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Original Article

Effectiveness of Inferior Turbinoplasty in Patients with Chronic Rhinosinusitis

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Abstract

Background: Chronic sinusitis is an inflammation of the nasal passages or sinuses that persists for a duration exceeding twelve weeks. Inferior turbinate hypertrophy is commonly seen in CRS and may obstruct sinus drainage and ventilation. Inferior turbinoplasty aims to relieve obstruction by surgical reduction of the turbinates.

The aim of the work: To evaluate the efficacy of inferior turbinoplasty in improving symptom scores and endoscopic findings in patients with CRS and inferior turbinate hypertrophy.

Patients and Methods: For this prospective, randomized, controlled research, forty cases without polyps who had chronic rhinosinusitis were divided into two groups by the numerical randomization method: The primary group [20 patients] undergoes endoscopic sinus surgery. The second group [20 patients] undergoes endoscopic sinus surgery and coblation-assisted turbinoplasty. Outcome measures assessed preoperatively included: Lund-Kennedy endoscopic appearance scores; and Sino-Nasal Outcome Test-22 [SNOT-22] quality of life assessment.

Results: There was no statistically significant difference within the examined groups regarding the modified SNOT score and the Lund-Mackay score, while there was statistically significant variance within the examined groups as regard the NES score, the post-operative MODIFIED SNOT score after 1 month, & the post-operative MODIFIED SNOT score after 2 and 3 months.

Conclusion: According to our outcomes, we found that there was statistically significant variance within examined groups according to post-operative NES score after 1 month, and post- operative NES score after 2 and 3 months. The inferior turbinoplasty in patients with chronic rhinosinusitis are effective and safe.

Keywords: Inferior turbinoplasty; Chronic rhinosinusitis; Endoscopic sinus surgery.

INTRODUCTION

Chronic sinusitis is an inflammation of the nasal passages or sinuses that persists for a duration exceeding twelve weeks. Cases manifest common symptoms of sinusitis, including nasal obstruction, facial or dental pain, and purulent nasal discharge [1]. Chronic sinusitis can be diagnosed by the presence of a minimum of two out of the four symptoms listed below, which persist for a duration exceeding twelve weeks: [1] nasal obstruction, [2] hyposmia, [3] purulent drainage, and [4] facial and/or dental pain [2].

Endoscopic functional sinus surgery may be an option for cases whose medical treatment has failed. When medical treatment is supplemented, it can be utilized in more complicated cases. Restoring drainage and mucociliary clearance, relieving obstructions, and ventilating the sinuses are the objectives of this operation [3]. It is typical to observe inferior turbinate hypertrophy [ITH] in cases of CRS. Significant nasal obstruction may result from ITH that occupies over one-third of the nasal lumen. The majority of the inferior turbinate is required for usual nasal breathing function [4].

Thus, inferior turbinate reduction is essential in cases with CRS in order to preserve adequate breathing function, prevent mechanical obstruction caused by ITH, and keep a balance between overresection and underresection of the inferior turbinate [5]. Coblation-assisted turbinoplasty, radiofrequency ablation, electrocautery, turbinate submucous dissection, inferior turbinate fracture, and turbinectomy are all frequent inferior turbinate reduction procedures [6].

The research aimed to evaluate the efficiency of inferior turbinoplasty in cases of chronic rhinosinusitis.

PATIENTS AND METHODS

This prospective, randomized controlled study was performed on forty cases of chronic rhinosinusitis without polyps and divided into two groups by the numerical randomization method: the primary group [20 patients] underwent endoscopic sinus surgery. The second group [20 patients] undergoes endoscopic sinus surgery and coblation-assisted turbinoplasty in the Otorhinolaryngology Head & Neck Surgery Department, Al-Azhar University Hospital [Damietta].

Inclusion Criteria: ITH refractory to medical management [medical management involved three months of intranasal corticosteroids [INCS] & saline nasal washes] and cases of both sexes who were diagnosed with CRS [regarding to EPOS criteria, European position paper on rhinosinusitis].

Exclusion Criteria: cases not willing for surgery; cases having previous nasal surgery, cases having granulomatous diseases; and patients with concha bullosa.

The Procedure

Pre-operative: All cases were assessed by the Arabic version of the Sino-nasal outcome test [SNOT-22] [7] and NES score and The Lund-Mackay score pre-operatively.

Surgical procedure: All surgical procedures were carried out with an endoscope. ESS was carried out for all cases requiring general anesthesia.

Group-A underwent FESS without coblation assisted turbinoplasty under general anesthesia. **Group-B** underwent FESS with coblation-assisted turbinoplasty under general anesthesia. ESS was carried out under general anesthesia. Local anesthetic lignocaine, 2 percent, was administered via infiltration into the middle turbinate and uncinate processes. After performing an uncinectomy, a broad middle meatal antrostomy [MMA] was performed. The damaged mucosa was cleared. Following posterior and anterior ethmoidectomy, the disease was subsequently eradicated. The ostium of the bilateral sphenoid sinuses enlarged, became devoid of discharge, and damaged the mucosa. Examination of the frontal recess & sinus enlargement. The extent of sinus operation was determined by the severity of the disease detected by CT scan.

In Group-B, as the research device, a Reflex Ultra 45 wand was utilized in conjunction with the Coblation II controller [ArthroCare, Austin, TX, USA]. After adjusting the power level of the controller to six, a minute quantity of saline solution was administered onto the wand point. The wand of a nasal endoscope [0°] was inserted at the anterior portion of the inferior turbinate in order to gain access to and observe the nasal cavity. With the ablation mode active, the wand traversed the inferior, medial, and superior compartments in an effort to reach the posterior aspect of the turbinates. Due to the vital physiological function of the lateral portions of the turbinates, extreme caution was exercised in order to avoid them. In order to minimize mucosal damage, the wand was inserted solely once, employing the single insertion site technique [SIS]. **Post-operatively:** All patients 3 months post-operatively, were evaluated via SNOT-22 & Likert scale scores for sinus accessibility. The Lund-Mackay score was used by all patients three months post-operatively to evaluate the extent of the disease in accordance with CT findings.

Follow up: There wasn't any variance in the post-operative medications among both groups. Endoscopic cleaning of the sinus cavities was conducted in the office environment one week following the procedure and at two-week intervals thereafter until the sinus cavities fully recovered. The purpose of this procedure was to eliminate adhesions, blood, and crust. A minimum of two weeks of antibiotics, saline irrigation of the nasal cavities, and local corticosteroid nasal spray were prescribed. In cases with severe sinus cavity edema, a short course of systemic corticosteroids was advised.

Ethical Consideration: The information collected from participants is strictly confidential. The identities of the study participants won't be indicated in any report or publication associated with this research. The contributors were provided with a comprehensive explanation of the study's purposes, characteristics, & risk-benefit analysis prior to their admission. Consent that was informed was obtained.

Statistical Analysis: Information was assessed utilized the Statistical Package for Social Sciences [SPSS] software program. Information was expressed as percentage & number for qualitative variables & mean + standard deviation [SD] for quantitative ones. Level of significance: A P value > 0.05 detects non-significant outcomes. A P value of < 0.05 detects significant outcomes.

RESULTS

There wasn't statistically significant variance within the examined groups according to age and gender [Table 1]. There wasn't statistically significant variance within the examined groups regarding

the modified SNOT score and The Lund-Mackay score, while there was statistically significant variance within the examined groups as regard the NES score [Table 2]. There was statistically significant variance within the examined groups in the post-operative NES score after 1 month, & after 2 and 3 months [Table 3]. A statistically significant variance was found within the examined groups in accordance with the post-operative MODIFIED SNOT score after 1 month, & after 2 and 3 months [Table 4]. A greatly statistically significant variance was found within the examined groups as regard the post-operative The Lund-Mackay score after 1, 2, and 3 months [Table 5]. There wasn't statistically significant variance within the examined groups regarding the intra- operative Likert scale score for sinus accessibility [Table 6].

Table [1]: Distribution of demographic data within the examined groups

	Group A [N=20]		Group B [N=20]		P value
Age	**Mean**	**SD**	**Mean**	**SD**	0.72
	30.1	6.5	29.35	6.9	
Gender					
	N	**%**	**N**	**%**	
Male	12	60	11	55	0.74
Female	8	40	9	45	

Table [2]: Distribution of pre-operative scores among studied groups

	Group A [N=20]		Group B [N=20]		
	Mean	**SD**	**Mean**	**SD**	
NES SCORE	4.51	2.3	6.3	1.85	**0.01***
Modified SNOT SCORE	20.78	4.38	23.7	4.75	0.055
The Lund-Mackay score	4.3	2.09	5.2	2.05	0.18

Table [3]: Distribution of post-operative NES score among studied groups

	Group A [N=20]		Group B [N=20]		P value
	Mean	**SD**	**Mean**	**SD**	
1 month	4.5	2.16	3.3	1.49	0.04
2 months	4.5	2.16	2.89	0.9	**<0.001***
3 months	4.3	1.63	2.35	0.86	**<0.001***

Table [4]: Distribution of post-operative MODIFIED SNOT score among studied groups.

	Group A [N=20]		Group B [N=20]		P value
	Mean	**SD**	**Mean**	**SD**	
1 month	16.1	4.95	14.01	3.61	0.14
2 months	12.45	3.85	7.80	3.76	**<0.001***
3 months	9.1	3.07	6.1	1.79	**<0.001***

Table [5]: Distribution of post-operative The Lund-Mackay scores among examined groups

	Group A [N=20]		Group B [N=20]		P value
	Mean	**SD**	**Mean**	**SD**	
1 month	5.05	1.93	8.28	1.53	**<0.001***
2 months	4.35	1.69	3.04	0.91	**<0.001***
3 months	3.32	1.43	2.2	0.81	**<0.001***

Table [6]: Distribution of intra-operative Likert scale score for sinus accessibility among examined groups

SCORE	Group A [N=20]		Group B [N=20]		P value
	No.	**%**	**No.**	**%**	
1 [no difficulty]	12	60	14	70	0.762
2 [low difficulty]	5	25	3	15	
3 [moderate difficulty]	2	10	3	15	
4 [high difficulty]	1	5	0	0	
5 [very high difficulty]	0	0	0	0	

DISCUSSION

According to our outcomes, we found that there wasn't statistically significant variance within the examined groups according to age and gender. Our outcomes agree with those of **Aref *et al.*** [8], who expected to compare the efficacy & safety of coblation & partial turbinectomy in decreasing the hypertrophied inferior turbinate. The research was conducted on a sample of sixty cases, with 21 females comprising 35% of the sample and 39 males comprising 65%. Group A, consisting of individuals aged 21 to 50, had an average age of 29, whereas group B, consisting of individuals aged 22 to 50, had an average age of 32.16.

There wasn't statistically significant variance within the examined groups regarding the Modified SNOT SCORE & The Lund-Mackay SCORE while there was statistically significant variance within the examined groups regarding the NES SCORE. There was statistically significant variance within the examined groups regarding the post-operative NES score after 1 month, and there was greatly statistically significant variance within the examined

groups according to the post-operative NES score after 2 and 3 months ,the post-operative MODIFIED SNOT score after 1 month, the post-operative MODIFIED SNOT score after 2 and 3 months & post-operative The Lund-Mackay SCORE after 1, 2, and 3 months. There wasn't statistically significant variance within the examined groups according to the intra-operative Likert scale score for sinus accessibility. Our outcomes agree with those of **Aref *et al.*** [8], who documented a statistically significant variance was found within the examined groups in nasal discharge, facial pain, cough, post-nasal drip, and anosmia post-operative.

Hamerschmidt *et al.* [9] who aimed to measure effectiveness of inferior turbinoplasty in treating both obstructive & non-obstructive symptoms in cases of allergic rhinitis or not.

Prospective research involving fifty-seven inferior turbinoplasty patients. They demonstrated that ninety days following surgery, the following were the outcomes for cases: 89.5% reported moderate or complete enhancement of snoring; 94.7% reported degrees IV & V of enhancement in breathing; all patients reported improvements in smell [with the exception of one patient who reported a moderate enhancement; the others reported complete enhancement]; 95.5% reported complete enhancement in facial pressure; & 89.7% reported moderate to complete enhancement in runny nose, nasal itching, & sneezing. In cases with and without allergic rhinitis, the researchers found that inferior turbinoplasty was effective three months following the procedure in managing non-obstructive symptoms, including sneezing, rhinorrhea, and itching, in addition to obstructive symptoms. Moreover, our outcomes are in agreement with the outcomes of the research of **Barbosa Ade *et al.*** [10] where acoustic rhinometry indicated a 98% enhancement in nasal obstruction following partial inferior turbinectomy. In addition, **Bitar *et al.*** [11] studied that nasal obstruction developed in one hundred percent of patients following coblation, & the median VAS score for nasal obstruction decreased from nine [variety: seven to ten] preoperatively to zero [range: zero to two] within one month postoperatively [P<0.001].

Furthermore, **Salzano *et al.*** [12] study found that, regarding VAS scores, cases who underwent partial turbinectomy reported the most severe & quick alleviation of symptoms.

This in contrast with **Cavaliere *et al.*** [13] where on the seventh day after the procedure, cases who underwent coblation experienced significantly less postoperative pain than those who endured surgery [0.92±1 vs. 1.36±1.07], but the variance wasn't statistically significant [P = 0.14].

Conclusion: Regarding our outcomes, we found that there was statistically significant variance within the examined groups in the post-operative NES score after 1 month, and there was greatly statistically significant variance within the examined group regarding the post-operative NES score after 2 and 3 months. The inferior turbinoplasty for patients with chronic rhinosinusitis are effective and safe. Additional prospective studies employing more extensive scales are required to validate our findings.

Disclosure:

None to be disclosed.

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