Section: Biochemistry

Original Research Article

A STUDY TO COMPARE EFFICIENCY OF DIFFERENT SURGICAL TECHNIQUES FOR INFERIOR TURBINATE REDUCTION

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Abstract

Many Surgical Techniques are prescribed for inferior turbinate reduction. Inferior turbinate hypertrophy is seen Chronic Allergic Rhinitis Cases, Vasomotor Rhinitis Cases, Over use of Nasal decongestants Patients will suffer from Nasal stuffiness and obstruction. When Medical Management fails, it should be surgically intervened. Out of many techniques of reducing turbinate size, we have chosen Out fracturing the turbinate, Sub mucosal Diathermy, Partial Turbinate Resection, Conventional Turbinoplasty techniques in our study to compare efficiency among them using Nasal Obstruction Symptom Scale (NOSE) scoring System. We found Conventional Turbinoplasty is best.

INTRODUCTION

Blockade of the nose is common symptom with Deviated Nasal Septum, hypertrophied turbinates, Nasal polypi as common etiologies. Hypertrophy of inferior turbinate is one among the most common cause.[1] Inferior turbinate bone consists of Mucosa, Erectile soft tissue, Muco periosteum, Turbinate bone extending from anterior nostril to posterior choana Many blood vessels are interspersed inside the turbinate bone forming cavernous plexus making the turbinate expansile especially in anterior part[2] Submucosal or mucosal hypertrophy due to increased vascularity results in Nasal obstruction.[3] Main etiology of turbinate engorgement is because of Chronic allergic rhinitis, Vasomotor Rhinitis, Rhinitis Medicamentosa, Compensatory Hypertrophy due to long standing septal deviation to opposite side, relative hypertrophy due to narrow nasal vault.[4] Medical management for hypertrophied inferior turbinates includes drugs like antihistamines, local decongestants, steroids.[5] When medical management fails to relieve the nasal blockade, surgical treatment is indicated. At least 13 surgical techniques have been used over the past 130 years to treat hypertrophy of the inferior turbinate.[6] Crushing and Lateral Outfracturing, Cauterisation of Inferior turbinates including (a)Chemical cauterization by external application of caustics like trichloroscetic acid or phenol, (b)Internal infiltration with sclerosing agents like sodium morrhuate, (c) Surface Cauterisation with heated wire / Cautery (d) Submucosal diathermy, Cryotherapy, Laser Vapourisation, Submucous Resection of Inferior Turbinate, Partial Resection of Inferior Turbinate, Inferior Turbinoplasty (Conventional, Microdebrider, Coblation, Radiofrequency), Total Inferior Turbinectomy.[4] In Conventional Turbinoplasty medial part of inferior turbinate is preserved for airflow receptors, reduces the size of turbinate by 50% without leaving raw surface which forms crusts[7,8]

In this study we compared efficiency and post operative complications different methods of Inferior turbinate reduction

Out Fracuring This is performed by medially in fracturing the turbinate, crushing it with a flat-bladed instrument, then forcing it laterally and holding it in position temporarily with nasal packing[4]

Submucosal Diathermy performed with either unipolar or bipolar needle cautery probes. Cauterization at several sites along the inferior

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turbinate should be carried out, taking care to avoid cauterization of the conchal bone, which may result in necrosis and formation of a sequestrum[4]

Partial turbinate resection excision of the inferior edges of hyperplastic turbinates and/or removal of enlarged posterior turbinate tips[4]

Conventional turbinoplasty The technique involves elevating a mucosal-covered soft tissue flap off the medial aspect of the inferior turbinal bone, incising the insertion of the bone together with the attached inferior and lateral soft tissue and mucosa, and removing this large wedge of turbinate tissue together with the posterior tip The raw surface thus created is cauterized with a suction cautery The flap is then rolled on itself from medial to lateral and crushed laterally.[4]

MATERIALS AND METHODS

The Study is conducted in a tertiary care hospital for 2 and ½ years between 2017 january and 2019 june All the patients attending the Out patient department with chief complaint of Nasal Obstruction are examined and those with inferior turbinate hypertrophy with Severe and Extreme Grades according to NOSE (Nasal Obstruction Symptom Evaluation) scale are taken in the study.

Inclusion Criteria

1. Severe and extreme obstruction cases
2. Cases due to chronic >3 months allergy
3. Cases contributing to OSA

Exclusion Criteria

1. Atrophic rhinitis cases
2. Vasomotor rhinitis cases
3. Acute allergy less than 3 months

Methodology

Total 120 cases (Severe and Extreme) were selected, thorough clinical history was taken, evaluated by endoscopy, Obstructive symptom score by Nasal Obstruction Symptom Evaluation (NOSE) Scale NOSE Scores gives a validated disease-specific, patient-reported outcome measure for nasal obstruction which consisting of nasal congestion, nasal blockage, trouble breathing, trouble sleeping, and being unable to get enough air during exercise, each scored using a 5-point (0-4) Likert scale. The 5 item scores are summed and then multiplied by 5 to make a total score range of 0 through 100, where higher scores indicate worse obstruction symptoms. Lipan and Most developed a classification of the severity of symptoms based on the NOSE Scale score to describe mild (range, 5-25), moderate (range, 30-50), severe (range, 55-75), or extreme (range, 80-100) nasal obstruction.[9,10]

120 patients with Severe and Extreme scores combined were included in the study and were then divided into 4 groups with 30 cases each. Each group individually was treated separately by

1. Out fracturing of Inferior Turbinate
2. Submucosal cauterisation
3. Partial turbinate resection
4. Conventional turbinoplasty

Cases were performed by same surgeon in same settings to avoid inter surgeon bias. Cases were followed up for a duration of 1 year

At the end of Follow up period again scoring was done and was compared with pre operative scores

RESULTS

All the patients were followed up for 1 year and results at the end of 1 year were tabulated

Table: 1 Distribution of patients according to Age

Sl. No	Age Group(years)	Number	Percentage(%)
1	18-20	3	2.5
2	21-30	36	30
3	31-40	48	40
4	41-50	26	21.66
5	51-60	7	5.83

Majority of patients in our study belong to 31-40 years age group comprising of 40% (n=48), followed by 21-30 years - 30% (n=36), 41-50 years – 21.66 % (n=26), 51 – 60 years – 5.83% (n= 7), 18 – 20 years – 2.5 % (n = 3)

Table 2: Distribution of Patients according to Gender

Gender	Number	Percentage (%)
Male	48	40
Female	72	60

60% (n=72) of patients in our study were Females and 40 % (n=48) were males

Table 3: Distribution of Patients according to Symptom Score (NOSE)

Grade	Number	Percentage(%)
Severe (55-75)	50	50
Extreme (80-100)	50	50

50% (n=50) of patients included in our study had Severe Symptoms and 50% (n = 50) of patients had Extreme symptoms

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Table 4: Comparision of Each procedure according to Pre and Post Operative Scores at the end of 3 months and 1 year

Procedure	Pre Operative		3 Months Post Operative				1 Year Post Operative			
	Sev	Ext	Mild	Mod	Sev	Ext	Mild	Mod	Sev	Ext
Out Fracturing Of turbinate	15	15	0	0	15	15	0	0	15	15
Submucosal Diathermy	15	15	0	15	15	0	0	0	15	15
Partial Turbinate Reduction	15	15	15	15	0	0	15	15	0	0
Conventional Turbinoplasty	15	15	15	15	0	0	15	15	0	0

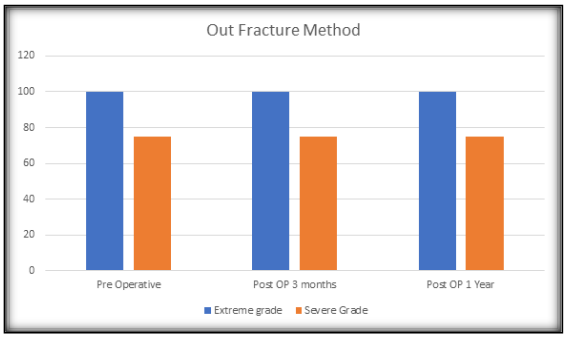
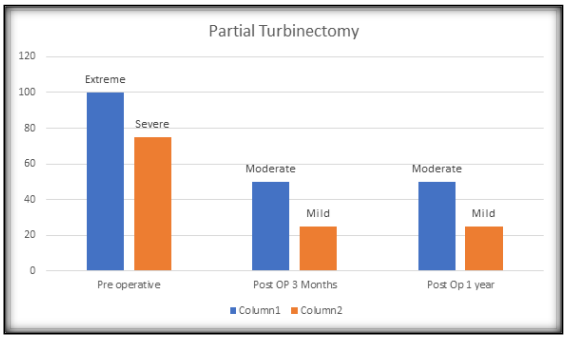


Figure 1



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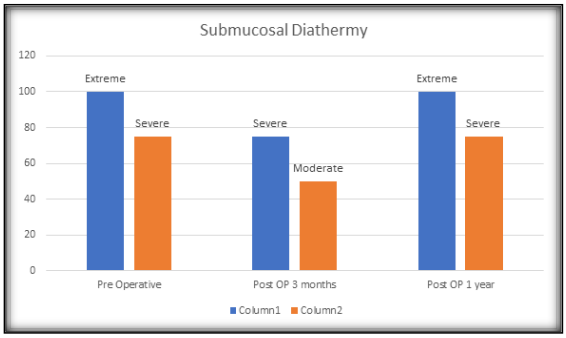

Figure 2

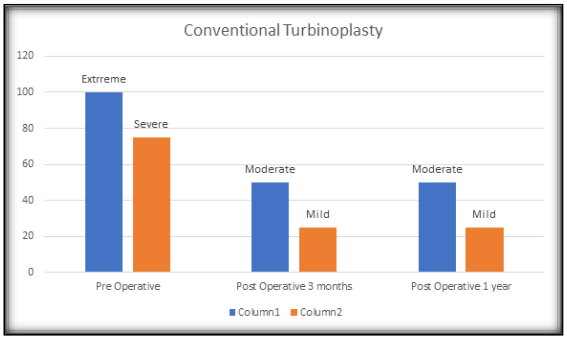

Figure 4:

Table 5: Distribution according to reduction in size of turbinate in Endoscopy

Procedure	Post Operative turbinate Size (3months)	Post Operative Size (1 year)
Out Fracturing	No change	No change
Submucosal Diathermy	Reduced by 25%	Same as Preoperative Size
Partial Turbinate Reduction	Reduced by 50%	Reduced by 50%
Conventional Turbinoplasty	Reduced by 50%	Reduced by 50%

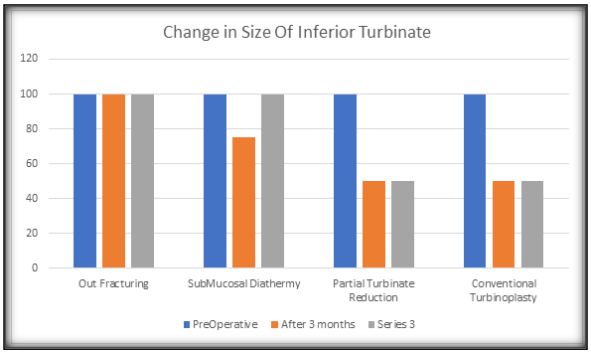

Figure 5

Table 6: Distribution according to Post Operative Complications

Complication	Outfracturing	Submucosal Diathermy	Partial Turbinate Reduction	Conventional Turbinoplasty

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Bleeding	0	0	16(53.33%)	11(36.66%)
Crusting	0	21 (70%)	23(76.6%)	4(13.33%)
Dryness of Nose	0	6(30%)	19(63.3%)	3 (10%)

At the End of One Year

In the group of patients where Out fracturing method is chosen NOS(nasal obstruction score) were the same and in Endoscopy there is no reduction in bulk of turbinate

In the group of patients where submucosal cauterization was done NOS were lesser by one grade for a duration of 3 months in all patients and Endoscopy showed reduction in bulk for 3 months following which it was as noted pre operatively Crusting was noted in 70% (n=21) and dryness of nose noted in 20% (n=6) of cases.

In the group of patients where Partial turbinectomy was done NOS was reduced significantly and Endoscopy showed reduction of size of turbinates but Crusting was noted in 76.66% (n=23) of patients and 63.33% (n=19) of patients complained of nasal dryness especially working in dry weather

In the group of patients where turbinoplasty was done NOS showed significant improvement And Endoscopy showed reduction in bulk of turbinates by 50 %. No excessive crusting (13.33%, n = 4) or drying of nose (10%, n = 3) is noted. Results were good on long term follow up after 1 year.

DISCUSSION

The main objective of our study is to reduce the size of turbinateand to create sufficient space for airway circulation Postoperatively Subjective assessment was done for nasal obstruction and was compared with pre operative scores Complications associated with these procedures are also noted

Most of the patients in our study belong to 31-40 yrs age group and females are more than males Severe and Extreme cases were equally distributed

Patients were divided into 4 groups and each group containing equal number of Severe and Extreme Grade patients Each one of the group underwent different technique

For the group who underwent Out fracturing method, at the end of 3 months and 1 year there is no change in Symptom score grading and Endoscopic assessed turbinate Size. But, no complications are associated with this procedure.

For the group who underwent Submucosal Cauterisation, at the end of 3 months, there is downgrading of Symptom Score grade but reverted to same scoring grade at the end of 1 year 70% of patients complained about crusting and 30% complained about dryness of nose post operatively

For the group who underwent Partial Turbinate Reduction, at the end of 3 months and 1 year there is downgrading of Symptom Score grading, Severe to mild and Extreme to Moderate53.33% complained about Nasal bleeding, 76.6% of patients complained about crusting and 63.33% complained about dryness of nose post operatively

For the group who underwent Conventional Turbinoplasty, at the end of 3 months and 1 year there is downgrading of Symptom Score grading, Severe to mild and Extreme to Moderate36.66% complained about Nasal bleeding, 13.33% of patients complained about crusting and 10% complained about dryness of nose post operatively

CONCLUSION

In patients who underwent Out fracturing method, immediately some relief is seen but symptoms reverted back before 3 months. This procedure is not associated with complications In patients where Submucosal Diathermy was done, relief was seen for more than 3 months but not for 1 year and is associated with minimal complications For Partial turbinate reduction procedure relief was seen for more than an year but is associated with more complications like Bleeding, Crusting and dryness of Nose. For Conventional Turbinoplasty procedure, Symptomatic relief was seen for more than an year and is associated with less complications

Hence, patients having turbinate hypertrophy will have benefit qualitatively with Conventional turbinopalsty So, In Patients who have had failed medical treatment for turbinate hypertrophy with severe and extreme symptom grades Conventional Submucosal Turbinoplasty is the best treatment modality recommended through our study

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