

# Cauterization of inferior nasal turbinate for idiopathic headache

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## ABSTRACT

**Objectives:** Idiopathic headache is a stressful complaint, whose treatment is not well established. Our study is an attempt to examine the relationship between idiopathic headache and inferior turbinate cauterization as a surgical treatment, and to explain the central physiological effect of cauterization.

**Methods:** Thirty-four patients, 15 females and 19 males complaining of idiopathic headache were treated by inferior turbinate cauterization. Cauterization of the inferior-medial aspect of the turbinate was carried out once under local anesthesia for few seconds. This study was performed between

November 1993 and December 1996, a joint project of the Zarka Government Hospital, Zarka and Faculty of Medicine, University of Jordan, Amman, Jordan.

**Results:** More than 82% of the patients showed significant improvement in the sense of decreased headache.

**Conclusions:** Cautery of the nasal turbinate could be a novel method for treatment of idiopathic headache.

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**I**diopathic or primary headache is currently classified as abnormal brain function with completely normal brain structure. Headache is a common complaint and a very frustrating symptom for both the patient and the treating physician. Stammberger and Wolf<sup>1</sup> classified patients with headaches into 3 groups: 1. Those with headache of sinonasal abnormalities. 2. Those with headache not related to sinonasal origin and 3. Those with headache in which the cause is not clear (idiopathic headache). The etiologic factors of headaches are quite varied. The relationship between headache and sinonasal anatomical variations or abnormalities in the absence of inflammatory disease has been studied by many investigators. These variations have been accepted as a source of referred headaches, including nasal turbinates,<sup>2-8</sup> ethmoidal bulla,<sup>1,9</sup> septal deviations or spurs,<sup>10-14</sup> mucosal contact points,<sup>1,15-19</sup> nasal stenosis or obstruction due to different causes,<sup>8,12-14,20</sup> and middle meatus and frontal recess disorders or variations.<sup>1</sup>

Other investigators have suggested that headaches and nasal mucosal contact points have an uncertain and coincidental relationship<sup>16,21</sup> and central pathological mechanisms play a role in the etiology of headaches.<sup>14,16</sup> Despite the results of former studies of surgical correction of sinonasal abnormalities, we are unaware of any reports in the literature on cauterization of nasal turbinates as a treatment for headache. Our study is an attempt to explain the relationship between idiopathic headache and inferior turbinate cauterization as a surgical treatment modality in the absence of sinonasal abnormalities and to explain the central physiological effect of cauterization.

**Methods. Subjects.** A prospective clinical trial of 34 patients, 15 females and 19 males complaining of idiopathic headache assigned for treatment. The 34 patients were chosen out of 76 patients referred to the

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ear, nose and throat (ENT) clinic from the Neurology Department. Forty-two patients were excluded due to sinonasal disorders. Their headache was continuous and mild to severe in intensity of all types: migraine, tension-type and cluster headache. The diagnosis of idiopathic headache was made after other known causes of headache were excluded. Clinical examination and investigations included dental, ophthalmic, neurologic, medical and ENT, including endoscopic and coronal computerized tomography scan. Patients were sent for cauterization after failure of medical treatment and absence of sinonasal disorders. The treatment was explained to all patients and written consent was signed or cosigned. The patients were followed up weekly for 2 months and monthly for 8 months. Improvement was noted after the 3rd day of cauterization and up to 10 days. This improvement was taken as a decrease in the severity or number of attacks or complete absence of headache (cure). This study was performed between November 1993 and December 1996, a joint project of the Zarka Government Hospital, Zarka and Faculty of Medicine, University of Jordan, Amman, Jordan.

**Cautery technique.** All patients underwent cauterization of the inferior turbinate on the same side as headache or the side of larger sized turbinate for diffuse headache using unipolar Downs electrical cauterizer (England). The nose was sprayed with xylocaine 10% for few minutes, and a silastic sheet was placed between the septum and the inferior turbinate to avoid any accidental cautery of the septum, and to prevent any possible adhesions between the 2 structures. Cauterization was carried out by touching the inferior-medial aspect of the turbinate about 5 mm long for 2-3 seconds duration. Local antiseptic cream was applied. All patients underwent inspection after 3 three days and slough tissue was removed.

**Results.** Thirty-four patients (15 females and 19 males) were treated with a mean age of  $25.59 \pm 9.25$  (mean  $\pm$  SD; range 10-53 years) and headache duration of 2-144 months (**Table 1**). The overall improvement rate was 82.4%. In females, there were 14 improvements (93.3%) and one failure (6.7%). In males, there were 14

improvements (73.7%) and 5 failures (26.3%). This difference in improvement rate between females and males is not statistically significant ( $p > 0.1$ ).

**Discussion.** Idiopathic headache is diagnosed after excluding most other known causes of headache. It is continuous, unilateral or bilateral, affecting the vertex, frontal or occipital regions. It can be a severe distressing complaint. Most patients in our study had suffered from headache for a long time. Many specialists had seen them, and their complaints did not subside with medical treatment.

Idiopathic headache is believed to be due to dysfunction of the opioid system in the brain.<sup>22</sup> The midbrain periaqueductal gray matter and paraventricular regions are important endogenous pain suppression areas. Nerve terminals containing opioid peptides (endorphin, enkephalin and dynorphin) and other neuropeptides have been demonstrated in these areas. The local administration of opioid or electrical stimulation at these regions blocks nociceptive neurotransmission.<sup>23</sup> Branches of the trigeminal nerve pain fibers supply the turbinate of the nasal cavity. These trigeminal fibers enter the brain and synapse at the sensory nuclei of the trigeminal nerve in the pons. The fibers then cross the midline and join the fibers of the anterolateral spinothalamic tract. Many of these fibers terminate at the brainstem reticular formation, especially the important paraventricular and periaqueductal gray matter. From these 2 areas, the descending endogenous opiates (endorphin, enkephalin and dynorphin) releasing pathway is stimulated. These substances suppress pain by inhibiting the release of substance p that would act to prolong the sensation of pain.<sup>23,24</sup> The endogenous opioids are secreted in response to stimulation of pain fibers<sup>25</sup> or stress.<sup>26,27</sup> We suggest that cauterizing the nasal turbinates and stimulating the trigeminal pain pathway would stimulate the endogenous pain suppression system (central mechanism). This would lead to an increase in the release of endogenous opioids that would improve or suppress the feeling of headache. Some investigators postulate that central mechanisms play a role in the improvement of headache.<sup>14,16</sup> Others have proven that restoring the nasal airway passages by inferior turbinectomy,<sup>8</sup> rhinoplastic surgery,<sup>12</sup> reconstructing nasal stenosis,<sup>13</sup> and rhino-cranial base neurovascular decompression<sup>20</sup> cured or improved headache. Our interpretation of this improvement is 2 fold. Firstly, stimulation of trigeminal nerve fibers by surgery stimulates the endogenous pain suppression system (central mechanism) and, secondary, surgery restores the nasal airway passages and consequently improves cellular oxygenation of the brain. Our treatment improved headache in 82.4% of patients. We hypothesize that turbinate cauterization sensitized the endogenous pain suppression system making it more

**Table 1** - Mean age, sex, results of treatment and duration of headache.

Sex	n	Age (years) mean $\pm$ SD	Duration of headache (mean)	Results	
				Improved n (%)	Failed n (%)
Male	19	26 $\pm$ 10.28	2-144 (37.61)	14 (73.7)	5 (26.3)
Female	15	25.07 $\pm$ 8.11	2-84 (16.79)	14 (93.3)	1 (6.7)
<b>Total</b>	<b>34</b>	<b>25.59 <math>\pm</math> 9.25</b>	<b>2-144 (28.5)</b>	<b>28 (82.4)</b>	<b>6 (17.6)</b>

responsive to minimal stimulation, in addition, improvement of airway passages may have played a role in our study.

In conclusion, we believe that cauterization of nasal turbinates achieved 2 things: stimulation of trigeminal nerve fibers activating the endogenous pain suppression system (central mechanism) and improvement in the airway passages, consequently improving the cellular oxygenation of the brain. We also believe that cauterization of nasal turbinate could be a novel treatment for relieving idiopathic headache. To prove our explanation further, measurement of endogenous opiate levels before and after treatments are required.

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