Mucosal contact point headache – a true clinical entity?

Review Article

Authors

Leonor Oliveira
Hospital Garcia de Orta, Unidade Local de Saúde Almada-Seixal, Portugal

Ana Miguel Couto
Hospital Garcia de Orta, Unidade Local de Saúde Almada-Seixal, Portugal

Joana Dias
Hospital Garcia de Orta, Unidade Local de Saúde Almada-Seixal, Portugal

Mariana Branco Lopes
Hospital Garcia de Orta, Unidade Local de Saúde Almada-Seixal, Portugal

Carla André
Hospital Garcia de Orta, Unidade Local de Saúde Almada-Seixal, Portugal

Luís Antunes
Hospital Garcia de Orta, Unidade Local de Saúde Almada-Seixal, Portugal

Correspondence:
Leonor Oliveira
leonoroliveira25@gmail.com

Article received on May 8, 2025.
Accepted for publication on January 8, 2025.

Abstract

Introduction: Rhinogenic headache, as classified by the International Classification of Headache Disorders (ICHD), encompasses headaches originating from sinonasal pathology. One of the most debated etiologies is mucosal contact point headache, a controversial entity that was removed from the ICHD-3 in 2018.

Objectives: To determine whether mucosal contact points represent a true clinical entity and whether their surgical correction is effective in resolving headache symptoms.

Materials and Methods: Systematic review according to PRISMA standards. Searches were conducted on the PubMed platform using "rhinogenic headache" and "contact point headache" in English and Portuguese, with no date restrictions. Studies evaluating the prevalence of mucosal contact points and their association with headache, as well as studies reporting clinical outcomes of patients undergoing surgical treatment, were included.

Results: Of the 220 articles initially identified, 80 were potentially eligible for both objectives of this review, and 33 met inclusion criteria. Most studies reported significant pain improvement, with a reduction in Visual Analog Scale (VAS). However, they have several limitations, such as small sample sizes (≤50 patients) and short follow-up (<24 months).

Conclusions: Mucosal contact points should be considered a potential etiology in cases of refractory headache. Some patients may benefit from surgical correction to eliminate mucosal contact; however, it is important to manage patient expectations, as current evidence is limited by methodological bias and study heterogeneity. Randomized clinical trials with larger sample sizes and longer follow-up are needed.

Keywords: rhinogenic headache, mucosal contact point, controversy

Introduction

Headache is a common symptom in the general population and frequently leads patients to seek evaluation by an otolaryngologist (ENT specialist). Headaches have multiple etiologies, including rhinogenic causes such as sinonasal disease, which is recognized in the *International Classification of Headache Disorders* (ICHD) and occurs in association with acute or chronic rhinosinusitis.

One of the most debated etiologies of rhinogenic headache is rhinogenic contact point headache. This was included in the ICHD-2 (2004)[1] and is characterized by intermittent pain in the orbital or medial epicanthal region, with evidence of a mucosal contact point on nasal endoscopy or computed tomography (CT), complete pain relief within 5 minutes of applying topical anesthesia to the inferior turbinate, with the pain disappearing within 7 days and not recurring after surgical removal of the mucosal contact points. However, this remains a controversial entity with limited evidence. Consequently, in 2018, the ICHD-3 ceased to recognize it as a specific isolated entity, integrating it into the broader category: "Headache attributed to disorder of the nasal mucosa, turbinates, or septum" (A11.5.3).

This systematic review aims to determine whether mucosal contact points are a true etiological entity of rhinogenic headaches (objective 1) and whether their surgical correction is effective in resolving pain (objective 2).

Definition and Pathophysiology[2,3]

Rhinogenic headaches, as the name implies, originate in the nasal cavity. Mucosal contact point headache occurs through the stimulation of the inferior or middle turbinate and the nasal septum, both of which are innervated by the anterior ethmoidal nerve, a branch of the trigeminal nerve (V). The pain resulting from this contact point with the mucosa of the sinonasal cavity is not felt locally but is frequently referred to the dermatomes of the trigeminal nerve branches, particularly in the medial epicanthus and supraorbital region.

The proposed mechanism for this referred pain is the production of substance P following a mechanical stimulus, such as a septal spur or concha bullosa. Creating this contact point between mucosal surfaces triggers the production of substance P, leading to vasodilation and inflammation. This results in an axonal reflex where two distinct afferent neurons—one with a receptor in the nasal mucosa and the other in the skin of the frontal region and medial epicanthus—synapse with the same trigeminal sensory neuron. Consequently, the sensory cortex misinterprets nasal mucosal stimulation as originating from the skin, referring pain to the glabella or supraorbital region.

Materials and Methods

A research protocol was drafted following a search in the PubMed database in March 2025 using the terms "contact point headache" or "rhinogenic headache." Only articles in English and Portuguese were selected; titles and abstracts were reviewed, and duplicates were removed. To address objective 1, we included observational and comparative studies evaluating the incidence of mucosal contact points and their association with headaches, including studies with asymptomatic patients. For objective 2, observational studies, case series reports, and clinical trials reporting surgical outcomes in patients with rhinogenic contact point headache were included. Narrative and systematic reviews as well as studies evaluating only medical treatment were excluded. Two reviewers independently selected the articles, resolving any discrepancies by consensus. We extracted data separately for each objective; Table 1 shows the data for objective 2.

An adapted Newcastle-Ottawa tool for observational studies was used, showing a moderate to high risk of bias in most articles.

Due to study heterogeneity, we did not perform a meta-analysis but instead conducted a descriptive analysis for both objectives, with the results presented in a narrative and tabular form.

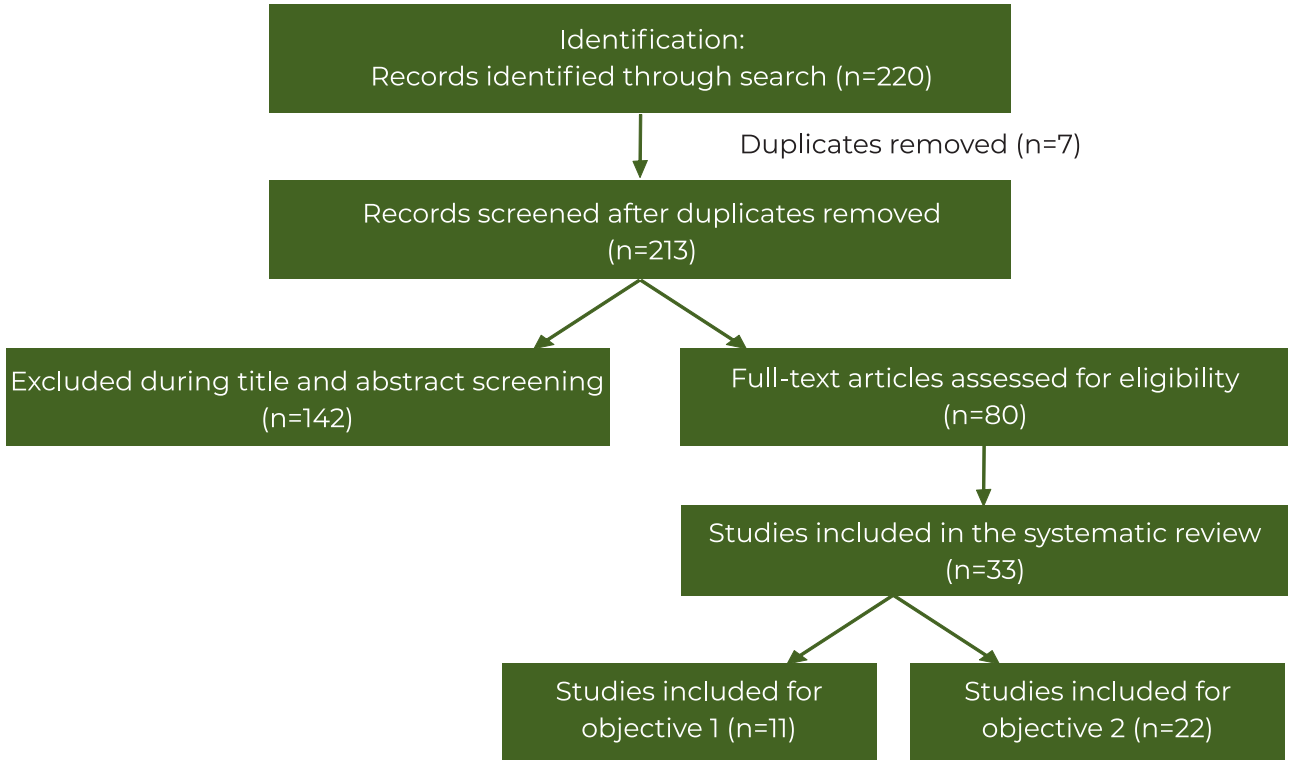
Table 1
Data evaluated for objective 2 – Surgical outcomes

Data Extraction
Year
Sample
Average age
Male-to-female ratio
Use of the lidocaine test
Results
Follow-up duration

Results

After removing duplicates and applying the inclusion criteria, 33 of the 220 identified articles were selected based on the study objectives: 11 articles for objective 1 (Table 2) and 22 for objective 2 (~1500 patients) [Table 3; Fig. 1]. Regarding objective 1, 11 articles were identified, including observational studies showing that mucosal contact points are present in 20%-50% of asymptomatic individuals and up to 60% of symptomatic individuals, making it difficult to establish causality. Lidocaine block tests were used in some cases, but were not universally applied. Several observational studies, such as *Herzallah (2015)*,[4] *Roozbahany (2013)*,[5] *and Abu-Bakra (2001)*,[6] reported a significantly higher incidence of mucosal contact points in patients with facial pain or headaches compared to control groups. These findings suggest a relevant clinical association, although they do not prove causality on their own. Additionally, *Zhao (2016)*,[7] *Eyigör (2020)*,[8] and *Demir (2016)*[9] demonstrated elevated levels of substance P and inflammatory neuropeptides in the mucosal contact zones of symptomatic patients, supporting a possible pathophysiological mechanism of local nociceptive activation consistent with referred pain. Other studies, such as *Mariotti (2009)*,[10] observed that imaging findings (CT) and endoscopic evaluation are useful in predicting symptoms when mucosal contact is present, reinforcing the clinical value of a structured diagnosis. However, standardized diagnostic criteria remain scarce and heterogeneous despite efforts toward standardization[11].

Figure 1
Flowchart according to PRISMA guidelines



An additional 22 articles were analyzed regarding the efficacy of surgical treatment for rhinogenic contact point headaches (objective 2). The average sample size in these articles was 68 patients, ranging from 12 to 302 patients. The mean age of the patients ranged from 27 to 45 years, with no sex predominance. Most of the analyzed studies showed a significant improvement in rhinogenic headache after surgical intervention, using the Visual Analog Scale (VAS) to quantify pre- and postoperative pain. The average reduction in VAS scores ranged from 3 to 6 points, representing a clinically relevant reduction in pain. The lidocaine test was used in several studies as a diagnostic test to predict a good surgical response. Follow-up ranged from 6 to 120 months. Among the different studies analyzed, septal spurs and concha bullosa were the most prevalent anatomical alterations and were considered the most common causes of rhinogenic contact point headaches.[12,13,14]

Among the articles analyzed in this review, *Tosun et al (2000)*[15] evaluated subjective pain improvement in 30 patients with contact points and no other cause for headache, concluding that surgery led to complete pain resolution in 43% and a significant reduction in pain intensity in 47% over a follow-up period of up to 41 months. Similarly, *Welge-Luessen et al. (2003)*[16] reached comparable conclusions, with 65% of the 20 study patients achieving complete pain resolution. These findings were supported by more recent studies, such as *Giacomini et al. (2003)*[17], *Bektas et al. (2010)*[12], *Abu-Samra et al (2011)*[18], *Sadeghi et al (2013)*[19], *Cantone et al. (2014)*[20], *Peric et al. (2016)*[13], and *Lakshmanan et al. (2022)*[14], which showed a reduction in the VAS pain scores following surgical treatment. Other studies using control groups to compare surgical vs. non-surgical cohorts, such as *Yazici et al.* (2010)[21], *La Mantia et al. (2018)*[22], *Altin et al. (2019)*[23], and *Folic et al. (2021)*[24], concluded that surgery was superior to medical treatment, with surgical groups showing a greater reduction in VAS pain scores after treatment. Conversely, *Novak et al. (1992)*[25] and *Abu-Samra et al. (2011)*[18], included only patients with mucosal contact points and an established diagnosis of primary headache medically refractory to treatment, such as migraine or tension-type headache. They concluded that surgical correction of these contact points reduced the frequency of headache attacks.

Discussion

Studies in the literature show reasonable evidence linking mucosal contact points to rhinogenic headache, supported by anatomical, epidemiological, and pathophysiological data. However, a causal relationship is not yet fully established, and the lack of specific biomarkers or uniform criteria makes it difficult to define this as a distinct nosological entity. A growing body of research supports the hypothesis that mucosal contact points may be involved in the development of certain types of rhinogenic headache. However, there is some disagreement regarding rhinogenic headaches. *Abu-Bakra et al. (2011)*[6], *Mendonça et al. (2005)*[26], and *Wang et al. (2016)*[27] concluded that mucosal contact points occur in both symptomatic and asymptomatic patients (Figs. 2 and 3), and in symptomatic patients with unilateral pain, mucosal contact points were also observed on the contralateral side in 50% of cases. The presence of asymptomatic patients with nasal anatomical deformities indicates multiple mechanisms and multifactorial etiological implications that are not yet fully understood, which complicates the diagnosis and the correlation of symptoms with anatomical results. Conversely, mucosal contact does not cause pain anywhere else in the body. These factors raise questions about this clinical entity and its pathophysiology, suggesting that mucosal contact points alone are insufficient to explain the clinical presentation. Although several studies, such as *Kwon et al* (2020)[28], indicate that patients with mucosal contact points experience more pain, surgical efficacy remains controversial. Till date, studies have not yielded statistically significant evidence of symptom improvement to support surgical intervention.

Figure 2
Septal spur in a patient without headache

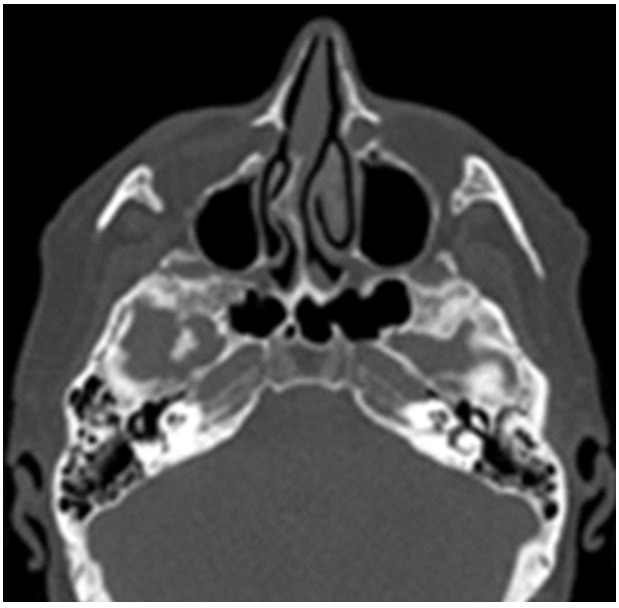
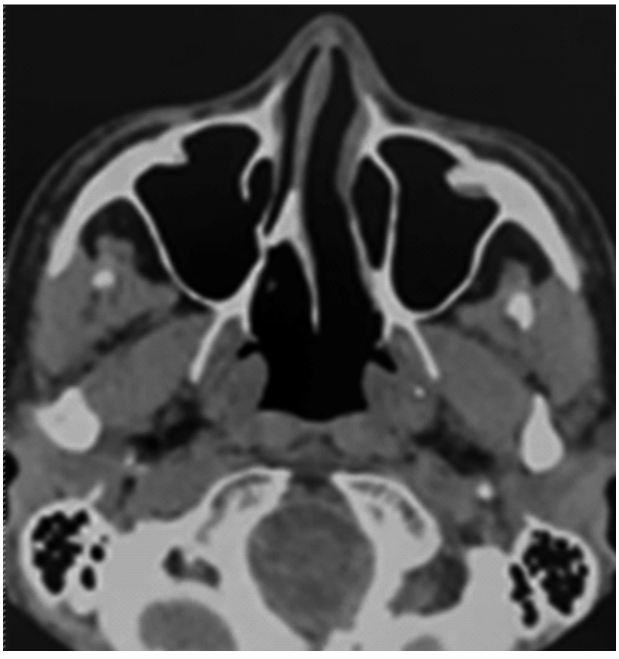


Figure 3
Septal spur in a patient with headache



Regarding objective 2, several studies show promising results for surgical correction in resolving rhinogenic contact point headaches. Furthermore, mucosal contact can trigger primary headache attacks,[18,25] justifying the use of surgical correction in these cases.

However, these studies have several drawbacks that raise questions about their results, such as the high variability in surgical approaches, inclusion criteria, and outcome assessment methods, which limits comparability among the studies. Furthermore, these studies have very small sample sizes, averaging 20 to 50 patients. Most of these studies have weak methodologies, lack randomization, use poorly defined selection criteria, and few include control groups. Another limitation of these studies, noted by several authors, is the follow-up time of the patients, which averaged 24 months, preventing any conclusions regarding the durability of the results.

The possibility of publication bias should also be acknowledged. The fact that all the included studies showed results favorable to surgical intervention does not necessarily imply that efficacy is uniform. In controversial topics with high methodological variability such as this, it is possible that studies with negative or inconclusive results were not published or were suspended before completion. Therefore, these positive findings should be interpreted with caution, acknowledging that the available literature may not fully reflect reality. Thus, considering the limitations of the studies, authors such as *Abu-Samra et al. (2011)[18], La Mantia et al. (2018)[22]* and *Folic et al. (2021)[24]* indicate that these results may be overestimated due to mechanisms such as cognitive dissonance, a psychological phenomenon involving unconscious self-justification. Patients develop expectations regarding the surgery, and so as not to feel their effort, hope, and even financial investment were in vain, they may perceive an improvement even if their pain has not significantly changed. Over time, they forget their initial expectations and begin to assess their outcomes more objectively. This highlights the importance of long-term follow-up, reinforcing the limitations of the presented studies. Neurological stimulation induced by surgery is another phenomenon that seems to explain the positive results of these studies. Surgery itself temporarily alters the nervous system activity, triggering an adaptive response (neuroplasticity). This

"reprograms" how the brain processes pain, explaining the reduction in pain during the postoperative period. However, this process may be temporary if the underlying cause is not fully resolved. [18,22,24] Despite the study limitations and disagreements, the promising results in medically refractory headaches demonstrate that surgery should be considered for carefully selected patients, indicating that mucosal contact points play a role in their pathophysiology and may even function as a possible trigger for attacks.

Conclusions

Rhinogenic headache remains a controversial entity with limited supporting evidence. Further studies with larger sample sizes, appropriate control groups, and long-term follow-up are needed to obtain more robust and reliable results. Nevertheless, surgery may be considered in selected cases, using an individualized approach based on the patient's symptoms and their impact on the quality of life. It is important to manage patient expectations, discuss the risks, benefits, and available treatment options, and clearly explain that surgery may or may not completely resolve the symptoms.

Conflicts of Interest

The authors declare that there is no conflict of interests regarding the publication of this paper.

Data Confidentiality

The authors declare having followed the protocols in use at their working center regarding patients' data publication.

Protection of humans and animals

The authors declare that the procedures were followed according to the regulations established by the Clinical Research and Ethics Committee and to the 2013 Helsinki Declaration of the World Medical Association.

Privacy policy, informed consent and Ethics Committee Authorization

The authors declare that they have written consent for the use of photographs of patients in this article.

Funding Sources

This work did not receive any contribution, funding or scholarship.

Availability of scientific data

There are no datasets available, publicly related to this work.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

Durante a preparação deste trabalho, os autores utilizaram a ferramenta ChatGPT para criação do fluxograma segundo as normas PRISMA e da tabela "Checklist PRISMA", posteriormente revistos e editados conforme necessário, assumindo total responsabilidade pelo conteúdo da publicação.

Referências bibliográficas

1.Olesen J, Goadsby P, Steiner T. The International Classification of Headache Disorders: 2nd edition. Lancet Neurol. 2003 Dec; 2 (12): 720

2.Stammberger H, Wolf G. Headaches, and sinus disease: the endoscopic approach. Ann Otol Rhinol Laryngol Suppl. 1988 Sep-Oct:134:3-23. doi: 10.1177/00034894880970s501.

3.Bernichi JV, Rizzo VL, Villa JF, Santos RF, Caparroz FA. Rhinogenic and sinus headache – literature review. Am J Otolaryngol. 2021 Nov-Dec;42(6):103113. doi: 10.1016/j.amjoto.2021.103113.

4.Herzallah IR, Hamed MA, Salem SM, Suurna MV. Mucosal contact points and paranasal sinus pneumatization: does radiology predict headache causality? Laryngoscope. 2015 Sep;125(9):2021-6. doi: 10.1002/lary.25194.

5.Roozbahany NA, Nasri S. Nasal and paranasal sinus anatomical variations in patients with rhinogenic contact point headache. Auris Nasus Larynx 2013 Apr;40(2):177-83. doi: 10.1016/j.anl.2012.07.007 .

6.Abu-Bakra M, Jones NS. Prevalence of nasal mucosal contact points in patients with facial pain compared with patients without facial pain. J Laryngol Otol. 2001 Aug;115(8):629-32. doi: 10.1258/0022215011908685

7.Zhao G, Yin J, Peng H, Wang J. Analysis on correlation between SP and NK-1R and intranasal mucosal contact point headache. Acta Otolaryngol 2016;136(5):522-7. doi: 10.3109/00016489.2015.1128122.

8.Eyigör H, Eyigör M, Erol B, Selçuk ÖT, Renda L, Yılmaz MD. et al. Changes in substance P levels of inferior turbinate in patients with mucosal contact headache. Braz J Otorhinolaryngol 2020 Jul-Aug;86(4):450-455. doi: 10.1016/j.

bjorl.2019.01.006.
9.Demir D, Cengiz N, Güven M, Bulduk O. An analysis of neuropeptides at nasal contact points of patients with secondary headache. J Craniofac Surg. 2016 May;27(3):e305-9. doi: 10.1097/SCS.0000000000002553.
10.Mariotti LJ, Setliff RC 3rd, Ghaderi M, Voth S. Patient history and Ct findings in predicting surgical outcomes for patients with rhinogenic headache. Ear Nose Throat J. 2009 May;88(5):926-9.
11.Yi HS, Kwak CY, Kim HI, Kim HY, Han DS. Rhinogenic headache: standardization of terminologies used for headaches arising from problems in the nose and nasal cavity. J Craniofac Surg. 2018 Nov;29(8):2206-2210. doi: 10.1097/SCS.0000000000004942.
12.Bektas D, Alioglu Z, Akyol N, Ural A, Bahadir O, Caylan R. Surgical outcomes for rhinogenic contact point headaches. Med Princ Pract. 2011;20(1):29-33. doi: 10.1159/000322076.
13. Peric A, Rasic D, Grgurevic U. Surgical treatment of rhinogenic contact point headache: an experience from a tertiary care hospital. Int Arch Otorhinolaryngol. 2016 Apr;20(2):166-71. doi: 10.1055/s-0036-1578808.
14.Lakshmanan S, Singh U, Zaffrullah NS, Manimaran V. Clinical outcome following endoscopic septoturbinal surgeries for rhinogenic contact point headache: a retrospective analysis. Indian J Otolaryngol Head Neck Surg. 2022 Oct;74(Suppl 2):780-784. doi: 10.1007/s12070-020-01825-w.
15.Tosun F, Gerek M, Ozkaptan Y. Nasal surgery for contact point headaches. Headache. 2000 Mar;40(3):237-40. doi: 10.1046/j.1526-4610.2000.00034.x.
16.Welge-Luessen A, Hauser R, Schmid N, Kappos L, Probst R. Endonasal surgery for contact point headaches: a 10-year longitudinal study. Laryngoscope. 2003 Dec;113(12):2151-6. doi: 10.1097/00005537-200312000-00019.
17.Giacomini PG, Alessandrini M, DePadova A. Septoturbinal surgery in contact point headache syndrome: long-term results. Cranio. 2003 Apr;21(2):130-5. doi: 10.1080/08869634.2003.11746241.
18.Abu-Samra M, Gawad OA, Agha M. The outcomes for nasal contact point surgeries in patients with unsatisfactory response to chronic daily headache medications. Eur Arch Otorhinolaryngol. 2011 Sep;268(9):1299-304. doi: 10.1007/s00405-011-1590-2.
19.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 Aug;65(Suppl 2):415-20. doi: 10.1007/s12070-013-0629-7.
20.Cantone E, Castagna G, Ferranti I, Cimmino M, Sicignano S, Rega F. et al. Concha bullosa related headache disability. Eur Rev Med Pharmacol Sci. 2015 Jul;19(13):2327-30.
21.Yazici ZM, Cabalar M, Sayin I, Kayhan FT, Gurer E, Yayla V. Rhinologic evaluation in patient with primary headache. J Craniofac Surg. 2010 Nov;21(6):1688-91. doi: 10.1097/SCS.0b013e3181f3c666.
22.La Mantia I, Grillo C, Andaloro C. Rhinogenic contact point headache: surgical treatment versus medical treatment. J Craniofac Surg. 2018 May;29(3):e228-e230. doi: 10.1097/SCS.0000000000004211.
23.Altin F, Haci C, Alimoglu Y, Yilmaz S. Is septoplasty effective rhinogenic headache in patients with isolated contact point between inferior turbinate and septal spur? Am J Otolaryngol. 2019 May-Jun;40(3):364-367. doi: 10.1016/j.amjoto.2019.02.002.
24.Folic MM, Barac AM, Ugrinovic AB, Jotic AD, Trivic AS, Milovanovic JP. et al. Effectiveness of the treatment of rhinogenic headache caused by intranasal contact. Ear Nose Throat J. 2023 Sep;102(9):605-610. doi: 10.1177/01455613211019706.
25.Novak VJ, Makek M. Pathogenesis and treatment of migraine and neurovascular headaches with rhinogenic trigger. Head Neck. 1992 Nov-Dec;14(6):467-72. doi: 10.1002/hed.2880140608.
26.Mendonça JC, Bussoloti Filho I. Cranio facial pain and anatomical abnormalities of the nasal cavities. Braz J Otorhinolaryngol. 2005 Jul-Aug;71(4):526-34. doi: 10.1016/s1808-8694(15)31211-8.
27.Wang J, Yin JS, Peng H. Investigation of diagnosis and surgical treatment of mucosal contact point headache. Ear Nose Throat J. 2016 Jun;95(6):E39-44.
28.Kwon SH, Lee EJ, Yeo CD, Kim MG, Kim JS, Noh SJ. et al. Is septal deviation associated with headache? A nationwide 10-year follow-up cohort study. Medicine (Baltimore). 2020 May;99(20):e20337. doi: 10.1097/MD.0000000000020337.
29.Shaikh A, Al Saey H, Ashkanani S, Alsulaiti M, Alduhirat E, Aljariri A. et al. Higher incidence of headache in patients with intermittent mucosal contact points between the septum and lateral nasal wall. Laryngoscope Investig Otolaryngol. 2021 Jun 8;6(4):607-612. doi: 10.1002/lio2.577.
30.Li Y Liu Z, Xu B, Jia H, Wang Y, Zhu Y. et al. Surgical management of mucosal contact headache. Am J Otolaryngol. 2022 Mar-Apr;43(2):103318. doi: 10.1016/j.amjoto.2021.103318.
31. Lavalle S, Pace A, Magliulo G, Lentini M, Lechien JR, Calvo-Henriquez C. et al. Impact of nasal anatomical variation subtype on surgical outcomes for rhinogenic contact point headache. Diagnostics (Basel). 2025 Jan 7;15(2):121. doi: 10.3390/diagnostics15020121.
32.Behin F, Behin B, Bigal ME, Lipton RB. Surgical treatment of patients with refractory migraine headaches and intranasal contact points. Cephalalgia. 2005 Jun;25(6):439-43. doi: 10.1111/j.1468-2982.2004.00877.x.
33.Parsons DS, Batra PS. Functional endoscopic sinus surgical outcomes for contact point headaches. Laryngoscope. 1998 May;108(5):696-702. doi: 10.1097/00005537-199805000-00013.
Behin F, Behin B, Behin D, Baredes S. Surgical management of contact point headaches. Headache: The Journal of Head and Face Pain. 2005 Mar; 45(3): 204–210. doi: 10.1111/j.1526-4610.2005.05045.x
34.Yarmohammadi ME, Ghasemi H, Pourfarzam S, Nadoushan MR, Majd SA. Effect of turbinoplasty in concha bullosa induced rhinogenic headache, a randomized clinical trial. J Res Med Sci. 2012 Mar;17(3):229-34.
35.Bilal N, Selcuk A, Karakus MF, Ikinciogullari A, Ensari S, Dere H. Impact of corrective rhinologic surgery on rhinogenic headache. J Craniofac Surg. 2013 Sep;24(5):1688-91. doi: 10.1097/SCS.0b013e31827c7d8f.
36.Cascio F, d'Alcontres FS, Costanzo D, Nicastro V, Stolfa A, Clemenzi V. et al. Centripetal endoscopic sinus surgery in rhinogenic headache. Am 2024 Nov-Dec;45(6):104473. doi: 10.1016/j.amjoto.2024.104473.