



Research article

Effectiveness of endonasal cranial balloon release technique in relieving symptoms of migraine and improving the quality of work in a sedentary worker - A single case study

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Migraine is a neurological condition affecting women more than man is often a cause to decrease the quality of work and productivity in workers. This study introduces a novel technique Endonasal Cranial balloon release, which has potential benefits in the treatment of migraine and its symptoms. This is a single case report of 37-year-old female who presented with a 2-year history of migraine with no other comorbidities and having difficulty in participating actively in the work-place. After explaining the entire procedure and written consent, the patient was treated with Endonasal Cranial balloon release for four sessions, each session a day continuously. The pain was assessed by the Visual Analog Scale (VAS). The impact of migraine was assessed by Headache Impact Test (HIT). The impact of migraine on work productivity was assessed by the Work Productivity and Activity Impairment (WPAI) questionnaire. All the outcome measures were measured pre-treatment, Post-treatment after completion of all four sessions, and after one-month follow-up. The patient pain has reduced tremendously, with improved work productivity and participation. This study concludes that the Endonasal Cranial Balloon Release technique would reduce the pain and discomfort due to migraines without remissions. It rehabilitates the worker with improved productivity. We also suggest several randomized clinical trials should be conducted to identify the potential benefits of this therapy.

Keywords: Migraine, Endonasal Cranial Balloon Release, Headache.

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INTRODUCTION

Migraine is a neurological condition that can cause multiple symptoms. Migraine affects over 20% of people at some time in their life ⁽¹⁾. Various studies suggest that approximately 1% of the world's population may have chronic migraines ⁽²⁾. It is observed that women are more affected than men ⁽³⁾. The International Classification of Headache Disorders (ICHD) uses the term chronic migraine to describe patients with frequent headaches, believed to be biologically migrainous ⁽⁴⁾. The term 'migraine' originally comes from the Greek word Hemicrania, which means 'half of the head', representing one of the most striking features of the condition as in many cases pain only affects one-half of the head. Equally commonly, pain may also be felt bilaterally, at the front or back of the head, more rarely in the face, and rarer still in the body (migrainouscorpalgia). The pain is generally throbbing in nature. Migraine pain is typically accompanied by other features such as nausea, dizziness, extreme sensitivity to lights, noises, and smells, lack of appetite, disturbances of bowel function and so on. Some persons have a warning symptom known as an aura that occurs before or with the headache. An aura can include

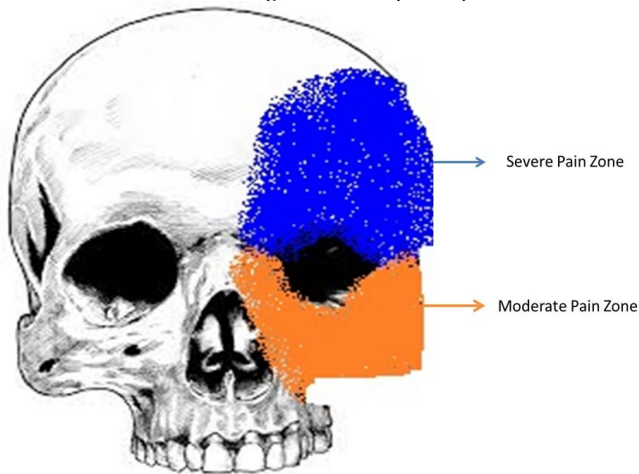
visual disturbances (flashes of light or blind spots), or other disturbances, such as tingling on one side of the face or in an arm or leg and difficulty in speaking. Many studies confirmed that migraine harms work and productivity ⁽⁵⁾. The results from previous studies reveal that the headache, severity and frequency can impact the quality of life. Mostly, the migraine headaches are treated with drugs which have adverse effects on long-term use. It is also evident that there are remissions once the drug is stopped. This study thus highlights the evidence based novel approach in treating migraine. This is a single case report to analyze the effectiveness of Endonasal cranial balloon release in relieving symptoms of migraine and improving the quality of work in a sedentary woman.

DESCRIPTION OF THE CASE**Patient history**

A 37-year-old female 'X' who is in teaching profession, reported to physiotherapy department of the University in Saifai, Uttar Pradesh, India with severe headache at frontal and temporal area, occasionally with a sense of foul smell since 2 years (Figure 1). Often the pain radiated to neck. The patient had no past history of

trauma around head, neck & face. The patient was diagnosed with Migraine by a neurologist after clinical examination and on medical management. The patient had no complete relaxation, and had frequent bouts of migraine attack. The patient reported no other comorbidity.

Figure 1: site of pain of patient



Clinical Examination

Written consent was taken before examining the patient. Cervical compression-distraction tests, Upper limb neural tissue tension test, Vertebrobasilar insufficiency test, and cervical range of motion were assessed. All the findings were negative ruling out the possibility of cervical spine involvement.

Investigations

Investigations (MRI, CT Scan of Brain and Spine, Lab investigations, X-ray Skull, and cervical spine) ruled no underlying pathology.

Outcome Measures

The pain was assessed by the Visual Analog Scale (VAS). It is a unidimensional measure of pain related to intensity. It is a patient self-administered scale having a range from 0 to 10 on a straight horizontal line with equidistant points. The point '0' indicates no pain, '5' indicates moderate pain and '10' indicates severe pain. The impact of migraine was assessed by Headache Impact Test (HIT). The impact of migraine on work productivity was assessed by the Work Productivity and Activity Impairment (WPAI) questionnaire. WPAI-GH is expressed in percentages by multiplying the scores by 100. It has four components.

Percent work time missed due to health = $Q2/(Q2 + Q4)$ for those who were currently employed.

Percent impairment while working due to health = $Q5/10$ for those who were currently employed and worked in the past seven days.

Percent overall work impairment due to health $Q2/(Q2 + Q4) + ((1 - Q2/(Q2 + Q4)) \times (Q5/10))$.

Percent activity impairment due to health $Q6/10$.

The overall mean of the four components was also

calculated. All the outcome measures were measured pre-treatment, Post-treatment after completion of all four sessions, and after one-month follow-up.

Interventions

Endonasal cranial balloon release technique was given to the patient. The patient had four continuous sessions. The patient didn't take any other forms of therapy nor analgesics during and after the therapy.

Procedure

Endonasal cranial balloon release: It is a powerful physical technique that adjusts the bones of the skull and face. After explaining the entire procedure and assurance, the patient is made to lie supine on the treatment couch. Nasal Skeletal Release is performed using a finger cot/balloon attached to a blood pressure bulb. (Figure 2) The finger cot is lubricated and then placed into each of the six nasal passages one by one. Once the balloon is positioned properly, the balloon is then quickly inflated which mobilizes the bones of the face and cranium. It is a very quick procedure and feels similar to the sensation of water shooting up in the nose. The opposite nostril is lightly compressed to prevent air from escaping. The patient takes a deep breath through the mouth and holds it then the finger cot is gently inflated making its way into the nasopharynx, causing it to widen. The finger cot is inserted into the inferior turbinate of the nose on both sides on the first day, then into the middle turbinate on the second day, then into the upper turbinate on the third day, and then into all three nasal passages of both sides on the fourth day. The patient was given four treatment sessions on continuous days.

Figure 2: endonasal balloon release instrument



RESULTS

The outcome measures are measured pre-intervention, post-intervention, and after one-month follow-up. The patient had a reduction in pain, improved work productivity, and decreased migraine-related symptoms. The summary of the scores is tabulated in table 1.

Table 1: Outcome Measures pre-intervention, post-intervention and after one month follow up

Outcome measure		Pre-intervention	Post-intervention	After one-month follow-up	P<0.05
Pain vas*		9	1	1	
Hit		78%	46%	42%	
Wpaat-gh	Percent work time missed due to health	15.68%	2.27%	2.27%	
	Percent impairment while working due to health	90%	10%	10%	
	Percent overall work impairment due to health	91.56%	11.8%	11.8%	
	Percent activity impairment due to health	80%	10%	10%	

*Measured out of a total score of 10.

DISCUSSION

After four continuous sessions of Endonasal Cranial balloon release, the patient had relief from pain and migraine-related symptoms. The Pain VAS score reduced from 8 to 0 and the, HIT score reduced from 78% to 46%. Endonasal Cranial balloon release also known as Cranial Facial Release (CFR) technique was derived from the Richard Stober technique. The mechanism of action behind the Endonasal cranial balloon release technique is to induce mobility in the cranial system –especially sphenoid bone which facilitates the normal cranial respiratory function ⁽⁶⁾. After the manipulation, there will be an unrestricted and smooth flow of CSF ⁽⁷⁾. The Endonasal Cranial Balloon release will align the bones of the skull for optimal blood flow to the brain and spinal. The neurotransmitter activity is also optimized.

Manipulative therapy is regarded as the best treatment option in relieving headaches due to migraine in a study by Nelson CF et.al (1998), have reported that cervical spine manipulations can result in a decrease in headaches. Manipulative therapy had been suggested as a treatment option in many studies. In the case of craniofacial bones, the high-velocity low amplitude thrusts are not possible as the range of motions in the craniofacial bones is very minimal. The Endonasal Cranial balloon release technique is the optimal option for mobilizing these bones.

Sphenomandibularis muscle is often associated with retro-orbital and temporal headaches. The Endonasal cranial balloon release technique can release the spasm of the muscle resulting in the relaxation and relief of pain.

Migraine is a major concern among the workers and their productivity. Several studies across multiple countries reported that migraine causes loss of productivity and monetary loss among the workers ⁽⁸⁾. In this present study, our client is an Assistant professor, who involved herself in teaching and other academic activities. The

migraine headaches prevented her from participating actively in academic activities. After the treatment session, she started her academic activities and had no complaints about productivity.

CONCLUSIONS

This study concludes that the Endonasal Cranial Balloon Release technique would reduce the pain and discomfort due to migraines without remissions. It rehabilitates the worker with improved productivity. We also suggest several randomized clinical trials should be conducted to identify the potential benefits of this therapy.

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