RFVTR of inferior turbinate is safe and effective method of relieving nasal obstruction and other associated symptoms due to inferior turbinate hypertrophy, without affecting the turbinate mucosal function. Procedure can be done under local anaesthesia as an office procedure. There are no serious intraoperative and post operative complications except for blood stained discharge and crusting in few patients. Follow results are assessed both subjectively and objectively. As the procedure is relatively new further studies with longer follow up are required to assess the long term effects on the nasal obstruction.

REFERENCES

1. C Cingi, B Ure, H Cakli, E Ozudogru. Microdebrider-assisted versus radiofrequency-assisted inferior turbinoplasty: prospective study with objective and subjective outcome measures. *Acta Otorhinolaryngol Ital.* 2010 June; 30(3):138:143.
2. Abdul Aziz Ashoor. Efficacy of Submucosal Diathermy in Inferior Turbinate Hypertrophy . *Bahrain Medical Bulletin.*Vol. 34. No. 1.March 2012.
3. Hol Mk, Huzing EH. Treatment of inferior turbinate pathology: a review and critical evaluation of different techniques. *Rhinology* 2000; 38:157-66.
4. Lee JY, Lee JD. Comparative study on the long-term effectiveness between coblation- and microdebrider-assisted partial turbinoplasty. *Laryngoscope* 116:729-735,2006.
5. Nease CJ, Krempf GA. Radiofrequency treatment of turbinate hypertrophy: A randomized blinded, placebo-controlled clinical trail. *Otolaryngol Head Neck Surg* 130:291-299,2004.
6. Chang CW, Ries WR. Surgical treatment of inferior turbinate: New techniques. *CurrOpinOtolaryngol Head Neck Surg* 12:53-57,2004.
7. GaffarAslan, M.D. Postnasal drip due to inferior turbinate perforation after radiofrequency turbinate surgery: A case report. *Allergy Rhinol* 2013 spring; 4(1): e17-e20, May 2013.
8. Fairley JW, Yardley MPJ, Durham LH, Parker AJ. Reliability and validity of a nasal symptom questionnaire for use as an outcome measure in clinical research and audit of functional endoscopic sinus surgery. *Clinical Otolaryngology*:1993;18: 436-437.

9. Incandela C, Calamusa G, Massenti MF, Incandela S, Speciale R, Amodio E. Long-term efficacy or radiofrequency treatment of turbinate hypertrophy: a patient based point of view. *Indian J Otolaryngol Head Neck Surgery*.2013 Aug;65:226-30.
10. Saleh HA, Durham SR. Perennial Rhinitis. *BMJ*2007; 335(7618): 502-7.
11. Back LJ, Hytonen ML, Malmberg HO, Ylikoski JS. Submucosal bipolar radiofrequency thermal ablation of inferior turbinates: Along-term follow-up with subjective and objective assessment. *Laryngoscope*. 2002;112(10): 1806-1812..
12. Gindros G, Kantas I, Balatsouras DG, et al. Comparison of ultrasound turbinate reduction, radiofrequency tissue ablation and submucosal cauterization in inferior turbinate hypertrophy. *Eur Arch Otorhinolaryngol*. 2010;267(11):1727-1733
13. Bhandarkar, Naveen D,Smith, Timothy I.Current Opinion in Otolaryngology & Head & Neck Surgery: Feb 2010; Vol 18, issue 1 49-53.
14. Banhiran W, Tantilipikorn p, Metheetrairut C, Assanasen P, Bunnag C. Qulaity of life in patients with chronic rhinitis after radiofrequency inferior turbinate reduction. *J Med Assoc Thai* 2010;93:950-60.
15. Porter MW, Hales NW, Nease CJ, Krempel GA. Long-term results of inferior turbinate hypertrophy with radiofrequency treatment: A new standard of care? *Laryngoscope* 2006;116:554-7.
16. Kizilkaya Z, Ceylan K, Emir H, Yavanoglu A, Unlu I, Samin E, et al. Comparison of radiofrequency tissue volume reduction and submucosal reduction with microdebrider in inferior turbinate hypertrophy. *Otolaryngol Head Neck Surg* 2008;138:176-81.
17. Sapci T, Sahin B, Karavus A, Akbulut UG. Comparison of the effects of radiofrequency tissue ablation, CO2 laser ablation, and partial turbinectomy applications on nasal mucociliary functions. *Laryngoscope* 2003;113(3):514-519.
18. Rhee CS, Kim DY, Won TB, Lee HJ, Park SW, Kwon TY, et al. Changes of nasal function alter temperature controlled radiofrequency tissue volume for turbinate. *Laryngoscope* 2011;111:153-8.
19. Pardipta Kumar Parida, KarishnapriyaSonathosh, SivaramanGanesan, GopalakrishnanSurianaryanan, Sunil Kumar Saxena. The efficacy of radiofrequency volumetric tissue reduction of hypertrophied inferior turbinate in allergic rhinitis. *Indian Journal of Medical Sciences*. 2011;65(7):269-277.
20. Cavaliere M, Mottola G, lemma M. Monopolar and bipolar radiofrequency thermal ablation of inferior turbinates. 20 moth follow-up. *Otolaryngol Head Neck Surg* 2007;137:256-63.
21. Lin HC, Lin PW, Friedman M, Chang HW, Su YY, Chen YJ, et al. Long-term results of radiofrequency turbinoplasty for allergic rhinitis refractory to medical therapy. *Arch Otolaryngol Head Neck Surg* 2010;136:892-5.
22. Bran GM, Hunnebeck S, Herr RM, Hormann k, Stuck BA. Bipolar radiofrequency volumetric tissue reduction of inferior turbinates: evaluation of short-term efficacy in a prospective, randomized, single-blinded, placebo-controlled crossover trail. *Eur Arch Otorhinolaryngol* 2013;270(2):595-601.
23. Hirunwiwatkul P, UdomchotphruetP. Efficacy study of nasal irrigation after radiofrequency tissue volume reduction for inferior turbinate hypertrophy: An equivalence randomized controlled trail. *Am J Rhinol Allergy* 2012;26(6):497-503.