ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 11, Issue, 04, pp.3049-3053, April, 2019

DOI: https://doi.org/10.24941/ijcr.34817.04.2019

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

EFFECTS OF MEDIALIZATION METHOD OF MIDDLE TURBINATE IN FUNCTIONAL ENDOSCOPIC SINUSES SURGERY

***Dr. Mohammed Ibrahim Yaseen and Dr. Saad Shyaa Jasim**

ENT Specialist Surgeon lraq, Baghdad / Iraq

ARTICLE INFO

Article History:

Received 24th January, 2019
Received in revised form
16th February, 2019
Accepted 19th March, 2019
Published online 30th April, 2019

Key Words:

Sinuses, Medicalization, Turbinate.

ABSTRACT

Background: In revolution of functional endoscopic sinus surgery we need to found out new approaches to reduce recurrence after operation, and middle turbinate medialization is important step in this purpose. So we focus on some types of medialization like nothing or conchopexy and bolgraization. **Objectives:** To find out the effects of different types of middle turbinate medicalization in fess. **Patients and methods:** Comparative cross sectional study focus on middle turbinate medicalization in patients underwent fess operation in Al-Yarmook teaching hospital in a period between March 2017 to June 2018 in determined days in a week. Thirty six patients included in our study . after taking history and routine otolaryngological examinations were done and sent for imaging if needed . and when fess operation needed the patient included in the study. We collect the data in three categories , patients without middle turbinate medicalization, and patient with cocopexy i.e suturing of middle turbinate to septum ,and patient with bolgeraization which mean cross hatch of both septum and middle turbinate, and made the categories as time of operation , patient nasal patency , infection , adhesion in day one and after 1week and after 2weeks and after 1month and 3months and 6months. **Results:** In medialization by freer elevator male percentage is 58.33% to female 41.66%, and, 50% recurrence of sinusitis but no time spend. In medialization by conchopexy 25% are males and 75% females. and 16.6% sinusitis recurrence .and the extra time to operation is about 13 min. In medialization by bolgraization 66.66% were males and 33.33% females, and the sinusitis recurrence is 8.3%, the additional time is about 4 min.

Conclusion

- Females prefer less intervention technique in medicalization of middle turbinate
- Boligraztion is the best result of medialzation type of middle turbinate. by less time consuming in comparison with cochopexy , and less recurrence

Recommendations

- Its better to do medicalization of middle turbinate in FESS surgery.
- Bolgiraization is the best type of middle turbinate medialization.
- The subject need further researches and studies about another types of medialization like by laser and harmonic and bipolar and others.

***Citation: Dr. Mohammed Ibrahim Yaseen and Dr. Saad Shyaa Jasim,* 2019.** "Effects of medialization method of middle turbinate in functional endoscopic sinuses surgery", *International Journal of Current Research*, 11, (04), 3049-3053.

INTRODUCTION

Nasal cavity[1]

The nasal cavity extends from the external nares to the posterior choanae, where it becomes continuous with the nasopharynx. The nasal cavity is divided into two passage ways by the nasal septum. Each side consists of a floor, roof, lateral and medial (septum) wall. The nasal floor is concave from side to side, flat anteroposteriorly and horizontally oriented. The anterior three-quarters are comprised of the palatine process of the maxilla and the posterior one-quarter by the horizontal process of the palatine bone. Approximately 12 mm behind the anterior aspect of the nasal floor is a slight depression which corresponds to the incisive canal. The incisive canal contains terminal branches of the nasopalatine nerve and greater palatine artery. The roof of the nasal cavity is formed by the skull base and slopes downward anteroposteriorly This is important to recognize during endoscopic sinus surgery as dissection progresses posteriorly towards the sphenoid sinus. The superior aspect of the nasal cavity including the superior septum, superior turbinate and upper aspect of the middle turbinate is lined by olfactory epithelium. With the exception of the vestibule, the remainder

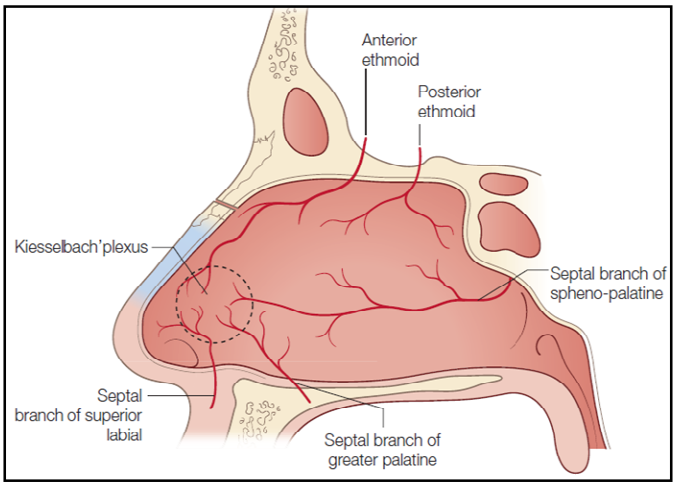
[1]) Dustin M. Dalgorf and Richard J. Harvey. Anatomy of Nose and Paranasal Sinuses, in: John C Watkinson and Raymond W Clarke, *Scott-Brawn's Otorhinolaryngology, Head and Neck Surgery*, 8th, Taylo & Francis Group, LLC. 2018; vol 2, P. 966.

of the nasal cavity is lined by respiratory epithelium. The respiratory epithelium of the nasal cavity is continuous with the mucosal lining of the entire upper and lower airway system.

Nerve supply of nasal mucosa[1] : Innervation of the nasal mucosa includes both autonomic and sensory components. The autonomic nervous system regulates the degree of vascular tone, turbinate congestion and nasal secretions present in the nose. Nasal secretion is regulated by the parasympathetic nervous system. Presynaptic parasympathetic fibers travel along the vidian nerve (contribution from the greater superficial petrosal (parasympathetic) and deep petrosal (sympathetic) nerves) and synapse within the sphenopalatine ganglion to innervate the nasal mucosa via postsynaptic fibers. Vascular tone and turbinate congestion is regulated by the sympathetic nervous system. Post-synaptic sympathetic fibers pass through the sphenopalatine ganglion and terminate in the nasal mucosa. The ophthalmic and maxillary divisions of the trigeminal nerve provide the sensory innervationto the nasal mucosa. Trigeminal nerve fibers also pass through the sphenopalatine ganglion and transmit sensations of pain, temperature and touch. The lateral wall of the nose and turbinates are supplied by the posterolateral nasal nerves from V2 arising from the sphenopalatine foramen and the ethmoidal nerves arising from V1 Although an artery supplies the inferior turbinate posteriorly, the neural innervation is from the lateral wall nerves continuing caudally.

Nasal septum [1]: The nasal septum serves many functions, including separation of the nasal airway into two nasal cavities, support of the nasal dorsum, and maintenance of the nasal tip and forms part of the nasal valves. Deviation of the nasal septum can lead to significant nasal airway obstruction and cosmetic deformity. The nasal septum consists of a bony, cartilaginous and membranous portion .The bony portion is comprised of the perpendicular plate of the ethmoid bone, vomer, maxillary crest and palatine bone .The perpendicular plate of the ethmoid forms the upper one-third of the nasal septum. It is continuous superiorly with the cribriform plate and crista galli and abuts a variable amount of the nasal and frontal bones. Posteriorly the perpendicular plate articulates with the sphenoid crest, posteroinferiorly with the vomer and anteroinferiorly with the septal cartilage. The vomer forms the posterior and inferior nasal septum and articulates by its two alae with the sphenoid rostrum creating the vomerovaginal canals through which the pharyngeal branches of the maxillary artery travel. The inferior border of the vomer articulates with the nasal crest formed by the maxillary and palatine bones. The anterior border articulates with the septal cartilage and the posterior edge of the vomer forms the posterior free edge of the septum. The cartilaginous portion of the nasal septum is composed of the septal or quadrilateral cartilage .The quadrilateral cartilage is bound firmly by collagenous fibers to the nasal bones, perpendicular plate of the ethmoid and vomer. The septal cartilage is continuous with the upper lateral cartilages towards the bridge of the nose. A projection of the septal cartilage called the sphenoidal process or septal tail extends posteriorly between the vomer and perpendicular plate of the ethmoid. The septal tail can serve as an additional source of cartilage to harvest especially during revision rhinoplasty. The inferior attachment sits within the nasal crest of the maxilla and is bound by looser connective tissue creating a pseudoarthrosis. This joint allows mobility of the septal cartilage base during flexion thereby reducing the risk of fracture or dislocation with trauma. The membranous septum is a segment of connective tissue between the caudal portion of the septal cartilage and columella. The nasal septal swell body is a widened region of the anterior nasal septum located anterior to the middle turbinate at the internal nasal valve. Histological analysis of this tissue demonstrates an increased amount of venous sinusoids and fewer glandular elements compared to adjacent septal mucosa. The high proportion of venous sinusoids suggests the capacity to alter nasal airflow in a similar manner to the inferior turbinates.

Blood supply of the nasal septum [2] : Both the external and internal carotid arteries contribute to the vascular supply of the nasal septum . The external carotid artery branches supplying the septum include the sphenopalatine and greater palatine arteries (branches of the internal maxillary artery). The sphenopalatine artery supplies the posteroinferior septum by a branch called the posterior septal artery. The posterior septal artery is the basis of the nasoseptal mucosal flap which is the workhorse for endoscopic skull base reconstruction. The greater palatine artery enters the nasal cavity through the incisive canal to supply the anteroinferior portion of the septum. The septal branch of the superior labial artery (branch of the facial artery) contributes to the vascular supply of the caudal septum and columella. The internal carotid artery branches supplying the septum include the anterior and posterior ethmoid arteries (branches of the ophthalmic artery). The anterosuperior and posterosuperior portions of the nasal septum receive vascular supply from the anterior and posterior ethmoid arteries respectively. The anterior ethmoid artery, posterior septal artery and septal branch of superior labial artery contribute to Kisselbach's plexus which is located along the anterior nasal septum at Little's area . This region is formed by the anastomosis of these arteries which terminate as a rich vascular bed of long capillary loops. Kisselbach's plexus is the most common location of epistaxis due to its rich vascular supply and susceptibility to injury from such factors as turbulent airflow and digital trauma. The venous system drains via the sphenopalatine vessels into the pterygoid plexus posteriorly and into the facial. Veins anteriorly. Superiorly, the ethmoidal veins communicate with the superior ophthalmic system and there may be direct intracranial connections through the foramen caecum into the superior sagittal sinus.

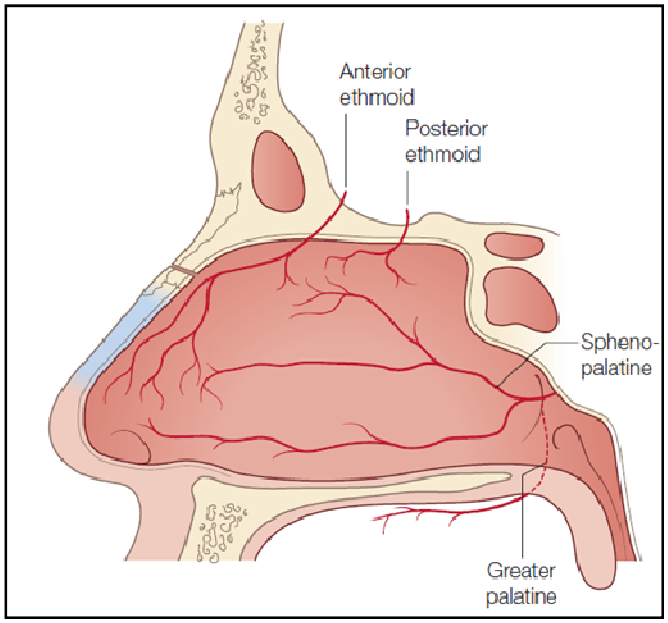


[2]) Dustin M. Dalgorf and Richard J. Harvey . Anatomy of Nose and Paranasal Sinuses, in: John C Watkinson and Raymond W Clarke , *Scott-Brawn's Otorhinolaryngology, Head and Neck Surgery* , 8th , Taylor & Francis Group, LLC. 2018 ; vol 2, P. 967.

Lateral nasal wall and turbinates[3] : The inferior, middle and superior turbinates are internal structures found along the lateral nasal wall. The middle and superior turbinates arise from extensions of the ethmoid bones whereas the inferior turbinate is an embryologically independent osseus structure. The space between the lateral nasal wall and inferior, middle and superior turbinates is called the inferior, middle and superior meatus respectively. Each meatus is associated with the connection between a specific anatomical structure and the nasal cavity along a series of well-defined drainage pathways. The lacrimal duct drains into the inferior meatus approximately 1 cm posterior to the head of the inferior turbinate. Although not considered a true valve, the opening of the nasolacrimal duct is called Hasner's valve which is formed by small folds of mucosa. The middle meatus forms the common drainage pathway of the maxillary, anterior ethmoid and frontal sinus into the nasal cavity. The superior meatus forms the common drainage pathway of the posterior ethmoid air cells. Turbinates are structures filled with vascular channels and venous sinusoids which serve to warm and humidify air and modify nasal airflow resistance. The turbinates continuously dilate and constrict under sympathetic control in response to environmental conditions. A process occurs every 0.5–3 hours in a normal physiological phenomenon known as the 'nasal cycle' resulting in alternating congestion and decongestion of the nasal cavities. Turbinate hypertrophy is a common cause of nasal obstruction in which the turbinates are either chronically congested or hypertrophied due to allergic or non-allergic triggers as part of an inflammatory rhinitis conditions.

Blood supply of the lateral nasal wall: Both the internal and external carotid arteries supply the lateral nasal wall. The sphenopalatine artery contributes the majority of the arterial supply to the turbinates and lateral nasal wall . It enters through the sphenopalatine foramen which lies just inferior to the horizontal attachment of the middle turbinate. The sphenopalatine foramen is formed by the sphenopalatine notch of the palatine bone in articulation with the sphenoid bone. The crista ethmoidalis is a small crest of the perpendicular plate of the ted anterior to sphenopalatine foramen and serves as a consistent and reliable landmark to identify this vessel during endoscopic dissection. The sphenopalatine artery commonly branches lateral to the crista ethmoidalis with many variations in the branching pattern. In one cadaver study, 97% of specimens had two or more branches of the sphenopalatine artery medial to the crista ethmoidalis. It is critical that the surgeon is aware of these variations and controls all branches to ensure successful endoscopic ligation of the sphenopalatine artery for epistaxis. If more proximal vascular control is required, the internal maxillary artery can be ligated in the pterygopalatine or infratemporal fossa by removal of the posterior wall of the maxillary sinus. A small area along the anterior aspect of the lateral nasal wall is supplied by a branch of the facial artery. The inferior part of the lateral nasal wall adjacent to the palate is supplied by the greater palatine artery. The internal carotid artery contribution is via the anterior and posterior ethmoid arteries (branches of the ophthalmic artery) which supply the superior lateral wall. The anterior ethmoid artery traverses three compartments of the head during its course from the orbit to the olfactory fossa and into the nasal cavity. After branching from the ophthalmic artery in the orbit, the anterior ethmoid artery passes between the superior oblique and medial rectus muscles through the anterior ethmoid foramen. This portion is easily identified on pre-operative coronal CT imaging. The anterior ethmoid artery travels through the ethmoid cavity obliquely in a posterior to anterior direction either within the bone of the skull base or a mucosal mesentery. The artery traverses intra-cranially into the olfactory fossa through the lateral lamella of the lamina cribrosa. After entering the intra-cranial cavity, it gives off anterior meningeal branches before re-entering the nasal cavity through the cribroethmoidal foramen. Within the nasal cavity, it divides into the anterior and posterior nasal arteries. The anterior and posterior nasal arteries each give rise to lateral and medial branches that supply the lateral nasal wall and nasal septum respectively. The anterior ethmoid artery is more difficult to access surgically, with only 20% of arteries found within a mesentery that can be successful clipped via a transnasal approach. Endoscopic removal of the lamina papyracea allows identification of the anterior and posterior ethmoid arteries between the periobita and skull base. Alternatively, an external approach via a modified Lynch incision can be used. There is considerable overlap between the internal and external carotid arterial systems on each side and between sides of the nasal cavity which can complicate attempts at arterial ligation in the management of epistaxis.

Vascular supply of lateral nasal wall [3]



Primary Paranasal Sinus Surgery[4] : The undertaking of primary endoscopic sinus surgery (ESS) requires a detailed familiarity with the relevant anatomy, a fundamental appreciation for the normal sinonasal physiology, a comprehensive understanding of the surgical indications and a respect for the potential complications that may arise. Indications for primary ESS can be divided into relative and absolute indications. The relative indications for ESS are what drive the vast majority of surgical procedures world-wide, and these include symptomatic chronic rhinosinusitis (CRS) with or without polyps that fails aggressive medical management, recurrent acute bacterial rhinosinusitis, and exacerbation of

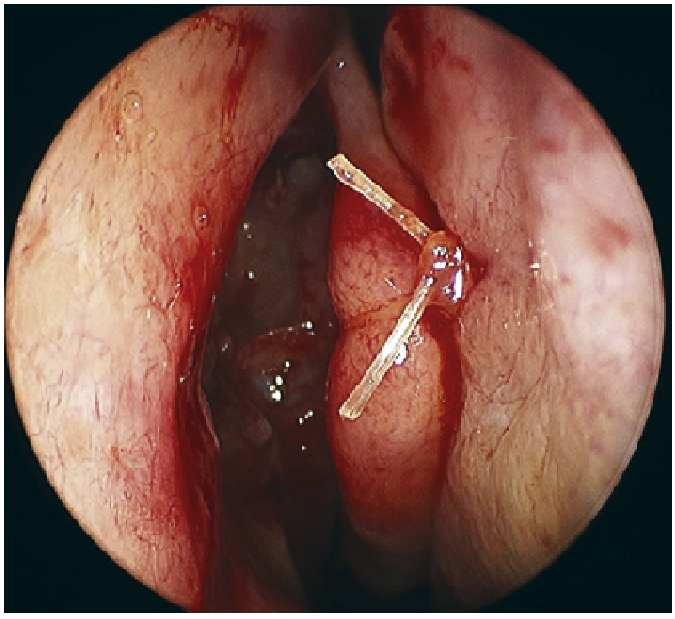
[3]) Dustin M. Dalgorf and Richard J. Harvey . Anatomy of Nose and Paranasal Sinuses, in: John C Watkinson and Raymond W Clarke, *Scott-Brawn's Otorhinolaryngology, Head and Neck Surgery*, 8th , Taylor & Francis Group, LLC. 2018; vol 2, P. 969.679

[4]) Kevin C. Welch, MD . James A. Stankiewicz, MD ,Primary Paranasal Sinus Surgery , in : P. ASHLEY WACKYM, JAMES B. SNOW JR., ***Ballenger's OTORHINOLARYNGOLOGY 18 HEAD AND NECK SURGERY***, P. Ashley Wackym, James B. Snow, Jr.2016 ; P 2220

related upper and lower airway disease in patients with asthma, aspirin intolerance, cystic fibros is and autoimmune disease. This list is not exhaustive. The absolute indications are important to understand and recognize due to the fact that prompt and thorough ESS can result in organ-sparing and/or life-sparing intervention.

These absolute indications include managing the complications that stem from an untreated or inadequately treated episode of acute bacterial rhinosinusitis. Such examples of this include symptomatic (eg, loss of visual acuity, etc) orbital cellulitis or abscess which fail to improve despite appropriate systemic antibiotic therapy, central nervous system infectious complications such as meningitis, subdural empyema or parenchymal abscess or acute invasive fungal sinusitis.

Medialization Procedures to Middle Turbinate[5)]**:** Medialization can also be achieved by creating a small scar band between the middle turbinate and the nasal septum. Packing in the middle meatus is necessary to keep the surfaces in contact long enough to heal together and create an adhesion (usually 5 to 7 days). The middle turbinate can also be suture fixated to the nasal septum using a dissolving suture. This technique can successfully secure a destabilized middle turbinate in most cases.



Endoscopic image illustrating how suture medialization can be combined with controlled scar creation between the middle turbinate head and septum "Bolgerization." (6)

PATIENTS AND METHODS

Comparative cross sectional study focus on middle turbinate medicalization in patients underwent fess operation in Al-Yarmook teaching hospital in a period between March 2017 to June 2018 in determined days in a week Thirty six patients included in our study. After taking history and routine otolaryngological examinations were done and sent for imaging if needed. and when fess operation needed the patient included in the study. We collect the data in three categories, patients without middle turbinate medicalization, and patient with cocopexy i.e suturing of middle turbinate to septum ,and patient with bolgeraization which mean cross hatch of bothe septum and middle turbinate, and made the categories as time of operation , patient nasal patency , infection , adhesion in day one and after 1week and after 2weeks and after 1month and 3months and 6months.

Inclusion criteria

- patients undergo fess.
- both sex.
- patients above age 16.

Exclusion criteria

- Uncooperative patients.
- Patient with suspension of malignancy.
- Diabetic patients.
- Patient with previous history of nasal surgery.

Questionnaire

1- history

Name:-
Age :-
Sex:-
Address :-
Occupation :-
Phone:-

Chief complain:

Duration:-
Diabetic :-
Smoker:-
Any nasal surgery

2- examinations

Findings

Follow up in (day 0 /1wk/2wk/1mo./3mo./6mo.)

Category /medicalization type	Time of operation	Nasal discharge	Nasal patency	Adhesion
Medialization by freer				
Medialization by conchopexy				
Medialization by bolgerization				

RESULTS

Gender distribution

Category /medicalization type	Male	percent age	Female	percentage	total
Medialization by freer	7	58.33%	5	41.66%	12
Medialization by conchopexy	3	25%	9	75%	12
Medialization by bolgerization	8	66.66%	4	33.33%	12
total	18	50%	18	50%	36

[5)] Richard R. Orlandi, Justin H. Turner, and Peter H. Hwang, Middle and Inferior Turbinates, in :James N. Palmer, Alexander G. Chiu, *Atlas of Endoscopic Sinus and Skull Base Surgery* , Elsevier Inc. , 2013 ; P 23.

Recurrence

Category/medicalization type	Nasal discharge	Nasal obstruction	Adhesion	Total Of recurrence	percent
Medialization by freer elevator	9	6	6	6	50%
Medialization by conchopexy	4	5	2	2	16.6%
Medialization by bolgerization	3	2	1	1	8.3%
total					

Time of operation

Category /medicalization type	Time of operation
Medialization by freer	-(*)
Medialization by bolgerization	+4 min
Medialization by conchopexy	+13 min .

(*) (-)this mean that no extra time to original operation

DISCUSSION

Gender distribution: In medialization by freer elevator i.e medialization without any fixation male percentage is 58.33% to female 41.66% ,, this may explained by patient preference and females want a little intervention approach. In medialization by conchopexy 25% are males and 75% females. In medialization by bolgraization 66.66% were males and 33.33% females … the cause clarified above.

Recurrence

Concerning type of medialization, 50% (6 of 12 case)recurrence of sinusitis with medialization by just freer elevator without fixation to middle septum, this may caused by reobstruction of maxillary ostium, and this agree with Khaled Mohamed (2015) [6] study which reveal that recurrence occur in 49% of the patients who underwent just medialization of middle turbinate. In medialization by cochopexy 16.6% (2 out of 12 case) sinusitis recurrence. In medialization by bolegraization the sinusitis recurrence is 8.3% i.e 1 out of 12 cases

Time of operation

- In medicalization by freer elevator no extra time to original operation.
- In bolgerization the additional time is about 4 min.
- In medicalization by conchopexy the extra time to operation is about 13 min.

All this above can be explained by the technique time.

Conclusion

- Females prefer less intervention technique in medicalization of middle turbinate
- Boligraztion is the best result of medialzation type of middle turbinate. by less time consuming in comparison with cochopexy, and less recurrence

Recommendations

- Its better to do medicalization of middle turbinate in FESS surgery.
- Bolgiraization is the best type of middle turbinate medialization.
- The subject need further researches and studies about another types of medialization like by laser and harmonic and bipolar and others.

[6]) Khaled Mohamed Bofares. *Effect of Middle Turbinate Intervention on Outcomes of Middle Meatal Endoscopic Surgery*, International Journal of Otorhinolaryngology 2015; 1(2): 13-19 Published online September 23, 2015