



## Is septoplasty effective rhinogenic headache in patients with isolated contact point between inferior turbinate and septal spur?

Fazilet Altin<sup>a</sup>, Cemal Haci<sup>b,\*</sup>, Yalcin Alimoglu<sup>a</sup>, Suleyman Yilmaz<sup>a</sup>

<sup>a</sup> Department of Otorhinolaryngology, Haseki Training and Research Hospital, Health Sciences University, Istanbul, Turkey

<sup>b</sup> Department of Otorhinolaryngology, Acibadem Healthcare Group Taksim Hospital, Istanbul, Turkey

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### ABSTRACT

**Background:** Rhinogenic headache is a painful sensation in the head and face due to intranasal contact point without any mass or inflammatory findings. Surgery is recommended in patients with nasal obstruction; however the approach in case of isolated mucosal contact point that does not cause obstruction is controversial. Our aim is to observe changes in the severity of headache in patients with isolated mucosal contact point and headache who do not complain of nasal obstruction.

**Methods:** Our study included patients with unilateral headache without any nasal and/or paranasal sinus pathology. We confirmed the presence of mucosal contact by nasal endoscopy and by computed tomography (CT). One hundred patients with isolated mucosal contact point without any problem in breathing were included in this study. All participants were treated by topical nasal corticosteroid for a month. Surgery was recommended to the patients with no satisfactory relieve of headache. Visual Analog Scales (VAS) were used to evaluate the severity of headache in patients at time of diagnosis (0 month), after a medical treatment (1st month) and after a surgical or medical treatment (6th month). The results were compared with each other statistically.

**Results:** There was a decrease in VAS values after a month of medical treatment in all patients with isolated contact point ( $Z = -8.352$ ;  $p = 0.0$ ). VAS values significantly improved after surgical treatment group ( $Z = -4.97$ ;  $p = 0.0$ ). However, VAS values of patients increased at 6th month in medical treatment group ( $Z = -5.341$ ;  $p = 0.0$ ). After a successful surgical removal of mucosal contacts, the decrease of headache severity was more intense in patients with surgical treatment group than in the patients with medical treatment group ( $Z = -8.441$ ;  $p = 0.0$ ).

**Conclusion:** Surgical correction provides a more effective outcome in patients with rhinogenic headache. However, it is difficult to convince that headache may improve with surgery in these patients especially with isolated mucosal contact point and without nasal obstruction. In order to prove the benefit of surgery, we believe that medical treatment can be used as a guide.

### 1. Introduction

Chronic recurrent headache is a serious problem affecting the quality of life. Many local or systemic etiological factors have been accused for chronic recurrent headache. Most of these patients are examined by different specialists such as neurologist, ophthalmologist, dentists, psychiatrist etc. without a satisfactory cure. But, among the different etiology, clinicians should keep in mind the possible rhinogenic pain in the absence of the nasal inflammatory process [1]. Rhinogenic headache may be due to sinonasal disorders such as nasal septal deviations or spurs, medialized or hypertrophied middle turbinate, giant ethmoid bulla, bullous uncinated process and paradoxically middle turbinate [2]. In these patients, surgical correction is

recommended to recover from their headache.

Mucosal contact points between septum and lateral nasal wall can be detected in patients with headache. The relationship between headache and nasal structures named as rhinogenic headache was first described by Wolff in 1948 [3,4]. Rhinogenic headache has recently begun to be of interest and contact points are accepted as a cause of headache by International Headache Society classification [5]. Mechanism of rhinogenic headache was described as release of substance P and stimulation of unmyelinated C fibers in many studies [6,7]. However, many authors rejected this mechanism [8]. Therefore the mechanism of the rhinogenic headache is still unclear.

Surgical correction provides a more effective outcome in patients with rhinogenic headache. If patient has nasal obstruction, it is easy to

\* Corresponding author.

E-mail address: [tzemalchatzi@hotmail.com](mailto:tzemalchatzi@hotmail.com) (C. Haci).

offer septoplasty. However, it is difficult to convince that headache may improve after surgery in patients especially with isolated mucosal contact point between inferior turbinate and septum and without nasal obstruction. In order to prove the benefit of surgery, we believe that medical treatment can be used as a guide. Authors aimed to investigate the effect of surgical and medical treatment on pain relief in patients with isolated mucosal contact point between inferior turbinate and septum.

**2. Material and methods**

Patients who presented with chronic headache or facial pain without symptoms and signs of acute and chronic sinonasal inflammation, and who present with intranasal mucosal contact point between inferior turbinate and nasal septum between 2016 and 2018 were included in the study. The patients with abnormal neurologic, ophthalmologic, dental, and internal findings were excluded. Also the patients with allergic rhinitis, with previous nasal surgery history, with more than one mucosal contact (for example, because of septal deviation and concha bullosa at the same time) and with anatomical nasal variations were excluded.

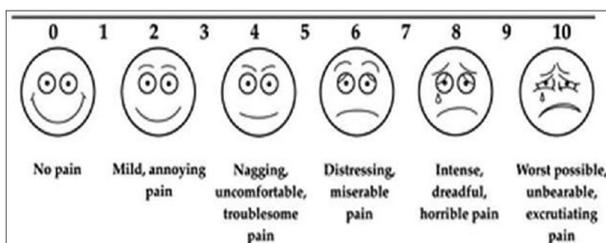
The presence of mucosal contact point was verified using the findings of computed tomography (CT) without contrast in the coronal and axial sections (Picture 1) and rigid nasal endoscopy of the nasal cavity. The lidocaine test was used to confirm the diagnosis. The test was done with a pledget of cotton soaked with a 10% solution of lidocaine placed on the point of contact. If patients reported pain relief > 50% within 10 to 15 min, the test was considered to be positive [2].

Visual Analog Scale (VAS) was used to assess headache pain levels. VAS is psychometric response scale used for measurement subjective severity of headache (Picture II). Headaches severity was graded on a scale of 0 to 10 points, where 0 degrees denoted not troublesome while 10 degrees was worst thinkable troublesome.

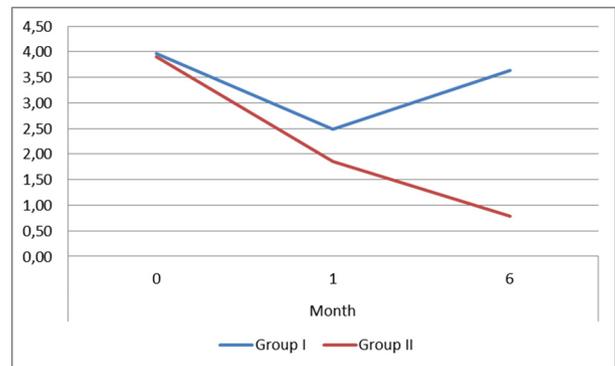
All participants were initially given VAS and results were recorded. Topical nasal steroid treatment was applied for a month (what is the rationale of giving topical corticosteroid treatment?). At the end of 1st month, patients were given VAS scale to evaluate severity of headache. Endoscopic septoplasty for removal of septal spur was offered considering that medical treatment could provide temporary relief and surgical correction provide more long lasting relief. At this point subjects were divided into two groups: Group I and Group II. Subjects in group I underwent surgical removal of the septal spur through endoscopic septoplasty performed by the same surgeon. Subjects who refused surgery continued medical treatment for another month constituted group II. VAS was given to both s at the 6th month and all VAS results were compared with each other.

We evaluated the intensity of pain using VAS before medical treatment, at 1st month of therapy and at 6th months after therapy and surgery. VAS scores of patients were compared with the “paired sample t-test”, and a P value < 0.05 was considered significant. All findings were analyzed with SPSS (V.20).

The prospective study was conducted after fulfilling and getting the approval of ethics committee of Haseki Training and Research Hospital



**Picture I.** Paranasal CT of isolated contact point between inferior turbinate and septal spur.



**Picture II.** Visual Analog Scale (VAS).

Clinical Research Ethics Committee (03.02.2016/308). Our study was carried out in concordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki). Informed consent was obtained from all patients participating the study.

**3. Results**

In this conducted study between 2016 and 2018, ninety-nine patients who were presenting with chronic headache or facial pain with intranasal mucosal contact point between inferior turbinate and nasal septum were included in the study. Mean age of patients is 32, 68 ± 7 (17–54) and 58 (58, 6%) of patients were female, 41 (41, 4%) of patients were male. 51(51, 5%) of patients accepted surgery while 48 (48, 5%) of patients did not accept. Both group of patients with or without surgery, VAS values of before medical treatment, at 1st month of therapy and at 6th months after therapy by medications, as well as after surgical treatment were shown on Table 1.

When the headaches of our patients were evaluated, it was stated that about all of the patients had headache decreased and increased in the day according to the nasal cycle. The features of the headaches of our patients are given in Table 2.

In group I, at 1st month VAS scores was significantly decreased when compared with initial values (Z = -5.833; p = 0, 0). After surgical remove of septal spur, VAS values at 6th month show significant improvement when compared to the values at the time of diagnosis (Z = -6.075; p = 0.0) and also to the values of 1st month of therapy (Z = -4.97; p = 0.0).

In group II, at 1st month VAS scores was significantly lower when compared with initial values (Z = -6.05; p = 0.0). However, VAS scores at 6th month increased when compared with VAS scores of 1st month (Z = -5341; p = 0.0). Although the values of VAS were still lower than before treatment (Z = -3.771; p = 0.0), there was an increase after released medical treatment.

Finally, we compared VAS values of two groups with each other. Despite, there is a decrease in severity of headache in both groups, headache intensity reduction was more pronounced in the patients after the surgical removal of mucosal contacts (Z = -8.441; p = 0.0) (Fig. 1).

**Table 1**

VAS values of before medical treatment, at 1st month of therapy and at 6th months after surgical treatment (group I), as well as after medical treatment (group II).

	0 month VAS Mean ± SD	1st month VAS Mean ± SD	6th month VAS Mean ± SD
Group I (n = 51)	3,91 ± 0,14	1,85 ± 0,12	0,79 ± 0,14
Group II (n = 48)	3,96 ± 0,13	2,49 ± 0,12	3,64 ± 0,13

Group I: Patients accepted septoplasty, Group II: Patients refused septoplasty, VAS: Visual Analog Scale, SD: Standard Deviation.

**Table 2**  
Features of rhinogenic headache.

	Length of headache Mean $\pm$ SD	Duration of headache Mean $\pm$ SD	Constant	Episodic
Group I (n = 58)	23,78 $\pm$ 16,86	95,88 $\pm$ 52,39	15	43
Group II (n = 41)	22,92 $\pm$ 16,42	97,71 $\pm$ 53,13	13	30

Group I: Male, Group II: Female, SD: Standard Deviation.



**Fig. 1.** VAS values of Group I and Group II.

Footnote: Group I: Patients accepted septoplasty, Group II: Patients refused septoplasty, this figure showing the severity of the headache after the operation of the patients.

#### 4. Discussions

Headache is a condition that most people feel commonly with various severities. There are many causes of headache such as neuralgias, migraine, cervical and vascular disorders, temporomandibular joint disorders, dental abscess, head and neck tumors, intracranial and ophthalmologic pathologies [9]. And also sinonasal pathologies such as nasal polyps, concha bullosa, sinusitis etc. could cause headache [7].

Any contact point between lateral nasal wall and nasal septum can cause headache called as “rhinogenic headache” [10]. Pathophysiology is still unclear but some authors claimed substance P (SP) and stimulation of unmyelinated C fibers plays an important role [11]. When there is a contact between lateral nasal wall and septum, this cause pressure and SP releasing resulting in local reflexes such as vasodilatation, plasma extravasation, and hypersecretion and perivascular inflammation [6,11]. All these can cause headache similar to migraine with aura. This is why many patients were treated in neurology and could not be cured [2]. In some studies, it was shown that SP level is higher in patients with both mucosal contact point and nasal polyp or hyperplastic mucosa [12]. In allergic situations, patients were experiencing more severe headaches [13]. That may be due to the increased mucosal contact area as a result of turbinate hypertrophy which may lead to a greater secretion of SP causing increase in headache severity. More detailed work should be done to prove this mechanism.

Evaluation of rhinogenic headache needs multidisciplinary approach. Also detailed rhinoscopic and endoscopic examination is needed for diagnosis, Paranasal Computerized Tomography (CT) should be done to rule out sinusitis, nasal polyposis, concha bullosa and other pathologies and also to exclude other reasons. CT is helpful to recognize some pathologies that cannot be detected by physical examination and is helpful to decide the location and the necessity of the surgery [14].

In rhinogenic headache, many tests are recommended for surgical selection in patients. Tosun et al. [15] suggested that cocaine test to predict success of surgery in patients with mucosal contact. However, they did not found correlation between positive test results and surgical

intervention. That may be due to placebo effect of cocaine. For nasal shrinkage test, applying nasal decongestant and topical anesthetics such as lidocaine [1] can be also used to contact area, however some investigators believe that this is an unreliable test [16,17]. Topical nasal steroid can be also used for treatment of rhinogenic headache [18]. In our study we use nasal steroid for a month to relieve headache by reducing inferior turbinate volume, in this way we supported the diagnosis of rhinogenic headache. If patient have a decrease in headache after treatment, we thought that these patients would benefit from septoplasty to reduce contact since we believed that surgical treatment is the choice for rhinogenic headache.

Pain can be felt in different regions by stimulating different areas of the nasal mucosa. Stamberger and Wolf [11] applied pressure on mucosa of superior septum resulting pain around eyes; on mucosa of superior turbinate resulting pain around nasal root, eye, zygoma and ear; on mucosa of ethmoid resulting in pain around eye and lateral cantus as well as lacrimation and photophobia as if migraine. Lin and Ho [19] found that headache in the frontal region is the most common. Similarly, headache of our patients had also located at frontal region and was a pressure like in nature.

Bilal et al. [1] showed that intranasal contact points were more frequent between the nasal septum and inferior turbinate. Similarly we found most common contact point between nasal septum and inferior turbinate and only patients with these contacts point were included in study. Hammad and Gomma [20] reported septal deviation causing nasal obstruction could be also cause rhinogenic headache. They found that when nasal obstruction resolved by surgery headache improvement can be seen. Tosun et al. [15] reported that septal spur can cause rhinogenic headache without inflammation. In our study, we used CT to rule out nasal obstruction, by this way we selected patients with only contact point between inferior turbinate and nasal septal spur. And also we used paranasal CT to rule out any inflammation of paranasal sinus.

In many studies, it has been reported that the treatment of rhinogenic headache is surgery. Huang et al. [21] investigated 66 patients with rhinogenic headache due to with deviation of the nasal septum, with concha bullosa, and with orbitoethmoidal (Haller's) cell. They found that a reduction of intensity and frequency of headache after the surgical treatment. Chow et al. [22] found 82%; Parsons and Batra [12] found 91% and Bilal at al [1] found 92% improvement in headache level after corrective surgery. In our study, we found 96% of these patients headache recover completely.

There is no consensus about how long the follow-up period should be. In many studies, follow-up period is usually 6 months [18]. But Harrison and Jones [9] claimed that trial with a follow up period of over 12 months is needed to assess the place of surgery in the removal of contact point for treatment of facial pain. The follow-up period was 6 month in our study, but we believe this is enough time, however studies with longer follow-up period could be done.

The treatment of rhinogenic headache may be medical or surgical. Rhinogenic headache may occur again after medical treatment. We found that topical nasal steroid could be used as medical treatment of rhinogenic headache. We believe that the reduction in headache will be more effective and lasting after surgical correction. To our knowledge this is the first study which has a high number of patients with rhinogenic headache due to isolated contact between inferior turbinate and septal spur. Our study can be criticized for 6 month follow-up period;

long-term follow-up period may yield different results.

## 5. Conclusion

Rhinogenic headache is a common condition that can be treated with medical or surgical treatment. Although topical nasal steroid also relieve rhinogenic headache, long-term improvement of VAS values suggests that septoplasty may be preferred as a treatment modality in patients with isolated non-obstructive turbinate contact points.

## Disclosure statement

The authors confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

## References

- [1] Bilal N, Selcuk A, Karakus MF, Ikinciogullari A, Ensari S, Dere H. Impact of corrective rhinologic surgery on rhinogenic headache. *J Craniofac Surg* 2013;5:1688–91. <https://doi.org/10.1097/SCS.0b013e31827c7d8f>.
- [2] Sadeghi M, Saedi B, Ghaderi Y. Endoscopic management of contact point headache in patients resistant to medical treatment. *Indian J Otolaryngol Head Neck Surg* 2013;65:415–20. <https://doi.org/10.1007/s12070-013-0629-7>.
- [3] Roozbahany NA, Nasri S. Nasal and paranasal sinus anatomical variations in patients with rhinogenic contact point headache. *Auris Nasus Larynx* 2013;40:177–83. <https://doi.org/10.1016/j.anl.2012.07.007>.
- [4] Behin F, Behin D, Behin S, Baredes. Surgical management of contact point headaches. *Headache* 2005;45:204–10. <https://doi.org/10.1111/j.1526-4610.2005.05045.x>.
- [5] Olesen J. Classification and diagnostic criteria for headache disorders, cranial neuralgias and facial pain, Headache Classification Committee of the International Headache Society. *International Classification of Headache Disorders. Cephalalgia* 2004;24:1–151.
- [6] Gerbe RW, Fry TL, Fischer ND. Headache of nasal spur origin: an easily diagnosed and surgically correctable cause of facial pain. *Headache* 1984;24:329–30. <https://doi.org/10.1111/j.1526-4610.1984.hed2406329>.
- [7] Herzallah IR, Hamed MA, Salem SM, Suurna MV. Mucosal contact points and paranasal sinus pneumatization: does radiology predict headache causality? *Laryngoscope* 2015;125:2021–6. <https://doi.org/10.1002/lary.25194>.
- [8] Abu-Bakra M, Jones NS. Does stimulation of the nasal mucosa cause referred pain to the face? *Clin Otolaryngol Allied Sci* 2001;26:403–32. <https://doi.org/10.1046/j.1365-2273.2001.00498.x>.
- [9] Harrison L, Jones NS. Intranasal contact points as a cause of facial pain or headache: a systematic review. *Clin Otolaryngol* 2013;38:8–22. <https://doi.org/10.1111/coa.12081>.
- [10] Patel ZM, Kennedy DW, Setzen M, Poetker DM, DelGaudio JM. “Sinus headache”: rhinogenic headache or migraine? An evidence-based guide to diagnosis and treatment. *Int Forum Allergy Rhinol* 2013;3:221–30. <https://doi.org/10.1002/alr.21095>.
- [11] Stammberger H, Wolf G. Headache and sinus disease: the endoscopic approach. *Ann Otol Rhinol Laryngol Suppl* 1988;13:3–23. <https://doi.org/10.1177/000348948809705501>.
- [12] Parsons DS, Batra PS. Functional endoscopic sinus surgical outcomes for contact point headaches. *Laryngoscope* 1998;108:696–702. <https://doi.org/10.1097/0005537-199805000-00013>.
- [13] Scarupa MD, Economides A, White MV, Kaliner MA. Rhinitis and rhinologic headaches. *Allergy Asthma Proc* 2004;25:101–5.
- [14] Karatas D, Yuksel F, Senturk M, Dogan M. The contribution of computed tomography to nasal septoplasty. *J Craniofac Surg* 2013;24:1549–51. <https://doi.org/10.1097/SCS.0b013e3182902729>.
- [15] Tosun F, Gerek M, Ozkaptan Y. Nasal surgery for contact point headaches. *Headache* 2000;40:237–40. <https://doi.org/10.1046/j.1526-4610.2000.00034.x>.
- [16] La Mantia I, Grillo C, Andaloro C. Rhinogenic contact point headache: surgical treatment versus medical treatment. *J Craniofac Surg* 2018;29:228–30. <https://doi.org/10.1097/SCS.00000000000004211>.
- [17] Clerico DM. Sinus headaches reconsidered: referred cephalgia of rhinologic origin masquerading as refractory primary headaches. *Headache* 1995;35:185–92. <https://doi.org/10.1111/j.1526-4610.1995.hed3504185.x>.
- [18] Peric A, Rasic D, Grgurevic U. Surgical treatment of rhinogenic contact point headache: an experience from a tertiary care hospital. *Int Arch Otorhinolaryngol* 2016;20:166–71. <https://doi.org/10.1055/s-0036-1578808>.
- [19] Lin SH, Ho CY. Paranasal sinus pathologies in patients presenting with headache as the primary symptom. *Cephalalgia* 2006;26:423–7. <https://doi.org/10.1111/j.1468-2982.2005.01058.x>.
- [20] Hammad MS, Gomaa MA. Role of some anatomical nasal abnormalities in rhinogenic headache. *EJENTAS* 2012;13:31–5. <https://doi.org/10.1016/j.ejenta.2012.01.006>.
- [21] Huang HH, Lee TJ, Huang CC, Chang PH, Huang SF. Non-sinusitis-related rhinogenic headache: a ten-year experience. *Am J Otolaryngol* 2008;29:326–32. <https://doi.org/10.1016/j.amjoto.2007.10.001>.
- [22] Chow JM. Rhinologic headaches. *Otolaryngol Head Neck Surg* 1994;111:211–8. <https://doi.org/10.1177/01945998941113P109>.