Surgical Management of Rhinogenic Contact Point Headaches

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Abstract

Objective: To evaluate the surgical outcome in patients diagnosed as having rhinogenic contact point headaches (RCPH). Patients and Methods: fifty four patients (aged 18– 50 years) with RCPH underwent different nasal surgical procedures. Patients' pain complaints were evaluated with a visual analog scale (VAS) both pre- and postoperatively. Results: All patients reported a decrease in the intensity of pain postoperatively. Twenty six patients (48.15%) reported complete relief. The difference between the preoperative and postoperative VAS pain scores was statistically very significant ($p < 0.01$). Conclusion: The removal of contact points in patients with RCPH usually alleviate headache in carefully selected patients.

Introduction

Patients who experience chronic head and face pain unresponsive to over-the-counter medication present a diagnostic and therapeutic challenge. These patients have no clinical or radiological inflammatory signs of rhinosinusitis, and they usually pay multiple visits to otorhinolaryngology, neurology, and/or ophthalmology clinics where their examinations reveal normal findings. Not too infrequently, they may be misdiagnosed and treated for rhinosinusitis, migraine, or vascular-type headaches.

Rhinogenic headache is a headache or facial pain syndrome secondary to mucosal contact points in the nasal/sinus cavities in the absence of inflammatory sino-nasal, purulent discharge, sino-nasal polyps, sino-nasal masses, or hyperplastic mucosa. It has multiple synonyms used frequently in the literature which include rhinopathic headache, sinogenic headache, middle turbinate headache, nasal spur headache, four finger headache, sinus headache, contact point headache, and Sluder headache [1].

Wolff showed that stimulation of the middle turbinate and the nasal septum caused pain in the medial canthus area and the supraorbital region [2]. Morgenstein and Krieger described a middle turbinate headache syndrome having a typical pattern of pain without being associated with any signs of sinus infection [3]. It did not take too long to recognize sinonasal abnormalities, such as septal spurs [4] and a pneumatized middle [5] or superior turbinate [6, 7].

The middle turbinate is a thin bony structure covered with mucosa on the lateral wall of the nose [8]. Its anterior part and the nasal septum are both supplied by the anterior ethmoidal nerve. RCPH is basically a referred pain and this concept is founded on the fact that two different afferent sensory neurons, one with its receptor in the nasal mucosa and the other in the skin of the temple, zygoma, forehead, and medial canthus area synapse on the same sensory neuron of the sensory nucleus of the fifth cranial nerve. Stimulation of the receptors in the nasal mucosa is misinterpreted by the sensory cortex as originating from the skin (referred pain to the glabellar or supraorbital region). Mucosal contact between the middle turbinate and the nasal septum or the lateral nasal wall is believed to be the causal factor of the stimulus. The stimulation of polymodal receptors within the nasal cavity initiates orthodromic and antidromic impulses. The orthodromic impulses carried through the C fibers mediate pain in the central nervous system. The antidromic impulses carried in a retrograde fashion result in the release of substance P at the receptor site causing local vasodilatation, hypersecretion, smooth muscle contraction, and the extravasation of plasma [9].

In the presence of anatomic variations without any signs of inflammatory disease, the narrowed spaces in the nose make up the predisposing areas for triggering the initial stimulus caused by swelling of the erectile tissue. The pneumatization of the middle turbinate causing it to expand is termed concha bullosa. It is the most common anatomic variation of the middle turbinate and is generally found bilaterally [10].

Other anatomic variations causing headache are the following: septal deviations, in particular a spur which may contact either the middle or inferior turbinate; other middle turbinate abnormalities, like a paradoxically bent middle turbinate, or a hypertrophied middle turbinate; a prominent ethmoid bulla; aeger nasi cells; and an abnormally bent uncinate process.

Any combination of the above or all of the above may cause headache, especially if contact points are noted [11].

Mucosal contact headache was added as a secondary headache disorder in the International Classification of Headache Disorders [12]. The guide described mucosal contact headache as variations in mucosal congestion mediated by gravitational changes. The criteria in the guide require the abolition of headache within 5 min following the application of topical anesthesia to the contact point area and significant improvement of the headache in less than 7 days after removal of the mucosal contact points.

This study was conducted to evaluate the surgical outcome of patients diagnosed and treated as having rhinogenic contact point headaches.

Patients and Methods

A total of 54 patients were diagnosed as having RCPH at the Department of Otolaryngology in Samarra General Hospital and private clinic for the period from February 2011 to May 2016. All patients underwent a preoperative evaluation including detailed medical history, a complete ENT examination, diagnostic nasal endoscopy, state and signs of allergy, and coronal CT scans of the nose and paranasal sinuses. Any sign of inflammatory disease such as nasal polyps or mucopurulent discharge as well as hyperplastic mucosa as noted during nasal endoscopy or on the CT scans required exclusion from the study group. Those patients with a diagnosis or a history of non-sinus headache causes such as migraine and other vascular disorders, chronic daily headache, neuralgias, cervical spine disorders, temporomandibular joint disorders, and ophthalmic refraction problems were also excluded from the study group. The patients were asked about the use of analgesics or other drugs and their adequacy for alleviating their complaints.

Diagnostic Criteria

The patients were initially screened on the basis of the following criteria for inclusion into the **study group:**

The major complaint was headache or facial pain described as chronic, recurrent, excruciating, and/or disabling over the glabellar area and/or extending over the middle canthus region and/or supraorbital area unilaterally or bilaterally.

No signs of any inflammation, mass, or allergy in the nasal cavity and the paranasal sinuses as noted in the nasal endoscopy or CT scan of the paranasal sinuses performed on the symptomatic patient.

Completely normal neurological examination and normal cranial CT; completely normal ophthalmologic evaluation.

Identification of mucosal contact areas related to one or more anatomic variations on endoscopy and CT.

The diagnosis was further confirmed by the palpation of a suspected contact point within the nasal cavity which provoked pain of a similar nature, and/or if the topical application of lidocain solution to the suspected area with the help of a cotton pledget or in the form of nasal spray (xylocaine 10%) relieved the pain in the next 10–15 min as recommended by Anselmo- Lima et al. [5].

The demographic features of the patients, the nature and duration of the complaint, the endoscopic and CT-scan findings of contact areas, and anatomic variations were recorded. A visual analogue scale (VAS) was used as the primary efficacy measure. Patients recorded their individual sensation of pain on a scale measuring 10 cm in length. The scale was marked as no pain on one end and maximum pain on the other end without any other markings in between. The mark on the scale was measured in millimeters for quantification. Headache intensity was graded based on a 100-point visual analog scale (VAS) pre- and post-operatively.

Surgery was performed under general anesthesia. Concha bullosa was treated by lateral partial resection to allow the lateralization of the medial remnant of the turbinate away from the nasal septum. A paradoxically bent middle turbinate was treated by segmental resection with turbinate scissors throughout its bulbous part leaving the lamellar or superior part of the turbinate intact. In cases with nasal septal deviation or septal spurs, nasal septoplasties or spur resections were carried out. Postoperatively, all patients were administered antibiotics for 5 days and frequent nasal douches were performed 5–6 times daily for 14 days. Patients were discharged to return for postoperative care on the tenth postoperative day. In the control visits, synechiae or crusts, if present, were removed by nasal endoscopy.

Patients

A total of 54 patients, 31 females and 23 males, were included into the study group. The patients' ages ranged from 18 to 50 years with a mean of 30.41 years.

Nature of Pain

The pain was experienced almost daily or 4–5 times a week, lasting several hours, with analgesics such as acetaminophen offering partial and transitory relief. The mean chronicity period of the headaches was 4.2 years ranging from 1 to 10 years. All of the patients reported the duration period of their headaches to be more than 1 year.

Follow-Up and Statistical Analysis Patients were followed for at least 6 months. Postoperative VAS scores were recorded at the end of 6 months. The demographic data and pre- and postoperative VAS values were examined by use of a paired t test and unpaired t test by SPSS 18 for windows.

Results

The anatomic variations causing possible mucosal contact between the middle turbinate and the nasal septum or the lateral nasal wall as diagnosed during the nasal endoscopy and/or CT scans are given in (table 1).

In 26 of 54 (48%) patients septal deviation and/or spur was recognized as the anatomic variation causing mucosal contact with the nasal septum or lateral nasal wall or with both of the structures. In the remaining 28 (52%) cases there were multiple anatomic variations causing mucosal contact. In 10 of 54 (18.5%) septal deviation and middle turbinate hypertrophy, 8 (14.8%) septal deviation and inferior turbinate hypertrophy, 8 (14.8%) concha bullosa and 2 patient (3.7%) paradoxical middle turbinate found.

Intraoperatively, 26 of the 54 (48%) patients had septoplasty, 10 (18.5%) had septoplasty and partial middle turbinectomy and 8 (14.8%) had septoplasty and partial inferior turbinectomy. The resection of the lateral half of the concha bullosa in 10 (18.5%) patients with preservation of the medial bony lamella (table 2).

All 54 patients reported a postoperative absence of headaches or a decrease in the intensity of them. 26 (48.15%) patients reported complete relief of pain following surgery and 22 (40.75%) reported occasionally having minimal to moderaste pain which they no longer considered significant. 6(11.10%) reported slight improvement as they still consumed medication. None of the patients reported an increase in the frequency or intensity of their headaches postoperatively. All of the patients with nasal obstruction (n = 10) noted relief.

Statistical analysis of preoperative pain VAS scores revealed a mean value of 87.03 postoperatively the mean value was 10.37 for patient with septal deviation and septal spur, and 89.5 and 21.0 respectively for patient with septal deviation and middle turbinate hypertrophy. The difference between pre and postoperative VAS scores was statistically significant ($p < 0.01$).

Discussion

In our study group, the most common anatomic variation narrowing the intranasal spaces was septal deviation and/or spur (48%); this was reported by Chow [13] as the most common cause of headache in a series of patients with rhinologic headaches. Similar findings were also reported by Gerbe et al. [4], who diagnosed septal spurs as a cause of headache in 18 out of 20 patients. Anselmo-Lima et al. [5] also reported 5 patients with concha bullosa, which caused middle turbinate headache syndrome and the complete resolution of headache following surgery in all of their patients.

In our study, (48.15%) of patients reported complete relief of pain following surgery and (40.75%) reported occasionally having minimal pain. Bektas et al [14] reported (52.7%) complete relief, while Tosun et al [15] reported (43%) total relief and (47%) significant improvement. Mokbel et al [16] reported (98.75%) benefit from surgery in patients tested as lidocaine positive. 83% no longer complained of headaches, while 8% had significant relief in Behin et al study [7].

Our result reveal 70% of patients treated by middle turbinate lateral resection for concha bullosa get excellent improvement, and 30% get good improvement so that all patients had improved. Mariotti LJ *et al*. revealed that, endoscopic sinus surgery in rhinogenic headache was widely successful on their patients, and 28 (84.8%) of 33 patients had reported an improvement [17].

Conclusion

Our results show that when a demonstrated contact point headache responds to local anesthetics/vasoconstrictors, the surgical removal of the contact point usually alleviate headache in the majority of patients.

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Table (1): Anatomic variations noted on nasal endoscopy and CT of the 54 patients

Anatomic variation	n	%
Septal deviation and/or spur	26	48%
Septal deviation and middle turbinate hypertrophy	10	18.5%
Septal deviation and inferior turbinate hypertrophy	8	14.8%
Concha bullosa	8	14.8%
Paradoxical middle turbinate	2	3.7%

Table (2): Surgical procedures applied to patients with RCPH

Type of surgery	n
Septoplasty	26
Septoplasty and partial middle turbinectomy	10
Septoplasty and partial inferior turbinectomy	8
Middle turbinate lateral resection	10

Table (3): Mean values ± SD (standard deviation) of VAS for headache according to the anatomical variations.

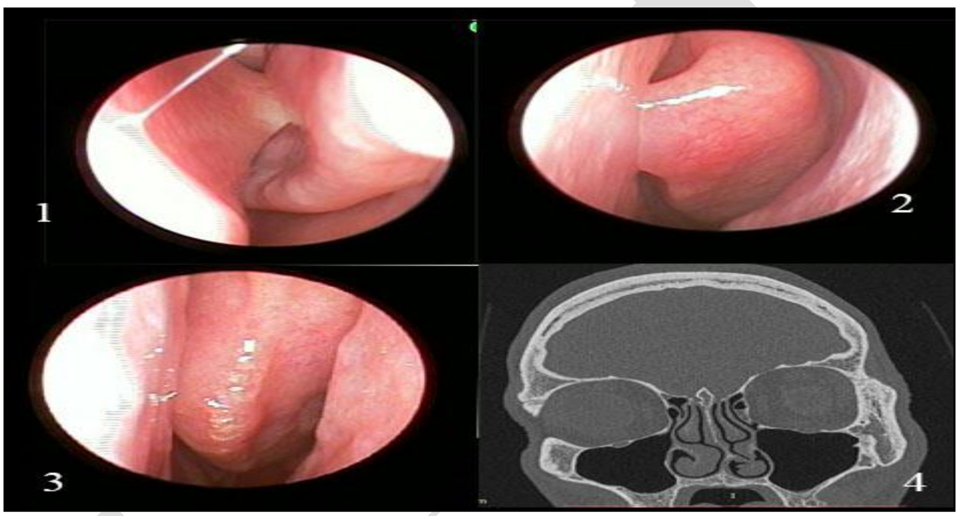
Anatomical variations	n	Preoperative VAS (mean)±SD	Postoperative VAS (mean))±SD
Septal deviation and/or spur	26 (48.15%)	87.03 ± 5.48	10.3 ± 12.64
Septal deviation and middle turbinate hypertrophy	10 (18.5%)	89.5 ± 5.50	21.0 ± 21.4
Septal deviation and inferior turbinate hypertrophy	8 (14.8%)	81.25 ± 6.40	16.87 ± 15.56
Concha bullosa	8 (14.8%)	90.62 ± 4.95	7.5 ± 8.01
Paradoxical middle turbinate	2 (3.7%)	85 ± 7.07	5 ± 7.07
Total	54 (100%)	87.09 ± 6.10	12.68 ± 14.81

Table (4): Mean values ± SD of VAS of the patients according to headache improvement. (Excellent improvement: post-operative VAS less than 10, Moderately good improvement: post-operative VAS 10 – 20 Minimal improvement: post-operative VAS 30 and more.)

Degree of headache improvement	n	Preoperative VAS (mean)±SD	Postoperative VAS (mean)±SD
Excellent improvement	26 (48%)	88.38 ± 6.59	2.11 ± 2.51
Moderately good improvement	22 (40.75%)	85.68 ± 4.95	15.90 ± 4.78
Minimal improvement	6 (11.10%)	86.66 ± 7.52	46.66 ± 13.66

Table (5): degree of headache improvement according to type of surgery.

Type of surgery	**Excellent improvement**			**Moderately good improvement**			**Minimal improvement**		
	n	%	Postoperative VAS mean± SD	n	%	Postoperative VAS mean± SD	n	%	Postoperative VAS mean± SD
Septoplasty	13	50%	1.53 ±2.40	11	42.30 %	14.54± 5.22	2	7.69%	45.0 ± 7.07
Septoplasty and partial middle turbinectomy	3	30%	1.66 ±2.88	4	40%	16.25±4.78	3	30%	46.66± 20.01
Septoplasty and partial inferior turbinectomy	3	37.5%	3.33±2.88	4	50%	18.75± 2.5	1	12.5%	50 ±0.0
Middle turbinate lateral resection	7	70%	2.85±2.67	3	30%	16.66±5.77	0	0	0



Figure(1): Antomic Variations (1=left septal spur, 2= paradoxical left middle turbinate, 3= left concha bullosa, and 4= coronal CT-scan showing septal spur impinging left inferior turbinate)