

Endoscopic Partial Lateral Middle Turbinectomy versus middle Turbinat Trimming in Adult patients with Concha Bullosa

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Abstract:

Background: Concha bullosa is an anatomical variation which defined by pneumatization of middle turbinate that occurred with an incidence of (5 to 25%) in the normal population. It has the potential to cause crowding and obstruction of the middle meatus and nasal cavity. There are many surgical techniques which utilized for its management. **Study goal:** Is to compare the formation of adhesion between *endoscopic partial lateral middle turbinectomy* and *middle turbinate trimming* in cases of concha bullosa. **Patients and methods:** A prospective comparative clinical trial was performed in the ENT department at Al-Shahid Ghazi AL Hariri Hospital in Medical City over the period from September 2016 to August 2017. Fifty nine (59) patients {24 males & 35 females} complained from long-standing history of unilateral or bilateral nasal obstruction (without signs of allergy, nasal polyps or masses) was included in this study. CT scan of nose and para-nasal sinuses revealed twenty one (21) patients had unilateral concha bullosa while thirty eight (38) of them had bilateral concha bullosa. The patients were divided randomly, into two groups regarding the type of endoscopic surgical management of concha bullosa (*partial lateral middle turbinectomy* versus *trimming of middle turbinate*). Patients were followed-up every 2 weeks for three months postoperatively (subjective assessment of the nasal airway patency and endoscopic nasal examination looking for any adhesion to lateral nasal wall). **Results:** The percentage of adhesion was (23.4%) in partial lateral middle turbinectomy and was (8%) in trimming of middle turbinate while the relief of nasal obstruction was (96.8%) after middle turbinate trimming and was (82.1%) after partial lateral middle turbinectomy. **Conclusions:** The adhesion was more statistically significant in partial lateral middle turbinectomy than middle turbinate trimming with (P value = 0.036) and the nasal airway patency improvement was more statistically significant after middle turbinate trimming than partial lateral middle turbinectomy with (P value = 0.027).

Key words: Concha bullosa, partial lateral middle turbinectomy, middle turbinate trimming

How to cite this article: Ahmed AS, Rasheed AM (2020): Endoscopic partial lateral middle turbinectomy versus middle turbinate trimming in adult patients with concha bullosa, *Ann Trop Med & Public Health*; 23(S24): SP232429. DOI: <http://doi.org/10.36295/ASRO.2020.232429>

Introduction

Concha bullosa (CB) is defined as pneumatized middle turbinate (MT), it occurs in about 5-25% of normal population. CB may cause obstruction of the middle meatus and nasal cavity which can adversely affect ventilation and mucociliary clearance of the maxillary, anterior ethmoid and frontal sinuses⁽¹⁾.

There are 3 kinds of CB according to the degree and localization of pneumatization: lamellar, bulbous and extensive⁽²⁾ CB surgery is indicated : to relieve nasal obstruction, to provide access to osteomeatal complex, to treat middle meatus obstruction syndrome and to clear infection of the CB.⁽³⁾

There are various surgical methods which had been used to treat CB, these surgical techniques include: lateral marsupialization, medial marsupialization, crushing, transverse excision and conchoplasty.^(4,5,6) Each surgical technique has its own advantages and disadvantages. One of the important complications of MT surgery, especially when accompanied by endoscopic sinus surgery, is synechia formation which subsequently can cause nasal obstruction, obstruction of osteomeatal complex, frontal recess obstruction, headache and olfactory dysfunction.⁽⁷⁾

The aim of our study is to evaluate the synechia formation between partial lateral middle turbinectomy (PLMT) and middle turbinate trimming (MTT) in patients with CB and chronic sinusitis.

Patients and methods

An approved of the ethics committee in the Baghdad Medical College was obtained; written consents were taken from all the patients to participate in this study after explanation of the risks of general anesthesia and complications of surgery.

This is a prospective comparative clinical trial was performed in the otolaryngology ,department at Al-jerहत, Teaching Hospital in Medical City, Baghdad, Iraq, over the period from July 2016 through October 2018.

The patients included in this study were presented with long standing history of nasal obstruction, snoring, nasal discharge, headache and/or anosmia. Routine history and clinical examination have done involving rigid nasal endoscopic examination (0 degree, 4 mm diameter, 18 mm length) under local anesthesia which revealed unilateral or bilateral MT enlargement with signs of chronic rhino sinusitis , all the patients were sent for CT scan of the nose and Para nasal sinuses (coronal and axial views). The total number of the patients enrolled in the current study was 59 patients (24 males and 35 females) who fit the inclusion criteria which are CB (bulbous and extensive types) and concomitant chronic rhino sinusitis.

The patients were allocated into two groups depending on the sort of endoscopic surgical management of CB. Group A patients (28 patients) were subjected to PLMT, while patients in group B (31 patients) were treated by MTT. Endoscopic sinus surgery for chronic rhino

sinusitis (uncinectomy, middle meatal antrostomy with or without ethmoidectomy) was done in patients in both groups.

Exclusion criteria include patients with: previous nasal and paranasal sinuses surgery, severe-impacted septal deviation, inferior turbinate enlargement that needs surgical intervention and those with nasal mass. Pregnant females, patients with bleeding tendency, patients unfit for general anesthesia and those who refused surgery were also excluded from this study.

Surgical Methodology

Under general anesthesia with oral endotracheal intubation and throat pack in reverse trendelenburg position. With endoscopic guidance (0 degree, 4 mm diameter, 180 mm length) and camera display system, a pledgets soaked with xylometazoline 0.1% were inserted in the middle meatus and around the MT.

In PLMT, a sickle knife was used to make a vertical incision in the CB with continuation of the incision along the inferior margin of the MT to the lateral insertion in the lateral nasal wall, then by using of a micro scissor to continue the superior incision posterior as high by progressively moving inferiorly as the posterior region of the MT and once the lateral lamella of the turbinate had been resected, it was removed with mucosa.

The method of MTT was done by using micro scissor to cut the lower one third of the MT and resect it with mucosa.

Endoscopic sinus surgery which included uncinectomy, middle meatal antrostomy with or without ethmoidectomy was done in all patients.

After completion of the procedure, a middle meatal and anterior nasal merocel packs were inserted and left for 48 hours. The patients were discharged from the hospital after 2 days on oral antibiotic and sodium bicarbonate nasal douche for 10 days. The follow-up of the patients was achieved at the first post-operative week, second post-operative week and then every 2 weeks for 3 months. In each visit an endoscopic nasal examination was done to assess the formation of synechia.

Statistical Analysis

The data had been managed and analyzed with computer software SPSS version 24. Chi square test used to define the association between the categorical variables, a confidence level of 95% with P value less than 0.05 was considered significant.

Results

The patients ages ranged from 18-50 years (mean age = 27.3 years and standard deviation +/- 9.64 years), thirty five patients (59%) were females and 24 (41%) patients were males. Table (1) shows the age and gender distribution.

Table (1): Age and gender distribution

Age(year s)	Group A		Group B		Total Number & %
	Female Number & %	Male Number & %	Female Number & %	Male Number & %	
18-20	4(6.78%)	1(1.69%)	3(5.08%)	2(3.39%)	10 (16.9%)
21-30	7(11.86%)	4(6.78%)	8(13.56%)	6(10.17%)	25 (42.4%)
31-40	3(5.08%)	4(6.78%)	5(8.47%)	4(6.78%)	16 (27.1%)
41-50	3(5.08%)	2(3.39%)	2(3.39%)	1(1.69%)	8 (13.6%)
Total	17(28.8%)	11(18.6%)	18(30.5%)	13(22.1%)	59(100%)

Nasal obstruction was the main presenting symptom in all patients (100%), other associated symptoms are shown in table (2).

Table (2): The associated symptoms

Symptoms	Number of patients & percentage
Snoring	(88.73%) 63
Sneezing	(83.09%) 59
Rhinorrhoea	(66.19%) 47
Headache	(26.76%) 19
Anosmia	(15.49%) 11

In the current study, extensive concha bullosa was found in 57.7% of cases while bulbous type was seen in 42.3% of patients. Bilateral concha bullosa (64.4%) was more common than unilateral concha bullosa (35,6%). Table (3) shows the frequency distribution according to the side of concha bullosa.

Table (3) : Frequency distribution according to the side of the concha bullosa								
Group	Right	%	Left	%	Bilateral	%	Total	%
<i>Group I</i> (<i>partial lateral middle</i> <i>turbinectomy</i>)	5	8.4	4	6.8	19	32.2	28	47.4
<i>Group II</i> (<i>trimming of the middle</i> <i>turbinate</i>)	6	10.2	6	10.2	19	32.2	31	52.6
<i>Total</i>	11	18.6	10	17	38	64.4	59	100

The distribution of the sample according to the type of operation is shown in table (4).

Table (4) : Distribution of the sample according to the type of operation				
Group	Number of the patients	%	Number of the conchae	%
<i>Group I</i> (<i>partial lateral middle</i> <i>turbinectomy</i>)	28	47.4	47	48.4
<i>Group II</i> (<i>trimming of the middle</i> <i>turbinate</i>)	31	52.6	50	51.6
<i>Total</i>	59	100	97	100

Intergroup comparison had shown that the occurrence of adhesion was statistically more significant in group I than group II (P value = 0.036) after 3 months of the operation as shown in table (5).

Table (5): Relationship between the operation type and adhesion at the end of the third post-operative month					
			Adhesion		Total
			Yes	No	
Operation group	I	Number of the conchae	11	36	47
		%	23.4	76.6	100
	II	Number of the conchae	4	46	50
		%	8	92	100
Statistics		$X^2 = 4.398$ Degree of freedom = 1 $P = 0.036^*$			

The occurrence of adhesions in group I and group II at the end of the third post-operative month are shown in figure (1) and figure (2) respectively.

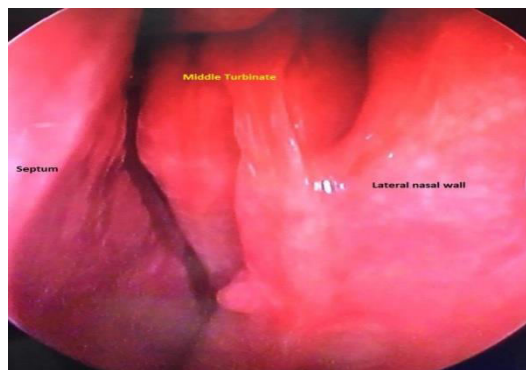


Figure (1) : Endoscopic examination after partial lateral middle turbinectomy (group I) which revealed adhesion at the end of the 3rd post—operative month.

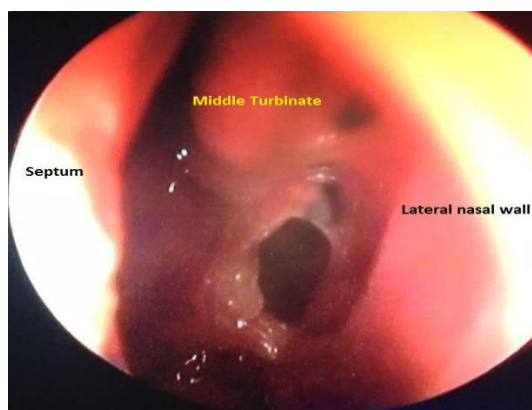


Figure (2) : Endoscopic examination after trimming of the middle turbinate (group II) which revealed adhesion at the end of the 3^{ed} post-operative month.

Discussion

The present study had compared between two endoscopic surgical techniques used in treatment of concha bullosa (PLMT and MTT) regarding the formation of adhesion. Since concha bullosa is one of the anatomical variations that can predispose to chronic rhinosinusitis, so concomitant surgery of concha bullosa and paranasal sinuses is not uncommon which, subsequently, can result in increasing the incidence of intranasal adhesions.

This study had shown that the occurrence of adhesion was statistically more significant in patients underwent PLMT than patients subjected to MTT with concomitant ipsilateral endoscopic sinus surgery (P value + 0.036). Perhaps, this result can be attributed to the creation of two raw opposed surfaces in PLMT with concomitant ipsilateral endoscopic surgery leading to increased incidence of adhesion to the lateral nasal wall, while in MTT the raw surfaces of the middle turbinate and middle meatus were not facing each other.

Sigston EA et al, described that the adhesion was a common complication of PLMT because the abraded middle turbinate remnant facing the lateral nasal wall ⁽¹⁾. Development of adhesion after PLMT was reported in the literatures ranging from 7.8% to 27% ^(2,8,9,10). Wigand ME, Lazar RH, Rice DH and Schaefer SD, stated that the adhesion may form in up to 15% of patients who had PLMT especially when uncinectomy and ethmoidectomy were done at the same time because of a raw surface area which face the ostio-meatal complex ^(11,12,13).

May M et al, mentioned that there was significant reduction in the incidence of adhesion following resection of the inferior third of the middle turbinate by avoiding creation of raw surface area on the sides of middle meatus ^(14,15). Havas TE and Vleming M et al, reported that synechia did not develop after resection of inferior third of the middle turbinate, but other literatures mentioned that the incidence of adhesion ranging between 5% and 16% ^(16,17,18,19,20,21).

However, resection of the lower third of the middle turbinate, in addition for reducing the synechia formation, allow better access for endoscopic sinus surgery.

Conclusions

Intranasal adhesion is one of the complications of nasal surgery especially when surgery is performed on more than one part of the nasal cavity. Our study had shown that the formation of adhesion was statistically more significant in patients who were treated with endoscopic PLMT rather than the patients who subjected to MTT when endoscopic sinus surgery was performed concomitantly.

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