

A comparative study of inferior turbinoplasty with microdebrider and conventional partial turbinectomy

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Abstract

Background: Nasal Obstruction is a common symptom and affects 25% of the population. The inferior turbinate hypertrophy is the main cause of nasal obstruction. In the failure of clinical control, a surgical procedure to reduce the size of the inferior turbinate is indicated. **Objective:** Comparative study of turbinoplasty(inferior) with microdebrider and conventional partial turbinectomy. **Method:** Study of a prospective case series. 60 patients were submitted to a nasal surgery of turbinectomy or turbinoplasty in 2017-2019. The patients were followed up to 6 months of post operative period. The patients were evaluated in the following terms: postoperative, bleeding, synechiae, nasal obstruction, atrophic rhinitis and crusting in postoperative. **Results:** 60 patients attended for the evaluation. The study was statistically significant. **Discussion:** In the evaluation of the various types of surgical treatment of the inferior turbinate, literature shows similar results to our study, finding similar results between many surgical techniques in the improvement of the nasal obstruction and in mucociliary activity. **Conclusion:** The chances of post operative complications like bleeding is less in microdebrider assisted turbinoplasty but still there are chances of nasal obstruction in this surgical technique in post operative period. the follow up period should be larger than postoperative period used in this study.

Key Word: inferior turbinoplasty.

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INTRODUCTION

Inferior turbinate hypertrophy is one of the most common causes of nasal obstruction. Surgery on the inferior turbinates is reported as the eighth most common procedure performed by an otorhinolaryngologist. Inferior Turbinate is composed of conchal bone. It is a separate bone covered by lamina propria including erectile tissue and ciliated pseudo stratified columnar epithelium. Autonomic nervous system controls the congestion of inferior turbinate. Inferior turbinate hypertrophy is caused

by rhinitis of various etiology those are allergic, infective, vasomotor, hormonal or medications induced. Various techniques have been described over the cause of years. Those are inferior turbinectomy, sub-mucosal diathermy, steroid injection, inferior turbinate out fracture, cryosurgery, radiofrequency ablation, laser turbinoplasty, and coblation turbinoplasty and micro-debrider assisted turbinoplasty. Here in this study, we compare the surgical outcome of endoscopic turbinectomy and micro-debrider assisted turbinoplasty in comparison to each other.

AIMS AND OBJECTIVES

To compare the surgical results of conventional inferior turbinectomy with that of micro-debrider assisted inferior turbinoplasty. To find out the symptomatic improvement by pre-operative and post-operative clinical examination. To find out the healing process by post-operative diagnostic nasal endoscopic examination. To Compare CT Scan findings pre operatively and post operatively. To Compare X-ray findings pre operatively and post operatively.

MATERIALS AND METHODS

The study was conducted in 60 patients who attended the out-patient department of Otorhinolaryngology in The Government Medical College Kota and attached group of hospital, Kota. The study period was from Dec 2017 to March 2019.

SAMPLE SIZE: 60

FOLLOW UP PERIOD: 6 months

SELECTION CRITERIA

Age more than 20 years and less than 45 years.

Sex: Both male and female patients were considered for the study.

Patients clinically presenting with Inferior Turbinate Hypertrophy and Nasal Obstruction with or without allergic rhinitis were taken up.

Patients with ostio- meatal complex involvement were excluded from this study

Patients with previous history of nasal surgeries were excluded from this study.

After getting the informed consent duly signed, these patients were subjected to detailed systemic and ENT examinations.

PRE-OPERATIVE ASSESSMENT

X-RAY, CT PNS, ROTINE BLOOD INVESTIGATION

OBSERVATION AND RESULTS

Table 1: Distribution of patients according to their age groups

AGE Group (Years)	Microdebrider Assisted Turbinoplasty		Conventional Turbinectomy	
	FREQUENCY	PERCENT	FREQUENCY	PERCENT
Group-1 (20-30)	15	53.57%	20	62.5%
Group 2 (31-40)	11	39.28%	9	28.12%
Group 3 (41-45)	2	7.14%	3	9.37%
Total	28		32	

Table 2: Distribution of patients according to their gender

Age (Years)	Microdebrider Assisted Turbinoplasty		Conventional Turbinectomy	
	Male	Female	Male	Female
	Group 1 (20-30)	9	6	11
Group 2 (31-40)	6	5	4	5
Group 3 (41-45)	1	1	1	2
Total	16	12	16	16

Table 3: Inferior turbinate size was based on the degree of obstruction caused by the anterior aspect of the inferior turbinate relative to the total airway space and was graded as follows (In anterior rhinoscopy).

Grade	Percent	No. of Patients
Grade-1	0-25 %	0
Grade-2	26-50 %	0
Grade-3	51-75 %	20
Grade-4	76-100%	40
Total	28	60

Table 4: Patients having following CT Scan and X-Ray Finding

	CT Scan		X-ray	
	Microdebrider Assisted Turbinoplasty	Conventional Turbinectomy	Microdebrider Assisted Turbinoplasty	Conventional Turbinectomy
ITH	28	32	28	32
DNS	20	21	20	21
Paranasal Sinusitis	10	10	10	10
Concha Bullosa	4	3	0	0

Table 5

Deflection	No. of Patients
0-25 %	37
26-50 %	3
51-75%	1
76-100%	0

Table 6: No. of Patients having following complaints

Complaints	Microdebrider Assisted Turbinoplasty (No. of Patients)	Conventional Turbinectomy (No. of Patients)
Nasal Obstruction	28	32
Sneezing	20	24
Rhinorrhoea	23	20
Breathing Difficulty	28	32

Table 7: Dividation of patients according to their side of nasal obstruction

Side Distribution	Microdebrider Assisted Turbinoplasty (No. of Patients)		Conventional Turbinectomy (No. of Patients)	
	Male	Female	Male	Female
Left	5	4	3	9
Right	4	3	2	2
B/L	7	5	11	5

Table 8: Table showing time duration of post –op bleeding

Complications	Bleeding after removal of pack on 2nd post op		
	< 5 min	5-15 min	> 15 min
Convention (%)	80%	20%	0%
Endoscopic (microdebrider)	95%	5%	0%

Table 9: Post- operative findings in conventional and endoscopic (microdebrider) Groups

Post Operative	CT Scan		X-ray	
	Microdebrider Assisted Turbinoplasty	Conventional Turbinectomy	Microdebrider Assisted Turbinoplasty	Conventional Turbinectomy
ITH	0	0	0	0
DNS	20	21	20	21
Paranasal Sinusitis	1	2	1	2
Concha Bullosa	4	3	0	0

Table 10: Post-op improvement in nasal obstruction

Findings	1 Month		3 Months		6 months	
	Convention (%)	Endoscopic (microdebrider)	Convention (%)	Endoscopic (microdebrider)	Convention (%)	Endoscopic (microdebrider)
N.O.	1	1	0	1	0	1

Table 11: No. of patients having synchia in post-op period

Findings	1 Month		3 Months		6 months	
	Convention (%)	Endoscopic (microdebrider)	Convention (%)	Endoscopic (microdebrider)	Convention (%)	Endoscopic (microdebrider)
Synechia	6	0	0	0	0	0

Table 12: Post-op finding of crusting formation (Conventional vs Endoscopic)

Findings	1 Month		3 Months		6 months	
	Convention (%)	Endoscopic (microdebrider)	Convention (%)	Endoscopic (microdebrider)	Convention (%)	Endoscopic (microdebrider)
Crusting	30	0	2	0	0	0

Table 13: Development of Atrophic Rhinitis post operatively

Findings	1 Month		3 Months		6 months	
	Convention (%)	Endoscopic (microdebrider)	Convention (%)	Endoscopic (microdebrider)	Convention (%)	Endoscopic (microdebrider)
Atrophic Rhinitis	0	0	0	0	0	0

Table 14: Age and gender wise distribution of nasal obstruction after surgery

Age (Years)	Microdebrider Assisted Turbinoplasty		Conventional Turbinectomy	
	Male	Female	Male	Female
	Group 1 (20-30)	9 (9)	5 (6)	11 (11)
Group 2 (31-40)	6 (6)	5 (5)	4 (4)	5 (5)
Group 3 (41-45)	1 (1)	1 (1)	1 (1)	2 (2)
Total	0	0	0	0

Table 15: Symptoms not improved at 6 months follow up

AGE	Frequency	Percent
Group 1 (20-30yrs)	1	2.85%
Group 2 (31-40yrs)	0	0.00%
Group 3 (41-45yrs)	0	0.00%

Table 16: Comparison between outcome of Conventional Turbinectomy and Endoscopic Assisted Turbinoplasty

TECHNIQUE	SYMPTOMS	
	IMPROVED	NOT IMPROVED
INFERIOR TURBINECTOMY	32	0
INFERIOR TURBINOPLASTY	27	1

DISCUSSION AND RESULTS

Table no.1: shows division of patients in three groups according to their age who underwent microdebrider assisted turbinoplasty and conventional turbinectomy. Table no.2 : shows no. of patients taken according to their sex in which 53.33% were males(32) and 46.66% were females(28). Table no. 3 : shows degree of nasal obstruction caused by anterior aspect of inferior turbinate relative to total airway space. The study conducted by Macario Camacho, Soroush Zaghi and Robson Capasso shows that anterior aspect of inferior turbinate is directly related to degree of nasal obstruction. Table no. 4: shows CT Scan and X-RAY finding of patients who are having other deformities along with nasal obstruction. The study conducted by Kyle D. Smith,¹ Paul C. Edwards,² Tarnjit S. Saini,³ and Neil S. Norton shows that deformities like concha bullosa, paranasal sinusitis and DNS significantly contribute to the degree of nasal obstruction. According to Macario Camacho, Soroush Zaghi, and Robson Capasso : Predictors of Nasal Obstruction: Quantification and Assessment Using Multiple Grading Scales Internal nasal septal deviation was graded as 0–25% deflection, 26–50% deflection, 51–75% deflection, and 76–100% deflection (based on

deflection from midline toward the lateral wall. Table no 5: shows no. of patients of ITH with degree of deflection of nasal septum. The study conducted by C.M. Tomblinson, M.-R. Cheng, D. Lal and J.M. Hoxworth shows that ITH is directly proportional to the nasal septum deviation severity and inversely proportional to the nasal septum deviation height. Table no.6 : shows patients depending upon symptomatology. The study conducted by D. S. Deenadayal, M. Naveen kumar, and Saif Hameed shows that surgical treatment of inferior turbinate hypertrophy resulted in significantly decrease in nasal obstruction, sneezing, rhinorrhea and breathing difficulty. Table no. 7: shows that presence of inferior turbinate hypertrophy according to their side (UL right or left or BL) The study conducted by Clark DW¹, Del Signore AG, Raithatha R, Senior BA found that side of nasal obstruction (right ,left or BL) was not dependent on severity of nasal obstruction but was dependent on other anatomic factors like DNS and these had significant relation with severity of nasal obstruction. Table no.8: shows that shows post-op bleeding after removal of nasal packing. The study conducted by Ahmed M. Abdel, Fattah Mustafa I. Eid Abdel Rahman E.M. Ezzat shows significant difference in bleeding post-operatively between the

groups (done with microdebrider and conventional surgery) ($p < 0.05$). The study concluded that microdebrider assisted turbinaoplasty is the procedure of highest efficacy and less complications. Table No. 10 Shows Post Operative Nasal Obstruction in our study and the study conducted by Passali D, Lauriello M, Anselmi M, Bellussi L. shows almost same results. Table no. 11 shows post operative synechia formation. The study conducted by Hatem Bodran *et al.* did not encounter any synechia during 3 months post-op which was consistent with our study. The study by Friedman *et al.* shows that 13.95% patients had sneezing at 3 months post-op. Our study shows that 12.5% patients had sneezing at 3 months post-op. Table no.12 shows post operative crusting formation. The study conducted by Dawes PJD showed that crusting was present in 6.56% of patients and study done by Martinez *et al.* crusting was present in 7% while in our study crusting was present in 3.12% at 3 months follow up of patients who underwent turbinectomy. Table No.13 Shows post operative Atrophic Rhinitis. The study conducted by Moore GF, Freeman TJ, Ogren FP, Yonkers AJ shows same results. Table no. 14 study shows in microdebrider assisted turbinoplasty group no male out of 16 had nasal obstruction post operatively and 1 female out of 12 had nasal obstruction post operatively. In Conventional turbinectomy group there is no complain of nasal obstruction post operatively at 6 months followup . Table no. 15 shows the percentage of patients who were not relieved of their symptoms after surgery according to their age group. Table no. 16: shows efficacy of different methods opted for ITH surgery (microdebrider assisted turbinoplasty and conventional turbinectomy) The study conducted by Bhandarkar ND, Smith TL. *Outcomes of surgery for inferior turbinate hypertrophy* study conducted by Wexler D, Braverman I. shows improvement in nasal patency after surgery ($p < 0.01$) and sense of smell was improved ($p < 0.01$) without associated crusting, pain, sneezing or dryness. Postoperative bleeding was assessed at 48 hours after pack removal. We found no bleeding in cases of endoscopic group whereas there was bleeding in 20% of cases in conventional group showing statistically significant difference. All of these cases were managed by anterior nasal packing for 48 hours and required no further interventions. Bleeding has been reported from 3 to 12% in cases of inferior turbinate surgery. In case of endoscopic partial inferior turbinoplasty with microdebrider there was 95% bleeding during pack removal for less than 5 minutes, 5% bleeding between 5-15 minutes and no bleeding for more than 15 minutes. None of these cases required packing or other interventions. There was no crusting in case of endoscopic group whereas there was 60% crusting in cases of conventional group

at 1 month post op showing statistically significant difference in crusting between the two groups.

Similarly there was no crusting in case of endoscopic group at 3 months whereas there was 4% crusting in cases of conventional group showing no significant difference. Crusting was reduced with nasal douching. Most of the authors have reported crusting in inferior turbinate surgery from 0% to 13%. In endoscopic PIT, 60% of cases had mild amount of crusting in immediate post op period which resolved by 3rd week. At 6 months follow up there was no crusting seen in these cases. There was no synechia in case of endoscopic group whereas there was 12% synechia seen in cases of conventional group at 1 month showing statistically significant difference in synechia seen in these two procedures. Similarly there was no synechia in case of endoscopic group whereas there was 2% synechia seen in cases of conventional group at 3 months showing no significant difference. The synechia was released in OPD and a x ray film was placed for 5 days to prevent further synechia. 3-4.4% synechia has been reported in the literature by various authors. In case of endoscopic partial inferior turbinoplasty 10% mild asymptomatic synechia which resolved without any complications. There was no synechia seen in these cases at 3 months follow up. Nasal discharge and foetor was absent in both the groups in our study. 5-39% of nasal discharge has been observed in other series in the past literatures in inferior turbinate surgery. In case of endoscopic partial inferior turbinoplasty no incidences of these complications.

SUMMARY AND CONCLUSION

This prospective study was conducted totally in 60 patients. 30 out of 60 underwent inferior turbinectomy in which 25 patients (95%) recovered completely without any symptoms at the end of 6 months of follow up. 5 patients had mild nasal obstruction and dryness of nose. Inferior turbinoplasty was done in 30 patients of whom 28 (98%) completely recovered. Only 2 patients had edema of mucosa and rhinitis till the end of 6 months of post-operative follow up. The Corrected p - value between the two techniques is 0.1316499067 which is greater than 0.05 and hence the difference between them is not significant. But when comparing the clinical status post operatively, Inferior turbinoplasty can be considered in the place of inferior turbinectomy. Hence keeping an eye on the above mentioned anatomy, physiology of inferior turbinate, thereby the functional importance and significance of inferior turbinate so as keeping the remaining mucosa of inferior turbinate is good for future outcome as well as good nasal function and better quality of life.

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