



Otorhinolaryngology

COMPARATIVE EVALUATION OF THE OUTCOME OF COBLATION ASSISTED INFERIOR TURBINECTOMY VERSUS SUB MUCOSAL DIATHERMY FOR MANAGEMENT OF INFERIOR TURBINATE HYPERTROPHY.
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ABSTRACT As yet, there is no totally satisfactory means for treating hypertrophied turbinate sans the proper management of turbinate dysfunction remains in question. In the present series, two of the widely practiced surgical procedures (coblation and sub mucosal diathermy) for the reduction of the size of the inferior turbinates were evaluated and compared. In all case turbinectomy was performed as an isolated procedure. Sixty patients with inferior turbinate hypertrophy were selected and randomly divided into two groups and followed up post operatively for 06 months. Study of the result indicated that the beneficial effect of the operation is mainly mechanical by reduction of the resistance to nasal airflow. None of the procedure had a deleterious effect on olfactory acuity. The surgical technique, advantages and drawbacks of each of these procedures are discussed.

KEYWORDS :
INTRODUCTION

Chronic nasal obstruction is one of the oldest and most common human complaint. It can result either from nasal and septal deformities or from mucosal disease associated with turbinate hypertrophy. Anderson C. Hilding, (1950) states beside septal deviation, enlarged turbinates are the second most frequent cause of obstruction to nasal breathing.[1]

An ideal procedure for turbinate reduction should be associated with minimal discomfort or adverse reaction and should preserve the physiological function of the turbinates such as regulating the humidification and temperature of the inspired air. There have been at least 13 different techniques developed for the inferior turbinate hypertrophy with varying degree of impact over mucosal atrophy, tissue necrosis and crusting that essentially obliterates the functional structures of the nose, all the previous research studies concluded that the best surgical process is the one that achieves optimal turbinate volume reduction with preservation of function. Unfortunately that criterion still leaves multiple surgical technique currently in use.

This study compares the most commonly used inferior turbinate reduction surgical techniques:

- Coblation assisted inferior turbinoplasty
- And
- Submucosal diathermy.

MATERIAL AND METHODS

General settings : the study was done in a tertiary care hospital setting.

Study site : Dept of ENT- Head & Neck Surgery in metro city of India

STUDY POPULATION :

A prospective study will be carried out on the adult patients (>18 years) with medical refractory nasal obstruction, with history of nasal obstruction and findings of nasal obstruction on clinical examination.

STUDY DESIGN

A consecutive series of 60 adult patients (age > 18 years) with inferior turbinate hypertrophy with each 30 will undergo the coblation technique and sub mucosal diathermy. Symptoms will be assessed prior to treatment and post treatment on follow up period at 02 weeks, 03 months and 06 months. These symptoms are based on nasal symptoms questionnaire and measured on 5 point likert scale.

SAMPLE SIZE

Sample size was calculated keeping in view at the most 5% risk with minimum 80% power and 5% significance level (significant at 95% confidence level). However considering the past data, which gives idea of variation in the variables, which play important role in calculating the sample size. the sample size should be 25 in each group to be on the safer side for the normality of the data. Therefore, a sample size of 30

patient in each group was determined for comparative study of two modalities of surgery.

TIME FRAME:

It was a 24 months prospective study from May 2015 to April 2017.

INCLUSION CRITERIA FOR SELECTION OF PATIENTS

Patients with diagnosis of nasal obstruction for inferior turbinate hypertrophy based on clinical symptoms and endoscopic findings.

EXCLUSION CRITERIA

Patients with

- 1) Concurrent CRS.
- 2) Sinonasal polyposis
- 3) Substantial septal deviation

METHODOLOGY:-

A consecutive series of 60 adult patients (age ≥ 18 years) with inferior turbinate hypertrophy will each 30 undergo the coblation technique and Submucosal Diathermy. Subjective symptoms will be assessed prior to treatment and 2 weeks and 3 and 6 months intervals after treatment with rhinosinusitis symptoms inventory (RSI), which catalogs sinonasal symptoms, medication use and economic impact of nasal disorders and a short nasal symptom questionnaire measuring on a 5 point Likert scale:

- 1) Nasal obstruction
- 2) Amount of time with nasal obstruction
- 3) Nasal stuffiness
- 4) Excess mucus production
- 5) Post nasal drip
- 6) Snoring
- 7) Overall nasal symptoms

ALLOCATION:-

Patients were randomised for thirty patients were allotted to coblation assisted technique and thirty patients allotted to sub mucosal diathermy.

• SUBMUCOSAL DIATHERMY FOR CHRONIC NASAL OBSTRUCTION DUE TO TURBINATE ENLARGEMENT :

The operation involved insertion of a diathermy needle into the anterior end of the inferior turbinate, advancement of the needle sub mucosally until the posterior end of the turbinate was reached, and withdrawal of the needle over a 30 second period each side with the current applied. The patients were evaluated 2 weeks and 3 and 6 months postoperatively by means of a questionnaire about breathing through the nose, rhinoscopic assessments, and airflow measurements using the nasal plate.

• COBLATION ASSISTED INFERIOR TURBINATE REDUCTION

The anterior nasal cavity was topically anesthetized with cotton pledgets soaked with lignocaine spray. Each anterior inferior turbinate was infiltrated with 2.5 ml of 1% lidocaine followed by left and right piriform aperture infiltrations with 2.0 ml of 1% lidocaine. The bipolar cold ablation wand was coated with electrolyte gel and under direct vision, 2/3 passes were made into the anterior third of each inferior turbinate. The number and depth of passes were determined by the pre-operative turbinate size and visual shrinkage during the procedure. Any persistent bleeding was handled with the placement of thin cotton pledgets.

STATISTICAL METHODS

Categorical variables were presented in number and percentage (%) and continuous variables were presented as MEAN +/- SD. Normality of data was tested by Kolmogorov – Smirnov test.

Statistical tests were applied as follows-

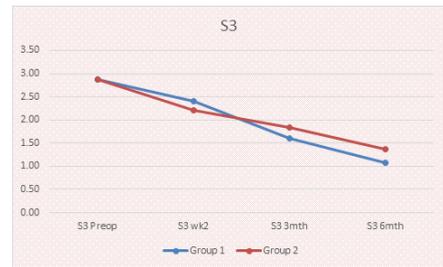
1. Quantitative variables were compared using independent T test
2. Qualitative variables were compared using Chi-Square test/Fischer's exact test
3. Student unpaired t-test was applied to test the difference between mean values in two groups. Paired t-test was used to see the change in a variables with respect to time
4. Anova test followed by post-hoc test was applied for testing mean values between more than 2 groups.

RESULTS

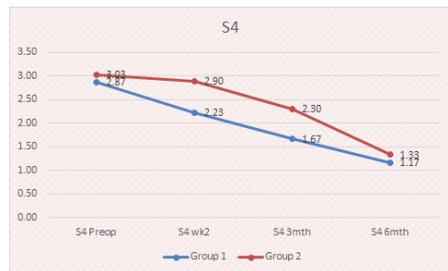
INDEX-

- PROCEDURE 1- SUB MUCOSAL DIATHERMY
- PROCEDURE 2 – COBLATION ASSISTED INFERIOR TURBINOPLASTY
- AGE GROUP 1- 21-30 YEARS
- AGE GROUP 2- 31-40 YEARS
- AGE GROUP 3- 41-50 YEARS
- SEX CODE 1- MALE
- SEX CODE 2- FEMALE
- S1/SYMPTOM1-NASAL OBSTRUCTION
- S2/SYMPTOM2-AMOUNT OF TIME WITH NASAL OBSTRUCTION
- S3/SYMPTOM3-NASAL STUFFINESS
- S4/SYMPTOM4-EXCESS MUCUS PRODUCTION
- S5/SYMPTOM5-POST NASAL DRIP
- S6/SYMPTOM6-SNORING
- S7/SYMPTOM7-OVERALL NASAL SYMPTOMS

B		Group 1	Group 2	As per P value
2	S2 Preop	3.40	3.57	Insignificant
2	S2 wk2	2.63	2.50	
2	S2 3mth	1.83	2.37	
2	S2 6mth	1.27	1.47	



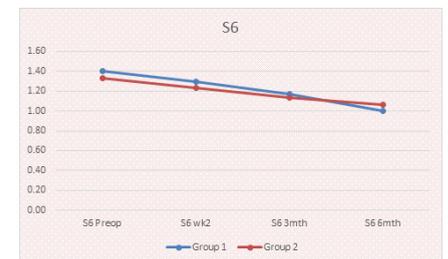
B		Group 1	Group 2	As per P value
3	S3 Preop	2.87	2.87	Insignificant
3	S3 wk2	2.40	2.20	
3	S3 3mth	1.60	1.83	
3	S3 6mth	1.07	1.37	



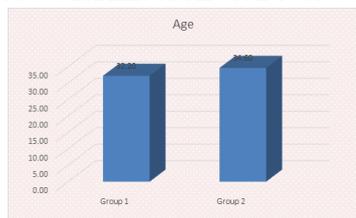
B		Group 1	Group 2	As per P value
4	S4 Preop	2.87	3.03	Insignificant
4	S4 wk2	2.23	2.90	
4	S4 3mth	1.67	2.30	
4	S4 6mth	1.17	1.33	



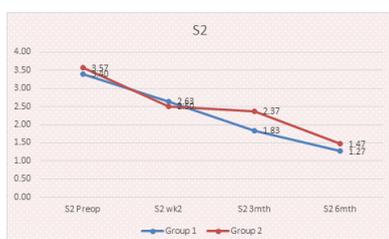
B		Group 1	Group 2	As per P value
5	S5 Preop	2.27	1.67	Insignificant
5	S5 wk2	1.83	1.43	
5	S5 3mth	1.43	1.30	
5	S5 6mth	1.10	1.17	

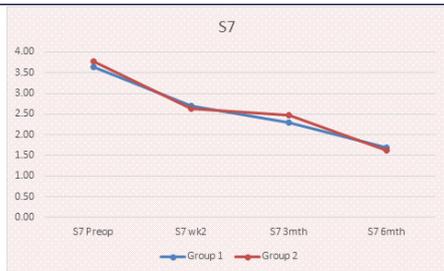


B		Group 1	Group 2	As per P value
6	S6 Preop	1.40	1.33	Insignificant
6	S6 wk2	1.30	1.23	
6	S6 3mth	1.17	1.13	
6	S6 6mth	1.00	1.07	



B		Group 1	Group 2	As per P value
1	S1 Preop	3.73	4.00	Insignificant
1	S1 wk2	2.63	2.63	
1	S1 3mth	2.30	2.63	
1	S1 6mth	1.77	1.87	





B		Group 1	Group 2	As per P value
7	S7 Preop	3.63	3.77	Insignificant
7	S7 wk2	2.70	2.63	
7	S7 3mth	2.30	2.47	
7	S7 6mth	1.70	1.63	

DISCUSSION

This study includes group 1 for sub mucosal diathermy with 14 males and 16 females (total 30). Pre operative Nasal questionnaire score on 5 point Likert scale was 4 for 17 patients, 3 for 11 patients, and 5 for 02 patients. Follow up at 03 months shows score of 3 in 16 patients, score of 2 in 11 patients and score of 01 in 03 patients. Follow up score at 06 months shows score of 3 in 01 patient, 02 in 17 patients and 01 in 12 patients. Whereas in group 2 who were treated with coblation assisted technique includes 17 males and 13 females. Pre operative nasal questionnaire score were 04 for 15 patients 03 for 11 patients and 05 for 04 patients. Follow up score at 03 months shows score of 03 in 16 patients, 02 in 13 patients, and 01 in 01 patient. At 06 months follow up period score of 03 found in 02 patients, 02 in 17 patients, and 01 in 11 patients.

Compared to study by Friedmann et al [2] where scabbing was not actually observed after partial turbinectomy, incidence of nasal crusting found in 3 patients (9.9%) in group 1 studies at 06 months post operative follow up in our study.

Same as that to the study done by Jones AM, Lancer JM [3], in our study also the nasal mucosa was left untouched, which reduced the potential of swelling with hypertrophied mucosa.

In this study regarding the duration of the application of electricity for the patients treated with sub mucosal diathermy, the opinions in the literature differ, between 3 and 6 seconds are reported [4][5]

In case of laser surgery, the long-term results are not encouraging, however, as the effect of turbinate reduction are not permanent. Lippert and Werner showed in a retrospective comparative therapy study that after 2 post operative years only 36% of patients were satisfied with the result [6].

Meta-analysis by Hytonen and coworkers [7] who came to the conclusion that radiofrequency therapy of the turbinate represents a safe, and for the patient less stressful procedure, this study is also comparable with same observation over the outcome of the procedure.

On the same lines study done by Coste A et al [8] who carried out study to evaluate the safety and efficacy of radiofrequency for reduction of inferior turbinate and concludes that radiofrequency is safe surgical procedure capable of reducing turbinate volume without altering the nasal mucosa, and causing minimal discomfort for the patient, is comparable or same as far as the outcome of the procedure in this study is concerned.

Compared to Rhee CS et al. [9] who compared the nasal functions after the treatment of radio frequency tissue volume reduction (RFTVR) and laser vaporizing turbinoplasty (LVT) using subjective symptoms scores and objective tests concludes that objective nasal functions including nasal volume and the total nasal resistance were significantly improved at 8 weeks after surgery in both groups, this study also states that symptoms of nasal obstruction and overall nasal symptoms are benefitted with both the procedures which was more relevant and comparable at longer duration of follow up period at 03 months and 06 months of post op follow up period in this study.

Utley et al [10] also reported excellent results in 10 patients with 8 weeks follow up for radiofrequency inferior turbinate reduction using

2 lesions per turbinate and a longer needle, which when compared to this study 02/03 passes were made which were determined by pre operative turbinate size and visual shrinkage during the procedure. In study done by Tarik sapsi et al [11] who carried out prospective, randomized clinical trial study conducted on 3 groups of 45 adult volunteer patients with symptoms and signs of nasal obstruction and stuffiness related to enlarged turbinates and demonstrated both radiofrequency and partial turbinectomy are effective in improving nasal obstruction objectively but needs a longer follow up period for evaluation of long term improvement of symptoms which was carried out in our study in the form of post op follow up period at 03 months and 06 months. Study by Tarik sapsi et al [11] also mentioned 1 case of synechiae formation (needed to be cured by opening) which was not observed in our study.

Regarding post op complications Neil bhattacharya et al [12] who carried out study with consecutive series of 26 adults patients with inferior hypertrophy who were treated with the coblation technique in the office setting mentioned 2 patients having post op epistaxis (8.3%) out of which 1 required 24 hrs anterior nasal packing and crusting was observed in 4 patients (16.7%). In our study incidence of complication in form of epistaxis found in 02 patients (6.66%) and 01 patient (3.33%) in group 1 and group 2 studies respectively (total 3 patients, 5%) at 02 week post operative follow up period. incidence of nasal crusting found in 3 patients (9.9%) in group 1 studies at 06 months post operative follow up.

In a hybrid technique Erik M. Wolfswinkel et al [13] combines coblation technique with the basic outfracture technique and found this hybrid technique to be more effective than performing nasal turbinate coblation or an outfracture technique alone. This creates a scope for further study by combining various techniques and compare the outcome as in our study we applied a single technique to a respective group.

Follow up period differs and compared here with Li and associates [14] who reported excellent results with this technique in a series of 22 patients with inferior turbinate hypertrophy. Substantial decreases in the degree of nasal obstruction and time were noted; but follow up in that pilot study was limited to 8 weeks as compared to follow up period of 02 weeks, 03 months and 06 months in this study and results when compared are in favour of relief of overall nasal symptoms significantly after 12 weeks or 03 months in this study.

Compared to study by Dawes et al [15] stating overall post operative complication rate 20% and that of significant reactionary and secondary haemorrhage in 9% incidence of complication in form of epistaxis found in 02 patients (6.66%) and 01 patient (3.33%) in group 1 and group 2 studies respectively at 02 week post operative follow up period and incidence of nasal crusting found in 3 patients (9.9%) in group 1 studies at 06 months post operative follow up.

With a variable follow up period done by Vonhaache et al [16] in a study of 204 patients who underwent sub mucosal diathermy of the inferior turbinates between 1977 and 1983. 60 patients have been followed up by questionnaire, for periods ranging from 1 to 5 years since surgery and a benefit was noted in upto 72% of cases as compared to this study with a follow up period at 3 stages till 06 months after study.

Farmer [17] confirms short term benefits in his research and emphasizes that therapeutic success is best with those patients who preoperatively already exhibited the least airway resistance. He recommends that preoperative patient selection should be geared to this, thus creating a further scope in this study in respect to pre op nasal airway resistance and longer follow up.

CONCLUSION

Our results also indicate that benefits from successful inferior turbinate reduction are likely to be durable for 6 months. In this study there was increased nasal symptoms score at post op follow up at 03 weeks for coblation assisted inferior turbinate reduction in which the excessive mucous production was the most common and prominent symptom when compared to group of patients treated with sub mucosal diathermy. Post op follow up at 6 months shows slight variation in nasal symptoms score between submucosal diathermy and coblation assisted techniques for inferior turbinate reduction which is insignificant statistically.

Keeping Overall nasal symptoms in view Group 2 patients (treated with coblation assisted technique) shows relatively better response immediately after operation when compared to group 1 (treated with sub mucosal diathermy) which was obvious at 02 week post op follow up . At 03 weeks post op follow up there is slight increase in score for group 2 when compared to group 1 with gradual improvement in score for both the groups. At 06 months post op follow up there was insignificant difference in nasal score statistically with group 2 on the better side.

This shows that both coblation assisted technique and sub mucosal diathermy are showing equally good results when followed up for longer duration.

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