# SURGICAL OUTCOMES FOR RHINOGENIC CONTACT POINT HEADACHE

*Thesis*

Submitted for Fulfillment of Master Degree in Otorhinolaryngology

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**سُبْحَانَكَ لاَ عِلْمَ لَنَا إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ**

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**Mohamed Hasan Mohamed Nasr**

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# ABSTRACT

**Objectives** investigate the role of some anatomical variations of the nose in rhinogenic contact point headache and to evaluate the role of surgery in management of such headache.

**Patients and methods** study included twenty patients from July 2013 till October 2013 with rhinogenic contact headache of more than one year duration. Evaluation of surgical management for these cases was done as regards improvement of headache duration, intensity and frequency over a follow up period of three months at least after the operation.

**Results** twenty patients were included with ages ranging from 19 to 45 years, eleven of them were males and nine were females. Sixteen cases showed complete cure, 2 showed improvement and 2 showed unsatisfied results. Deviated septum was found in 16 cases (80%), hypertrophied middle turbinate in 9 patients (45%), concha bullosa in 6 patients (30%) and hypertrophied inferior turbinate in 5 patients (25%). More than one anatomical variation was encountered in most of the cases. The two failed cases showed pre operative long duration since they started to complain from headache and longer duration of each headache attack, one of them was post menopausal and the other was on psychiatric medications started after the operation.

**Conclusion** intra nasal anatomical variations play a role in pathogenesis of contact rhinogenic headache and the surgical treatment of these anatomical variations succeeded in eliminating or significantly reducing the contact headache.

**Key words** anatomical variations, contact headache, rhinogenic.

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# INTRODUCTION

Patients with facial pain present a diagnostic challenge. Difficulties in management arise because of the frequency of referred pain and the overlap in symptoms between different conditions. Painful stimuli affecting facial structures are mostly transmitted via afferents in the trigeminal nerve to the spinal tract in the brain stem ***(Blau, 1982)***.

The most sensitive area of the nose is the lateral wall which when stimulated by impacted nasal septum can cause referred trigeminal pain and chronic headache ***(Iow and Willatt, 1995)***.

The essence of the problem is how to diagnose the cause relatively quickly, effectively and methodologically. A careful history is central in establishing a correct diagnosis. It is possible that the pressure exerted by septal deviations on adjacent sensory nerves can produce pain, which has been called "the anterior ethmoidal nerve syndrome" ***(Stammberger, 1991)***.

In addition to their direct neurological effects, reflex changes may result from septal deformities which affect the nasopulmonary and nasal reflexes leading to autonomic vascular disturbance resulting in nasal congestion and consequently headache ***(Stammberger, 1991)***.

Stimulation of the lateral wall of the nose through contact between middle turbinate and nasal septum in cases of severely deviated nasal septum, enlarged pneumatized middle turbinate (concha bullosa), or medially displaced middle turbinate by enlarged ethmoidal bulla produces contact oedema between mucosal surfaces and release of pain mediators resulting in pain radiating along nerve fibers ***(Stammberger, 1991)***.

The commonest surgical modality used for management of headache is submucous resection of nasal septum and partial middle turbinectomy. Patients are relieved of their headaches if the headaches are most intense over the frontal region, pressure like in nature. It is possible that headaches recur in the long term, and it is postulated that central mechanisms may play a role ***(Iow and Willatt, 1995)***.

Many people with facial pain suggestive of sinus disease are ultimately proved through extensive investigations to have intranasal pathology without sinusitis. The middle turbinate in close proximity to other mucosal surfaces has been implicated as a possible cause of the contact point rhinogenic pain. Surgical removal appears to provide relief in appropriately selected patient population ***(Landrigan and Kirkpatrick 1992).***

# AIM OF THE WORK

The aim of the work is to assess the role of the various anatomical variations of the nose in the pathogenesis of contact point rhinogenic headache of non- infective or non-sinus headache causes. Also to put the criteria of diagnosing of such contact point rhinogenic headache, to search for its clinical presentation, Computed tomography and the best methods of managing this headache.

# SINONASAL ANATOMICAL VARIANTS PREDISPOSING TO RHINOGENIC HEADACHE

## 1) The lateral wall of the nose:

It is formed by medial wall of maxilla, ethmoidal labyrinth and perpendicular plate of the palatine bone. On the lateral wall of the nose there are the superior, middle and inferior turbinates and just below and lateral to each is the corresponding meatus. The middle meatus is the key area since the frontal sinus, anterior and middle ethmoid cells, and maxillary sinus all drain into this area. Underneath the middle turbinate the most prominent structures from anterior to posterior are the uncinate process, the hiatus semilunaris, and the bulla ethmoidalis ***(Stammberger, 1991)*** (Fig. 1, 2).

The lateral wall bounds most of the paranasal sinuses and receives their openings. It shows the following features:

## A): The Superior Turbinate and its relations:

It is a small projection of the ethmoid bone, approximately 1.5 cm in length. It is more posterior and superior to the middle turbinate. Forward, the upper part of the superior turbinate meets the upper end of the lamina recurvata of the middle turbinate (Ethmoturbinal is divided into lamina basilaris and lamina recurvata. The lamina basilaris forms part of the lateral wall attachment. The lamina recurvata is more medial with a curled configuration). and/or the superior turbinate (if present) forming "turbinate lamina" ***(Friedman & Katsantotonis, 1989).*** The superior turbinate forms the inner wall of the posterior ethmoidal cells ***(Rice, 1990).***

**The Superior Meatus:**

It is the shortest and the smallest one and containing ostia of posterior ethmoidal cells ***(Rice, 1989).***

**The Supreme Turbinate:**

The ethmoidal turbinates are classically two: the middle and the superior turbinates. A third ethmoidal turbinate may be present in 70 to 85% of individuals according to some studies. It is called the "supreme turbinate".

**Postreme Cells:**

The air cells lying between the basal lamella of the supreme turbinate and the basal lamella of the superior turbinate are called the "Postreme cells" ***(Ritter, 1978)***.

**The Spheno ethmoidal Recess:**

It is a small depression above and behind the superior turbinate, it receives the sphenoid sinus opening ***(Mafee, 1991).***

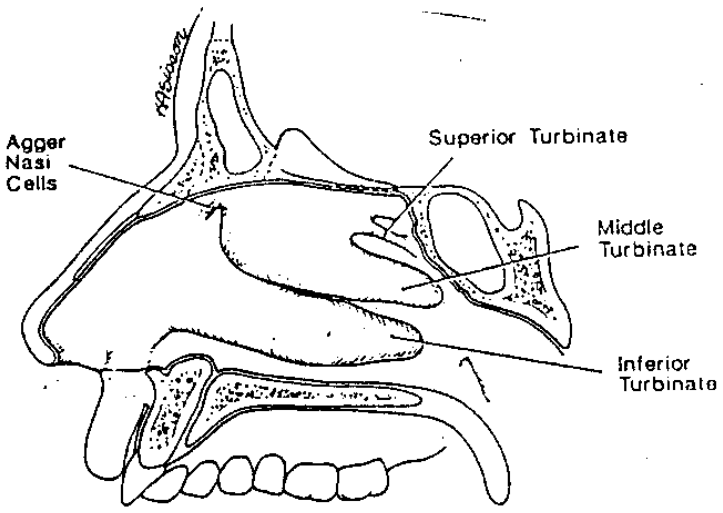


**Fig. (1): Sagittal view of the lateral nasal wall *(Becker, 1989)***

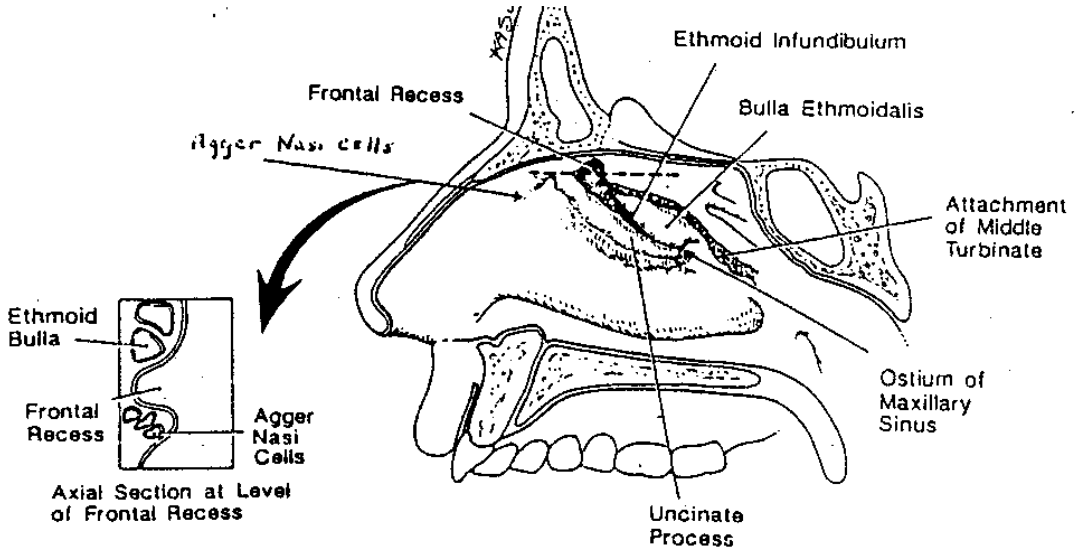


**Fig. (2): Sagittal view of the lateral nasal wall with the middle turbinate removed, showing the structures bellow the middle turbinate and Agger Nasi cells. (Becker, 1989)**

## B) The middle turbinate (M.T.) and its relations:

The middle turbinate is an osseous shelf of bone that originates from ethmoid bone. It measures approximately 3.5 to 4 cm in length. Its anterior attachment is rooted to the cribrifrom plate. However, the marginal attachment of middle turbinate is variable, sometimes it is very low on the lateral nasal wall, in others it is wide and can go further ventrosuperiorly ***(Ritter, 1982)***.

The middle turbinate slants by its free edge posteroinferiorly 15 degrees so that its posterior tip lies at or immediately inferior to the sphenopalatine foramen ***(Ritter, 1982).***

The upper border of middle turbinate has two important upper attachments from the surgical point of view:

1. The anterior half is attached to the cribriform plate and the skull base. This forms the upper medial limit of dissection in functional endoscopic sinus surgery (FESS).
2. The posterior half is attached to the lamina papyracea (medial wall of the orbit) and is called the ground lamella. It runs first obliquely downwards, then horizontally backwards. This part separates the anterior and middle ethmoid cells from the large posterior cells ***(Rice and Schaefer, 1988)***.

Just in front of anterior tip of the middle turbinate lie the agger nasi cells, and superior to these are the cells of the frontal recess. Under the turbinate lie the cells of the bulla ethmoidalis and the ethmoid infundibulum. Posterior and superior to its body lie the posterior ethmoidal cells ***(Rice and Schaefer, 1988)***.

The middle turbinate like other turbinates plays an important role in regulating the humidity and temperature of inspired air.

The sympathetic and parasympathetic nervous system are responsible for change in the turbinate size according to physiologic requirements by increasing or decreasing the volume of blood contained in their erectile tissue ***(Stammberger, 1991)***. It also plays an important role in olfaction by the olfactory nerve endings, which are present in the olfactory cleft.

## a) Variations of the middle turbinate:

The middle turbinate can show many anatomic variations that can narrow the middle meatus and lead to mucosal contact sites:

## 1. Variations of the shape:

a) In so-called "paradoxically bent middle turbinates" the concavity of the turbinate points towards the septum and its convexity towards the lateral wall (Fig. 3).

This anatomic variation usually occurs bilaterally. A paradoxically bent M.T is also not a pathologic finding, although the paradoxical curvature can become quite pronounced and thereby cause significant narrowing of the entrance to the middle meatus. In this instance the paradoxically bent turbinate is usually combined with other anatomic abnormalities that together produce a significant narrowing, of the entrance to the middle meatus and extensive mucosal contact areas ***(Stammberger, 1991)***. Marked paradoxically curved middle turbinates can occasionally make endoscopic surgical manipulation in the ethmoid sinus extremely difficult.