

# Endoscopic Management of Contact Point Headache in Patients Resistant to Medical Treatment

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**Abstract** The existence and the best treatment for contact point headache is a controversial issue. Therefore, this study tried to evaluate the response of the patients with a rhinogenic headache who were resistant to medical treatment to endoscopic sinus surgery. Thirty patients who suffered from a unilateral headache or facial ache for at least 1 year and resistant to medical treatment were evaluated in this research. The existence of the contact point was confirmed in CT scan and in nasal endoscopy. Moreover, a positive Lidocaine test was another important factor for selecting patients. Endoscopic surgery was the common method of surgery in patients. After 1 year, the headache and nasal obstruction were assessed according to Visual Analogue Scale (VAS) and compared to preoperative VAS. In 30 patients who entered this research, the average headache and nasal obstruction score according to VAS was  $7.4 \pm 1.4$  and  $7.9 \pm 2.5$ , respectively. These values consequently decreased to  $4.8 \pm 2.3$  and  $3.73 \pm 1.7$  1 year after surgery, respectively. The overall response rate was 93.3 % and no major complications were seen in this series. If there is strong clinical suspicion and meticulous selection criteria, provided that other causes of headache

have been ruled out, endoscopic management of the rhinogenic headache can be effective.

**Keywords** Sinus surgery · Rhinogenic headache · Headache · Facial pain · Endoscopic surgery · Medical treatment · Contact point headache · Nasal obstruction

## Introduction

Headache, as a common human problem [1–3], has been a real diagnostic dilemma. Most physicians confront many difficulties, especially in differentiating headache with a rhinogenic origin with other types [2–8]. Sinusitis, among the different causes of sinus headache, is a well established etiology, but a rhinogenic headache in absence of sinusitis is a debatable topic [2, 5, 7–15].

The exact mechanism of this type of headache is unclear. The prominent theory is the production of different neuropeptides in areas of contact mucosal points. The most famous neurotransmitter is the P substance and also the most common place of production is septum and middle concha [2, 7, 8, 16, 17].

However, there are several reports regarding the successful management of such patients [1, 2, 6, 8, 11, 13–15, 17–19]. Medical or surgical management are the two proposed treatment modalities [3, 6, 8, 14]. Independent of the type of therapy, most authors put emphasis on very precise selection of cases with a rhinogenic headache and also excluding probable neurologic or psychological causes of the headache [2, 4–9].

In view of the scarcity of confirming researches in this field, we conducted this study to evaluate the response of

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the rhinogenic headache patients resistant to medical treatment to endoscopic nasal surgery.

## Subjects and Methods

### Study Subjects

Thirty-one consequent patients who were visited at the ENT department of a tertiary referral center (Imam Khomeini Complex Hospital) were recruited to this study between May 2007 and January 2012. One patient did not participate in the follow-up sessions and was omitted from the study. Therefore, the remaining thirty cases were evaluated in this research.

### Inclusion Criteria

Patient who suffered from a unilateral headache in the head or the facial region for at least 1 year before entering the research which was susceptible to the cold weather were selected for the study. Moreover, the existence of the contact point was confirmed in CT scan and nasal endoscopy, between septal deviation and hypertrophy of each turbinate or in concha bullosa or bulla Ethmoidalis. Another important inclusion criterion was a positive Lidocaine test (more than 50 % relief of the headache after putting cotton pledges soaked in lidocaine 5 % in the nose at the site of the contact points for at least 15 min). Therefore, seven patients with less than fifty percent reduction in headache were omitted from the study.

All patients had been on medical treatment for at least 6 months (Nasal corticosteroid (nasal spray Fluticasone 2 puff daily), decongestant (Tablet Pseudoephedrine 1TDS for 1 week), and normal saline washing) and only entered the study if they were resistant to this medical treatment.

### Exclusion Criteria

All patients underwent a complete neurological and psychological evaluation and also if indicated, other related assessments and in case of a positive finding, even in the past history, the patients was excluded from the study. Patients were also excluded if they had history of sinusitis in the past 6 month, severe allergy, or a history of any surgery on the nose or the sinus. Accordingly, all patients were undergone nasal endoscopy and CT scan to reveal any sign of sinusitis and also ARIA (Allergic Rhinitis and its Impact on Asthma) guideline was used to detect sever allergy). Moreover, the existence of any head and neck or brain benign or malignant tumor, systemic or autoimmune disorder, any contraindication for medical or surgical

treatment (such as pregnancy) excluded the patients from this research.

### Ethical Approval

The protocol of this study was approved by the Institutional Review Board of the Tehran University of Medical Sciences. Detailed information about the study was given to the participants and a written informed consent was obtained from each one. All aspects of the study were conducted according to the Declaration of Helsinki. The safety and efficacy of the endoscopic surgery was confirmed as a standard treatment tool.

### Subjects' Variables and Follow-up Period

Demographic data, nasal endoscopy and coronal para nasal sinus CT scan characteristics, type of surgery, and complications of medical or surgical treatment were evaluated. Also, the severity of nasal obstruction and headache was expressed according to VAS (Visual Analogue Scale, 0: no symptom of headache or nasal obstruction and 10: the severest symptoms).

The follow-up period was at least 12 months. The severity of headache and nasal obstruction was assessed preoperatively and 1, 6, and 12 months after surgery. Also, nasal endoscopy was performed preoperatively and 1, 6, and 12 months after surgery.

### Procedures and Technique

All procedures were carried out using the same technique by one of the senior authors.



**Fig. 1** Septal deviation and contact point

Endoscopic surgery was the common method concha bullosa resection and most of septoplasty, except for two patients with severe septal deviation and their surgery were performed in conventional techniques (Fig. 1).

Shaver was used for turbinoplasty (Medtronic Company, USA, Minneapolis). Concha bullosa resection was the resection of the lateral bony part of the middle turbinate in all cases and if some parts of the contact points remained after resection, the procedure included those parts, like the uncinete process or ethmoid bulla resection (Fig. 2).

A silastic sheet was placed in the nasal cavity, but no packing was used after surgery. Normal saline douche and antibiotic were prescribed for all patients in the postoperative period for 5 days.

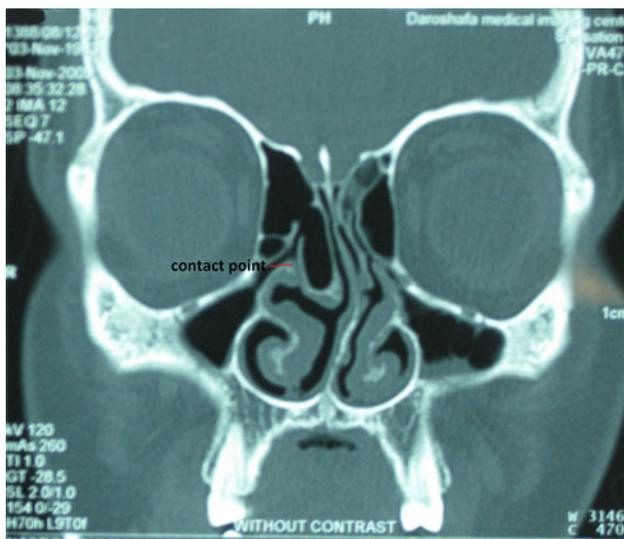
**Statistical Method**

Data was analyzed using SPSS 15.0 for Windows. “Paired *t* test” was used for the evaluation of variables means in each group. Analysis of correlation was done through Spearman correlation method. The values were evaluated using descriptive statistical methods (mean ± SD) and the results were expressed at a significance level of *p* < 0.05.

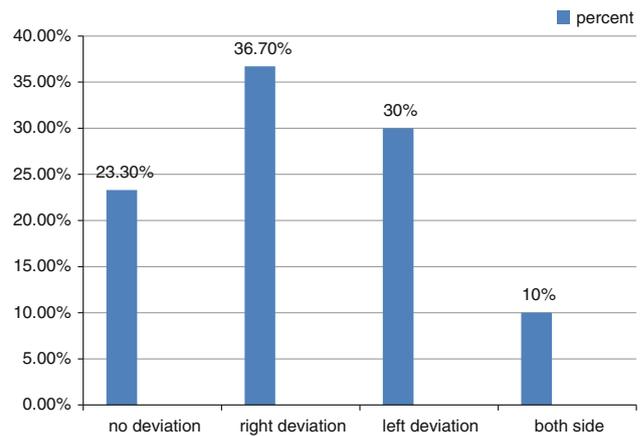
**Results**

Among 30 patient who entered this research, 16 (53.3 %) were female and the rest of them (46.7 %) were male. Their mean age was 31.1 ± 12.6 (min = 17, max = 61).

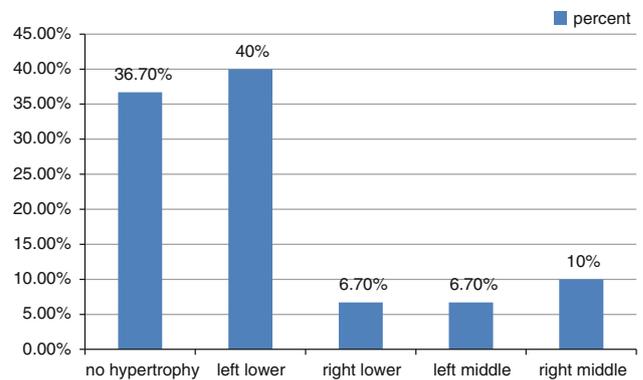
Patients expressed the severity of their headache according to VAS with a mean of 7.4 ± 1.4 and their mean nasal obstruction symptom according to VAS in the



**Fig. 2** Concha bullosa contact point



**Fig. 3** Frequency and type of septal deviation

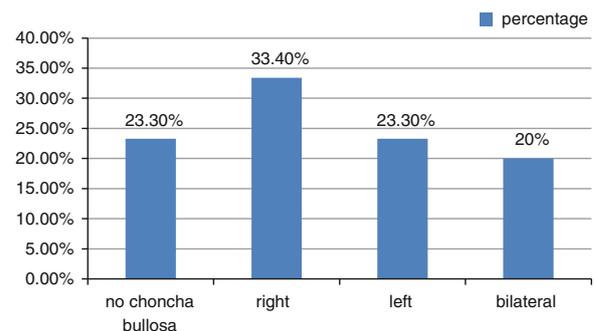


**Fig. 4** Frequency and location of turbinate hypertrophy

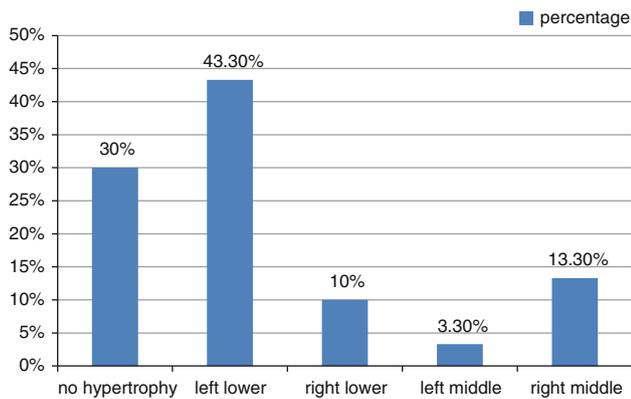
preoperative period was 7.9 ± 2.5. Septum status of the patients is shown in Fig. 3.

Another important feature is nasal endoscopy was turbinate hypertrophy which is depicted in Fig. 4.

All patients also underwent Para nasal CT scan and findings showed that the frequency of septal deviation was similar to the frequency obtained by nasal endoscopy. The



**Fig. 5** Distribution of concha bullosa according to CT finding



**Fig. 6** Distribution of concha hypertrophy according to CT finding

distribution of concha bullosa and turbinate hypertrophy are illustrated in Figs. 5 and 6.

Besides the above mentioned abnormalities, one of our patients had small retention cyst and the other one had slight mucosal hypertrophy in maxillary sinus, but because they were not symptomatic, we didn't do any further treatment for them.

Before surgery, all patients underwent medical treatment for at least 6 months with a mean duration of  $18.2 \pm 6.1$  months (min = 12 and max = 33).

After surgery, the status of the headache was assessed after 1, 6, and 12 months. The values according to VAS and their difference with the preoperative value are demonstrated in Table 1.

Comparison between post operative one-month and six-month mean VAS showed no significant difference ( $p = 0.17$ ), but the difference between post operative six-month and one-year mean VAS was significant ( $t$  test,  $p = 0.014$ ).

The outcome of surgery for reducing nasal obstruction was significant ( $p < 0.001$ ) in the three evaluation periods and the effect was stable (the difference between them was not significant).

Also, the distribution of surgical procedures was summarized in Table 2.

The patients did not report any side effects of the medical treatment, but five of them showed nasal endoscopic surgery complications after 6 months; 4 (13.3 %)

cases developed synechia and 1 (3.3 %) individual had septal perforation. Among the above mentioned complicated patients, only one of them who had synechia between left inferior turbinate and septum had complain of nasal obstruction, but the rest of them had no complain of headache or nasal obstruction. Accordingly, the before mentioned case and the other patient who had synechia between middle turbinate and lateral side of the nose were undergone revision surgery with local anesthesia to release synechia, which were successful. But the other cases, who had synechia between medial side of middle turbinate and septum left without any intervention.

Also, as previously was pointed out, one of our cases had septal perforation in the posterior part of septum as a result of endoscopic septoplasty. But we did not do anything for it, because it was small and asymptomatic.

Among our patients, only two patients were non-responsive to treatment. As a result, the success rate was 93.3 %. The difference between preoperative and one-month post operative VAS for headache and nasal obstruction was  $3.27 \pm 2.16$  and  $6.17 \pm 2.18$  respectively and both showed a normal distribution (Kolomogorov–Smirnov). We could not find any significant relationship between age and sex and the mentioned indexes (nasal obstruction and headache according to VAS) ( $t$  test). Moreover, Spearman test did not show a significant relationship between response of the headache and nasal obstruction, and sex and age.

The relationship between the types of surgery and the difference in headache and nasal obstruction is summarized in Table 3.

There was no significant difference between different sites of the contact points and response to surgery ( $p = 0.175$ ) or the stability of the response after 6 months ( $p = 0.28$ ) and 1 year ( $p = 0.48$ ).

## Discussion

The existence and also the most effective treatment for patients with a sinus headache without sinusitis is a debatable topic [4, 5, 10, 16, 19–21]. Also, the exact mechanism of this process remains unclear, although

**Table 1** Headache response to surgery

Time from Surgery	Headache (VAS)		
	Mean $\pm$ SD	Range (max–min)	$p$ value $t$ test
Before surgery	$7.4 \pm 1.4$	5–10	–
1 month after surgery	$4.1 \pm 1.9$	1–9	$p < 0.001$
6 months after surgery	$3.96 \pm 2.1$	1–9	$p = 0.014$
12 months after surgery	$4.8 \pm 2.3$	2–8	$p < 0.001$

**Table 2** Distribution of surgical procedures

Types of procedures	Number (%)
Concha bullosa resection	24 (80 %)
Septoplasty	
Endoscopic	16 (53.3 %)
Conventional	7 (23.3 %)
Turbinoplasty	21 (70 %)

substance P is thought to play a role in this referral cephalalgia. This theory was first described by Stammberger and Wolf, who stated that the release of that neuropeptide in the end neurons of C fibers in the nose and sinus area, secondary to any thermal, toxic substances, infection, and/or mechanical stimuli, can cause the sensation of pain in the affected area [16, 17, 20].

On the other hand, the reported treatment results of this so-called condition are variable [18]. The overall success rate of our series was 93.3 % which was comparable to other results [15, 17, 19]. Despite this improvement, the overall status head ache after surgery was  $4.8 \pm 2.3$  according to VAS. Accordingly, a Visual Analogue Scale measurement for headaches is only a crude scale and the severity and frequency of headaches, medication usage and, lost work is the other important headache characteristics which should be taken into account for assessment. Therefore, future studies with more focus on individuality of headache should be done.

Most of our patients considered their headaches as a significant problem (mean VAS = 7.4). Therefore, it could be predicted that the relief of their symptoms could promise them a better life quality. Moreover, the one-year follow-up period of this study confirmed the durability of the response; however, studies with longer follow-up periods are needed to show the pattern of the recurrence after treatment.

Considering the report of Soler et al. [22], resulted in headache as a common associated problem of chronic sinusitis which has disabling effect on healthiness of involved patients. Accordingly, despite conspicuous progress of other allied sinusitis symptoms, headache was the refractory symptoms to treatment in their series. Therefore, the above mentioned improvement of headache in sinus associated disease is substantial.

Among different sites of contact point, the middle and the inferior turbinate had a significant relationship with treatment which proved the effectiveness of treatment for these sites. No significant relationship between treatment and other sites of contact point has been shown maybe because there are not many patients whose contact points are at other sites which results in a small sample size.

We believe that the acceptable success rate of this survey lay in the strict inclusion and exclusion criteria for selecting patients. Moreover, we put emphasis on preoperative medical treatment because it could eliminate reversible parts (mucosal contact points). Also, considering the various causes of headache, it was absolutely necessary to rule out other origins before diagnosis. Additionally, it has been shown that the Lidocaine test plays an essential role in final identification of the rhinogenic headache [17]. Needless to say that all the aforementioned stages (CT scan, nasal endoscopy, Lidocaine test) were necessary for validating the rhinogenic source of the headache because of the fact that nasal cycle can mimic any form of contact points which are not permanent [21].

Therefore, it seems that surgery can be used in selected headache patients. However, we believe that studies with longer follow-up periods should be designed to evaluate the sustainability of the response and also to answer another controversial issue which is the role of the different sites of contact point in predicting final results although we could not find any significant relationships.

**Table 3** Relationship between types of surgery, headache and nasal obstruction

Variable	Difference					
	Status of the variable	Mean difference of the headache	<i>p</i> value <sup>a</sup>	Mean difference of nasal obstruction	Mean difference of nasal obstruction	<i>p</i> value <sup>a</sup>
Septoplasty	Positive	$3.6 \pm 2.5$	0.218	Positive	$7.27 \pm 1.7$	0.011*
	Negative	$2.28 \pm 1.25$		Negative	$5.14 \pm 1.2$	
Concha bullosa resection	Positive	$4.14 \pm 1.8$	0.041*	Positive	$6.3 \pm 1.9$	0.251
	Negative	$2.4 \pm 1.7$		Negative	$5.2 \pm 1.8$	
Turbinoplasty	Positive	$4.7 \pm 2.3$	0.004*	Positive	$6.8 \pm 1.8$	0.048*
	Negative	$2.1 \pm 1.4$		Negative	$5.4 \pm 1.6$	

\* Significant difference

<sup>a</sup> *t* Test

## Conclusion

If there is strong clinical suspicion and meticulous selection criteria, provided that other causes of headache have been ruled out, endoscopic management of the rhinogenic headache can be effective.

- Endoscopic management of the rhinogenic headache can be effective in selective cases.
- Medical management should be considered before any surgical interventions.

## References

1. Tosun F, Gerek M, Ozkaptan Y (2003) Nasal surgery for contact point headaches. *Headache* 40:237–240
2. Parsons D, Batra P (1998) Functional endoscopic sinus surgical outcomes for contact point headaches. *Laryngoscope* 108:696–702
3. Kari E, DelGaudio J (2008) Treatment of sinus headache as migraine: the diagnostic utility of triptans. *Laryngoscope* 118:2235–2239
4. Cady R, Dodick D, Levine H (2005) Sinus headache: a neurology, otolaryngology, allergy, and primary care consensus on diagnosis and treatment. *Mayo Clin Proc* 80:908–916
5. Silberstein S (2004) Headaches due to nasal and paranasal sinus disease. *Neurol Clin* 22:1–19
6. Chow JM (1994) Rhinologic headaches. *Otolaryngol Head Neck Surg* 111:211–218
7. Schor D (1993) Headache and facial pain—the role of the paranasal sinuses: a literature review. *Cranio* 11:36–47
8. Welge L, Rolf H, Schmid N (2003) Endonasal surgery for contact point headaches: a 10-year longitudinal study. *Laryngoscope* 113:2151–2156
9. Curtis S, Susan H, Christopher W (2004) Prevalence of migraine in patients with a history of self-reported or physician-diagnosed “sinus” headache. *Arch Intern Med* 164:1769–1772
10. Abu-Bakra M, Jones NS (2001) Prevalence of nasal mucosal contact points in patients with facial pain compared with patients without facial pain. *J Laryngol Otol* 115:629–632
11. Behin F, Behin B, Baredes S (2005) Surgical management of contact point headaches. *Headache* 45(3):204–210
12. Jones N (2009) Sinus headaches: avoiding over and misdiagnosis. *Expert Rev Neurother* 9:439–444
13. Mariotti LJ, Setliff RC, Ghaderi M, Voth S (2009) Patient history and CT findings in predicting surgical outcomes for patients with rhinogenic headache. *Ear Nose Throat J* 88:926–929
14. Ramadan HH (1999) Nonsurgical versus endoscopic sinonasal surgery for rhinogenic headache. *Am J Rhinol* 13:455–457
15. Phillips J, Vowler S, Salam M (2007) Endoscopic sinus surgery for ‘sinus headache’. *Rhinology* 45:14–19
16. Abu-Bakra M, Jones N (2001) Does stimulation of nasal mucosa cause referred pain to the face. *Clin Otolaryngol Allied Sci* 26:430–432
17. Mohebbi A, Memari F, Mohebbi S (2009) Endonasal endoscopic management of contact point headache and diagnostic criteria. *Headache* 50:242–248
18. Campos A, Solomons NB, Armengot M (1998) Role of nasosinusal endoscopic surgery in the treatment of headache and facial pain of rhinogenic origin. *Acta Otorrinolaringol Esp* 49:615–620
19. Senocak D, Senocak M (2004) Sinonasal pathology and headaches. *Rhinology* 42:8–14
20. Roger K, Curtis P (2009) Sinus problems as a cause of headache refractoriness and migraine chronification. *Curr Pain Headache Rep* 13:319–325
21. Mehle M, Kremer P (2008) Sinus CT scan findings in “sinus headache” migraineurs. *Headache* 48:67–71
22. Soler ZM, Mace J, Smith TL (2008) Symptom-based presentation of chronic rhinosinusitis and symptom-specific outcomes after endoscopic sinus surgery. *Am J Rhinol* 22:297–301