Keywords
mucosal contact point, headache, nasal septal deviation, inferior turbinate hypertrophy, surgery

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Management of Mucosal Contact Point Headache Using an Endoscopic Sinonasal Surgical Approach

Abstract

Introduction: A mucosal contact point (MCP) is a condition in which mucosal surfaces within the nasal cavity come into contact, often resulting from nasal septal deviation or inferior turbinate hypertrophy. Management of headaches caused by MCPs may involve pharmacological therapy-such as intranasal corticosteroids and decongestants-as well as surgical interventions, including nasal-paranasal, septal, turbinate, or ethmoid-sphenoid surgery.

Objective: To provide information for clinicians in establishing an MCP diagnosis and to serve as a benchmark for the success of endoscopic sinonasal surgery in MCP cases.

Case report: Two young adult women presented with headaches caused by mucosal contact points (MCP). One case involved mucosal contact between the bilateral concha bullosa (middle turbinates) and the nasal mucosa, managed with bilateral functional endoscopic sinus surgery; the other case involved a Mladina type 5 septal deviation, managed with endoscopic septoplasty.

Methods: A literature search was conducted in PubMed using the keywords ("mucosal contact point" OR "rhinogenic headache") AND ("management" OR "surgery").

Results: Six case reports relevant to the topic and available in full text were identified from a total of 18 search results.

Conclusion: Two cases of mucosal contact point (MCP) with differing anatomical variations and endoscopic sinonasal surgical management were reported. Both cases showed a significant reduction in Visual Analog Scale scores following surgical intervention.

INTRODUCTION

A mucosal contact point (MCP) is defined as contact between mucosal surfaces within the nasal cavity, which may result from a nasal septal deviation touching the inferior turbinate or another part of the lateral nasal wall. An MCP may also be present when nasal septal deviation occurs concurrently with inferior turbinate hypertrophy.[1] Such contact between mucosal surfaces can cause headaches.[2] According to the International Classification of Headache Disorders (ICHD-2), headaches caused by an MCP are characterized by intermittent pain localized to the periorbital, medial canthal, or temporozygomatic regions.[3]

The pathophysiology of MCP-associated headache remains unclear; however, some authors suggest that the stimulation of Substance P (SP) and unmyelinated C-fibers plays a significant role. The release of SP triggers local reflexes—such as vasodilation, plasma extravasation, hypersecretion, and perivascular inflammation—that can result in headaches resembling migraine with aura. Studies have demonstrated elevated SP levels in patients with MCP who also present with nasal polyps or mucosal hyperplasia. Patients with allergic conditions may experience more severe headaches, potentially due to an increased area of mucosal contact.[2]

Management of headache secondary to MCP can involve medical and surgical approaches. Medical management may utilize intranasal corticosteroids and decongestants, whereas surgical options include nasal-paranasal, septal, turbinate, and/or ethmoid-sphenoid surgery.[4] This case report aims to present two cases of MCP involving anatomical variations and different surgical management strategies.

CASE REPORT

Case 1

A 31-year-old woman presented to the outpatient clinic of Dr. Soetomo Regional General Hospital with a chief complaint of facial pain—specifically in the cheeks and the forehead above the right and left eyebrows—persisting for three years (Visual Analogue Scale/VAS: 7). The patient also reported intermittent bilateral nasal congestion (VAS: 5). Anterior rhinoscopy revealed a leftward septal deviation. Nasoendoscopy (NE) showed enlarged right and left middle turbinates and narrowed right and left middle meatuses (Figure 1).

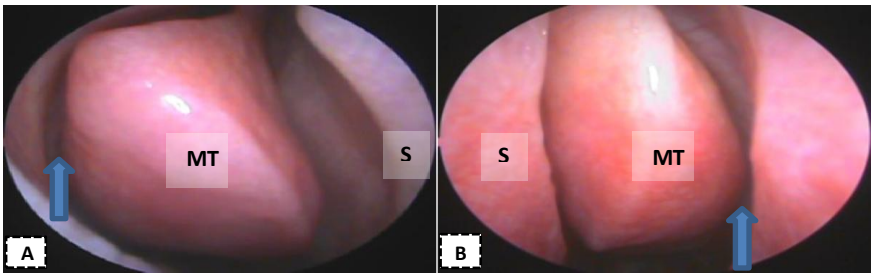

Figure 1. (A) Enlarged right middle turbinate and narrowed right middle meatus (blue arrow); (B) Enlarged left middle turbinate and narrowed left middle meatus. Labels indicate: (MT) middle turbinate, (S) septum.

A head CT scan focused on the paranasal sinuses revealed bilateral concha bullosa (middle turbinates) and a leftward nasal septal deviation (Mladina type 2) (Figure 2). The patient was diagnosed with barosinusitis, with MCP as a differential diagnosis.

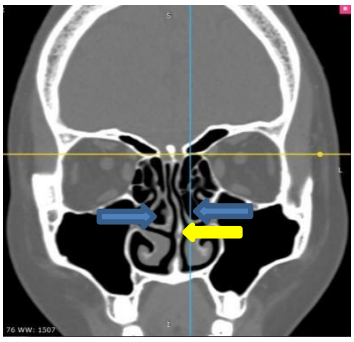

Figure 2. Coronal section showing right and left concha bullosa (blue arrows) and a leftward nasal septal deviation (Mladina type 2; yellow arrow).

Bilateral functional endoscopic sinus surgery (FESS) was performed under general anesthesia using a Karl Storz Spies Series camera system and a 0-degree, 4 mm, 18 cm telescope. The patient was placed in a supine position with a 20-degree reverse Trendelenburg tilt. The facial area was disinfected with 70% alcohol, followed by the placement of sterile drapes. Both nasal cavities were widened using Merocel® strips moistened with 0.05% oxymetazoline and 1% lidocaine. Nasal hair was trimmed while awaiting the decongestant effect. Subsequently, an uncinectomy was performed using a backbiter (Figure 3), followed by a middle meatal antrostomy.

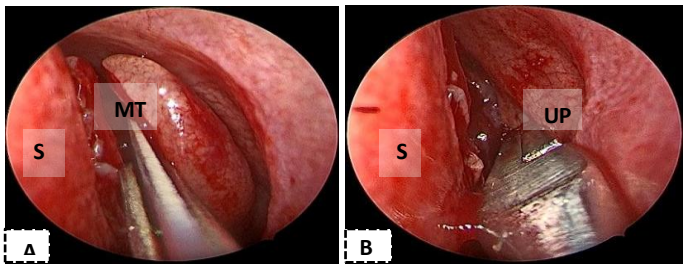

Figure 3. Right nasal cavity. (A) Resection of concha bullosa (middle turbinate). (B) Uncinectomy. The uncinate process (UP) is visible in the image.

The procedure continued with an evaluation of the frontal recess, which was found to be patent. Subsequently, the same procedure was performed on the left side (Figure 4). Bleeding was assessed, and approximately ten milliliters of blood loss was noted. The bleeding was managed by placing an absorbable hemostat (Surgicel®).

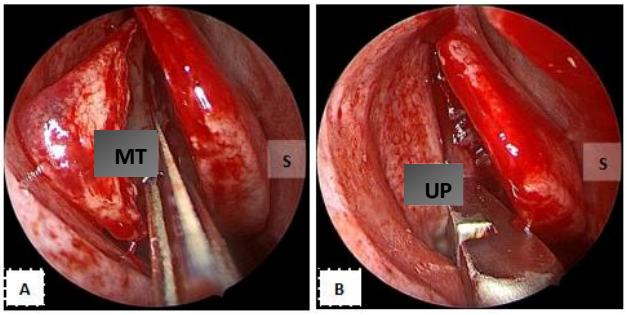

Figure 4. Left nasal cavity. (A) Resection of concha bullosa of the middle turbinate. (B) Uncinectomy.

Postoperatively, the patient received intravenous ketorolac (30 mg every 8 hours) and metoclopramide (10 mg every 12 hours). The patient was instructed to maintain bed rest in a supine position with the head elevated by 20 degrees. Blowing the nose, bending forward, straining, and lifting weights exceeding 7.5 kg were prohibited.

The patient was instructed to keep their mouth open when coughing or sneezing. By one day post-operation, the complaint of pain above the eyebrows had diminished (VAS: 3), and nasal congestion was no longer present. The patient was educated on performing bilateral nasal irrigation with 0.9% NaCl twice daily. The patient was discharged and scheduled for a follow-up visit at the outpatient clinic for postoperative evaluation.

The patient returned for a follow-up at the outpatient clinic nine days post-operation; the complaint of pain above the eyebrows had resolved. Anterior rhinoscopy revealed patent right and left nasal cavities with no secretions. Nasal endoscopy evaluation showed patent nasal cavities, middle meatuses, and antra on both the right and left sides (Figure 5). The patient was diagnosed with bilateral maxillary sinus patency following FESS. Nasal irrigation therapy was prescribed.

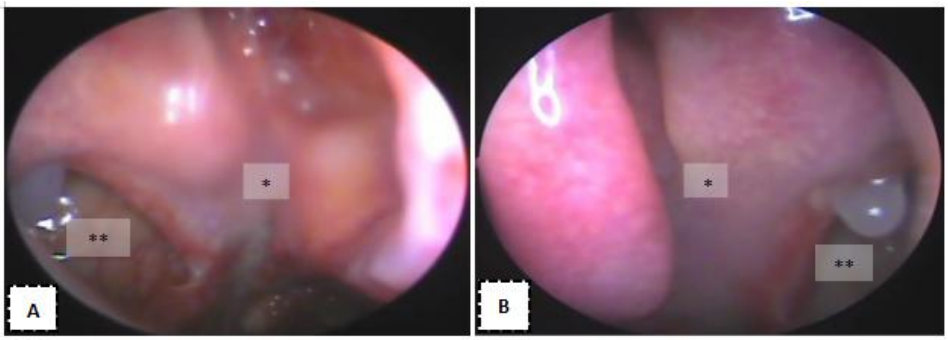

Figure 5. Right (A) and left (B) middle meatus (*) and antrum (**) are spacious.

The patient returned for a follow-up visit at the outpatient clinic one month post-surgery; the patient reported no complaints. Anterior rhinoscopy revealed patent right and left nasal cavities with no secretions. Nasal endoscopy showed wound healing, with patent middle meatuses and antra bilaterally. The patient was instructed to continue nasal irrigation for one week.

Case 2

A 27-year-old woman presented to the outpatient clinic at Dr. Soetomo Regional General Hospital with a chief complaint of persistent right cheek pain following surgery two weeks prior (VAS: 7). Preoperatively, the patient had complained of right-sided forehead pain that worsened upon prolonged bending forward (VAS: 8), pain at the vertex of the head (VAS: 8), and constant right cheek pain (VAS: 5). She was diagnosed with right-sided barosinusitis and a Mladina type 5 rightward septal deviation, and had undergone bilateral FESS. Anterior rhinoscopy revealed a rightward septal deviation. Nasal endoscopy showed mucosal contact points (MCP) between the septum and the right middle and inferior turbinates (Figure 6). The right cheek pain subsided upon the application of Xylocaine spray.

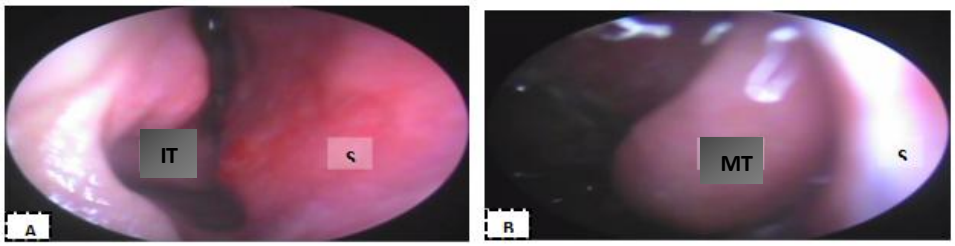

Figure 6. Right nasal cavity. (A) Appearance of contact between the inferior turbinate (IT) and the septum. (B) Appearance of contact between the middle turbinate

A head CT scan focused on the paranasal sinuses revealed findings of minimal bilateral maxillary sinusitis and a deviated nasal septum (Figure 7). The patient was diagnosed with a Mladina type 5 deviated septum and bilateral middle turbinate concha bullosa (post-FESS).

Figure 7. Leftward nasal septal deviation, Mladina type 5 (yellow arrow).

Endoscopic septoplasty was performed under general anesthesia using a Karl Storz Spies Series camera system and a 0-degree, 4 mm, 18 cm telescope. The patient was placed in a supine position with 20° reverse Trendelenburg tilt. The facial area was disinfected with 70% alcohol, followed by the placement of sterile drapes. Both nasal cavities were widened using Merocel® strips moistened with 0.05% oxymetazoline and 1% lidocaine. Nasal hair was trimmed while waiting for the decongestant effect to take hold. The surgery was performed on the right side, beginning with a Killian incision in the right nasal cavity. Subsequently, mucoperichondrial dissection was performed using a Guillen suction rasp, followed by mucoperiosteal dissection (Figure 8).

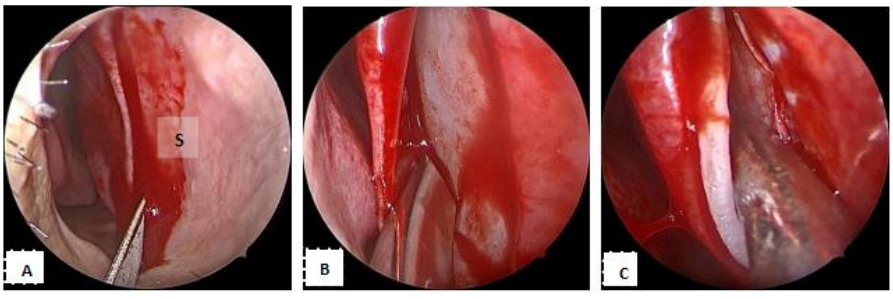

Figure 8. Right nasal cavity. (A) Killian incision. (B) Mucoperichondrial dissection. (C) Mucoperiosteal dissection.

The same dissection was performed on the contralateral side. Subsequently, resection of the cartilage and bone was carried out using scissors (Figure 9.A). Evaluation of the right and left nasal cavities revealed adequate space. Next, quilting

sutures were placed (Figure 9.B). Assessment of bleeding showed a blood loss of approximately twenty milliliters; the bleeding was managed by placing an absorbable hemostat (Surgicel®).

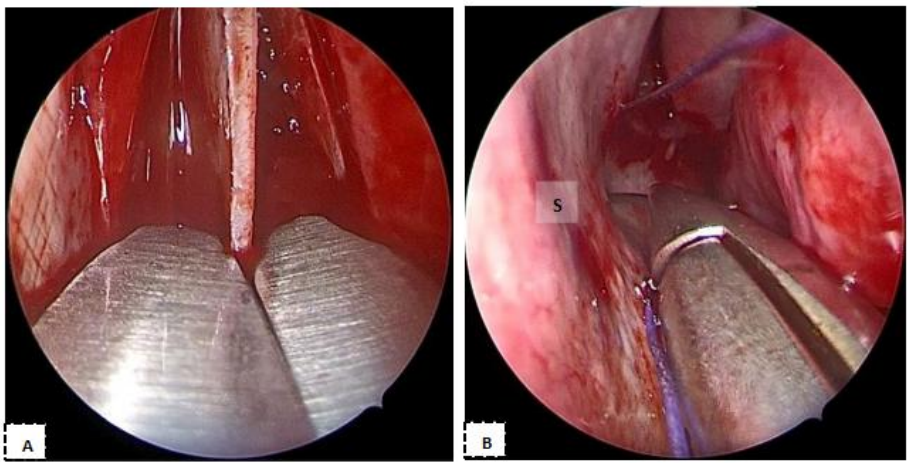

Figure 9. (A) Cartilage resection (B) Quilting sutures.

Postoperatively, the patient received oral cefadroxil (500 mg every 12 hours) and intravenous metamizole (1 gram every 8 hours). The patient was instructed to maintain bed rest in a supine position with the head elevated by 20 degrees. The patient was prohibited from blowing their nose, bending forward, straining, or lifting weights exceeding 7.5 kg. They were advised to keep their mouth open when coughing or sneezing. Pain in the right cheek had resolved by one day post-surgery. The patient was instructed to perform nasal irrigation on both the right and left sides using 0.9% NaCl twice daily. The patient was discharged and scheduled for a follow-up visit at the outpatient clinic for postoperative evaluation. The patient was followed up at URJ fifteen days post-surgery, and the pain in her right cheek was gone. Anterior rhinoscopy revealed a wide right and left nasal cavity with no discharge. Nasal lavage showed a wide right and left nasal cavity, a resolved MCP, and sutures in the septum (Figure 10). The patient was re-diagnosed with Mladina type 3 deviated septum and post-endoscopic septoplasty MCP. Nasal lavage was discontinued.

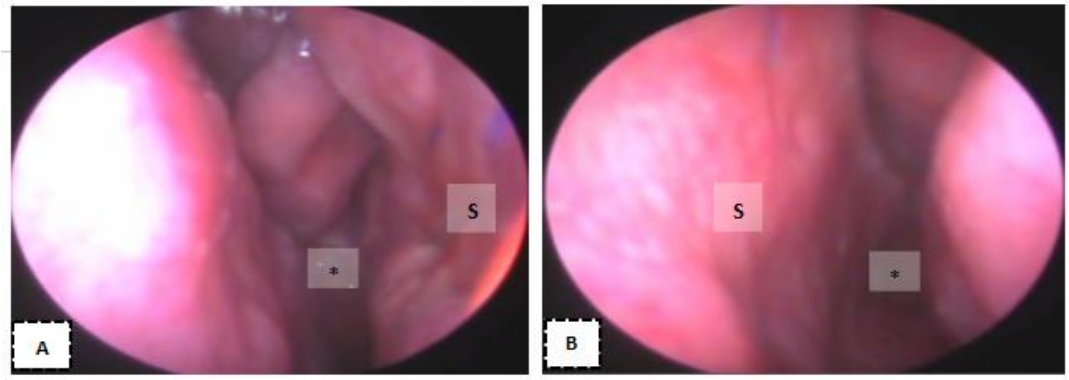

Figure 10. The right (A) and left (B) nasal cavities (*) are spacious.

CLINICAL QUESTION

What is the appropriate management for headaches caused by a mucosal contact point?

METHODS

A literature search conducted on PubMed using the keywords ("mucosal contact point" OR "rhinogenic headache") AND ("management" OR "surgery") covering the last five years yielded six relevant case reports available in full text, out of a total of 18 search results.

RESULTS

The management of MCP headache encompasses everything from establishing the diagnosis to implementing appropriate treatment. Diagnosis is determined subjectively based on patient complaints and objectively based on the results of physical and ancillary examinations. Treatment for MCP involves both medical and surgical approaches. Surgery may be performed using conventional or endoscopic techniques. Surgical outcomes have been favorable (Table 1).

Table 1. Analisis Population/Patient, Intervention, Comparison dan Outcome (PICO)

	Population/Patient	Intervention	Comparison	Outcome
Altin F, Haci C, Alimoglu Y dan Yilmaz S. 2019 .	Patients with an isolated mucosal contact point without respiratory issues	Topical nasal corticosteroids	Surgery	Surgery yields more effective results in patients with rhinogenic headache
Timothy RN and Kumar KRJ. 2021.	Patients with mucosal contact points	Endoscopic sinonasal surgery	-	Severe headache improved
Abdelaal AS, Amin M and Elhabashy H. 2022.	Patients with rhinogenic headache caused by a mucosal contact point	Endoscopic sinonasal surgery	-	Postoperative reduction in Visual Analog Scale score
Li Y, Liu Z, Xu B, Jia H, Wang Y, Zhu Y, et al.. 2022.	Patient with a mucosal contact point between the superior turbinate and the nasal septum.	Surgery	-	Surgical success rate of 95%
Mantia IL, Grillo C and Andaloro C. 2018.	Patients with headache due to mucosal contact points.	Surgery	Pharmacological Treatment	Severity, duration, and frequency of headache; the group is significantly affected surgery
Vukoje N, Chicago MK and Garito J. 2020.	Patients with headache due to mucosal contact point	Surgery	Pharmacological Treatment	Surgery is a treatment that achieves a cure in 69.3% of cases.

DISCUSSIONS

Headache caused by MCP is a rare condition and represents a new classification according to the International Classification of Headache Disorders.[5] The two cases described above involved young adult females (Table 2). A study by Altin et al. (2019) involving 99 patients complaining of chronic headache or facial pain associated with MCP between the inferior turbinate and the nasal septum found a higher proportion of females (58.6%) than males (41.4%), with a mean age of 32.68 ± 7 years (range: 17–54 years).[2] A similar study by Timothy and Kumar (2021) involving 150 patients with MCP reported 48% males and 52% females, with an age range of 18–50 years; the majority fell into the 21–30 age group (42.7%), with a mean age of 26.7 years.[3] The gender and age range in the cases described above are consistent with the literature, which identifies young adult females as the affected demographic.

Table 2. Comparison of cases based on gender, age, clinical symptoms, and VAS.

Sex		Age	Clinical symptoms	VAS
Case 1	P	31	Pain in the right and left cheeks	7
			Pain above the right and left eyebrows	7
			Right and left nasal congestion	5
Case 2	P	27	Pain in the right cheeks	7

Cheek pain, pain above the eyebrow, and nasal congestion were clinical symptoms present in both cases described above (Table 2). A study by Abdelaal et al. (2022) reported headache complaints primarily in the frontal region, specifically at the nasal root, eyes, and zygoma.[6] Li et al. (2022) reported that among 80 patients with middle

turbinate concha bullosa (MTCB)—referred to here as MCP—located between the superior turbinate and the nasal septum, 46 experienced frontal headaches, 28 experienced periorbital or medial canthus pain, 9 experienced temporozygomatic pain, and 3 experienced pain in both the frontal and temporozygomatic regions.[7] The pain locations in the two cases above align with the literature—specifically cheek (zygomatic) pain—with Case 1 also presenting with pain above the eyebrow (frontal/periorbital).

The pre-intervention pain intensity (based on the Visual Analog Scale, or VAS) in both cases was 7. A study by Mantia et al. (2018) reported pre-intervention pain intensity ranging from 5.3 ± 1.9.4 Eyigor et al. (2020) reported a pre-operative headache VAS score of 5.95 ± 2.03 (range: 2–9).[8] Abdelaal et al. (2022) reported a mean pre-intervention headache severity score of 7.6 on the VAS.[6] There is consistency between the existing literature and the cases described above regarding pre-intervention VAS pain scores.

The xylocaine test was not performed for Case 1 but was conducted for Case 2. Xylocaine spray was applied directly to the MCP site during the nasal endoscopy (NE) for Case 2, yielding a positive result (Table 3). In the study by Abdelaal et al. (2022), the xylocaine test was performed by placing a cotton pledget soaked in 5% xylocaine at the MCP site for 15 minutes; the test result was considered positive if the patient experienced a pain reduction of more than 50%. This test was conducted following the nasal endoscopy (NE) and CT scan of the nose and paranasal sinuses to confirm whether the headache was caused by the MCP.6 Vukoje et al. (2020) employed 10% lidocaine in the same manner for 10 minutes, using a positive result as an indication for surgical intervention. In that study, the lidocaine test also served as a non-invasive intervention option.[5]

Table 3. Comparison of cases based on xylocaine test, CT scan, and intervention.

	xylocaine test	CT-scan sinus paranasal	Intervention
Case 1	Do not	Bilateral bullous middle conchae Mladina type 2 septal deviation	FESS dextra dan sinistra
Case 2	Positive	Mladina type 5 septal deviation	Endoscopic septoplasty

Anatomical variations observed on paranasal sinus-focused head CT scans consisted of bilateral concha bullosa and a Mladina type 2 septal deviation in Case 1, whereas Case 2 presented with a Mladina type 5 septal deviation (Table 3). A study by Abdelaal et al. (2022) reported the following anatomical variations: septal deviation with a septal spur in 3 patients (10%); septal deviation with a septal spur and inferior turbinate hypertrophy in 13 patients (43.3%); contact between a hypertrophied superior turbinate and a deviated septum in 4 patients; contact between a hypertrophied middle turbinate and a deviated septum in 1 patient (3.3%); middle turbinate hypertrophy in 8 patients; and hypertrophy of both the middle and inferior turbinates in 1 patient (3.3%).[6]

Nasal septal deviation and septal spurs are commonly encountered anatomical variations associated with MCP, followed by concha bullosa and ethmoid bullae.[9] Mantia et al. (2018) reported that among 94 MCP patients meeting the inclusion criteria, concha bullosa was found in 32 patients, nasal septal deviation in 35, and septal spurs in 27.[4] The anatomical variations observed in the two cases above are consistent with the literature. Indications for surgical intervention in MCP include: 1) Unilateral headache treated for at least one year without improvement; 2) Presence of MCP verified endoscopically or via CT scan or Nuclear Magnetic Resonance (NMR); and 3) A positive lidocaine test.[5] The patient in Case 1 had experienced pain for three years, whereas in Case 2, MCP was suggested by nasal endoscopy (NE) findings and a positive xylocaine test. Both cases met the criteria for surgical intervention as outlined in the literature.

Total turbinectomy was the surgical intervention performed for concha bullosa of the middle turbinate prior to the endoscopic era.[10] Endoscopic sinonasal surgery is the ideal surgical intervention for managing headaches caused by middle concha pneumatization (MCP) because it allows for superior visualization of the MCP. Good visualization is crucial for ensuring that MCP resection is controlled and precise, while minimizing injury to the adjacent mucosa.[9,11] Endoscopic sinonasal surgery is generally performed under general anesthesia. If mucosal contact is present on both sides of the nose, surgery on the contralateral side should be performed immediately after completing the first side.[9] In Case 1, bilateral functional endoscopic sinus surgery was performed, consistent with the literature.

Septoplasty or spurectomy is a surgical procedure that helps correct nasal septal deviation and reduce contact between the turbinate and the septum (Table 4).[9,11] Endoscopic septoplasty offers more durable therapeutic success compared to medical interventions, which provide only temporary relief.[2] A study by Abdelaal et al. (2022) reported the use of endoscopic septoplasty for patients with septal deviation and septal spurs; endoscopic septoplasty combined with turbinoplasty for patients with septal deviation and inferior or middle turbinate hypertrophy; and endoscopic turbinoplasty for patients with inferior and middle turbinate hypertrophy.[6] The surgical intervention chosen in Case 2 aligns with the literature.

Table 4. Anatomical variations and recommended surgical procedures.[11]

Anatomical variations based on NE and CT scans.	Endoscopic sinus surgery procedure performed on patients with RCPH.
Deviated septum or septal spur	Septoplasty or spurectomy
Concha bullosa	Conchoplasty (resection of the lateral wall of the superior or middle turbinate)
Large ethmoid bulla	Anterior ethmoidectomy
Inferior turbinate hypertrophy	Turbinoplasty or conservative partial turbinectomy

RCPH = Rhinogenic Contact Point Headache

Post-surgical Visual Analogue Scale (VAS) scores in both cases above showed a significant decrease, consistent with the literature. In Case 1, the pain score dropped to VAS 3 one day post-operation and to VAS 0 between nine days and one month post-operation; meanwhile, in Case 2, the VAS score fell to 0 as early as one day post-operation and remained at that level through day fifteen (Table 5). A study by Altin et al. (2019) reported that the reduction in VAS scores among patients with MCP who underwent septoplasty was more sustained compared to those treated solely with topical steroids.[2] Abdelaal et al. (2022) reported a reduction in VAS scores to 1.8 following endoscopic surgical intervention.[6]

Table 5. Comparison of cases based on post-intervention VAS

	Clinical symptoms	**1 day post-operation**	**>7 days post-operation**
Case 1	Pain in the right and left cheeks	3	0
	Pain above the right and left eyebrows;	3	0
	nasal congestion on the right and left sides	0	0
Case 2	Pain in the right cheek	0	0

The diagnostic criteria for MCP according to the Headache Classification Committee (International Headache Society) are: intermittent pain localized to the periorbital, medial canthus, or temporozygomatic regions; nasoendoscopy and/or CT scan demonstrating MCP in the absence of acute sinusitis; pain that varies with gravity-dependent mucosal congestion when the patient changes position between upright and recumbent, or pain that resolves within 5 minutes of topical local anesthetic application to the middle turbinate; and pain that resolves and does not recur within 7 days following surgical intervention.[11]

CONCLUSION

Two cases of mucosal contact point (MCP) involving different anatomical variations and endoscopic sinonasal surgical management have been reported. One case involved bilateral concha bullosa treated with bilateral functional endoscopic sinus surgery, while the other involved a Mladina type 5 septal deviation treated with endoscopic septoplasty. Both cases demonstrated a significant reduction in Visual Analog Scale scores following surgical intervention. These case reports serve as a resource for clinicians in diagnosing MCP and provide evidence regarding the success of endoscopic sinonasal surgery for this condition.

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