



**University Hospitals**

Department of Plastic and Reconstructive Surgery

## Surgical Treatment of Migraine Headaches



“Being migraine-free for eight years has been a dream come true. I live my life now with a freedom that I hadn’t known for more than 20 years.”

– Kathy Kramer, Hudson, Ohio

For an individual consultation, please call 440.461.7999 | [UHhospitals.org/plastics](https://UHhospitals.org/plastics)

## About Dr. Guyuron



Bahman Guyuron, MD

Currently serving as the President of the American Association of Plastic Surgeons, Bahman Guyuron, MD, is the Chairman of the Department of Plastic and Reconstructive

Surgery at University Hospitals Case Medical Center. Throughout his career, he has served in leadership roles in numerous local, regional and national organizations for plastic surgery.

- Dr. Guyuron has been extremely involved in the education of plastic surgeons through his participation in over 925 presentations at conferences around the world, as well as lectures in 22 countries as a Visiting Professor.
- Dr. Guyuron has published over 175 articles in peer-review journals, 43 book chapters, and two textbooks.
- He is consistently ranked among the Best Doctors in Cleveland and the Best Doctors in America.

## Background on Migraine Surgery

Dr. Guyuron pioneered migraine surgery. It began as mere serendipity when patients who had undergone forehead rejuvenation informed Dr. Guyuron that their headaches had gone away. These reports prompted him to begin the investigation of 314 patients who had undergone forehead rejuvenation, which revealed that 31 of 39 who had migraine headaches had either complete elimination or significant improvement. This encouraging study led to a pilot study involving patients who underwent surgery for treatment of migraine headache and 21 out of 22 patients experienced either complete elimination or a significant improvement of migraine headaches. Compelled with the results of this study, his research team, including three neurologists, has conducted ten evidence-based research studies to prove that this surgery not only works, but that the results are enduring.

## How does surgery work?

It was stated by a neurologist over 30 years ago that migraine headaches are triggered by stimulation of the terminal end branches of the trigeminal nerve. What the neurologist was unable to explain at the time is what irritates these nerve branches. This theory was pushed aside for decades. Dr. Guyuron, through his research and clinical observations, was able to put the pieces of the puzzle together and demonstrate that the nerve branches are stimulated by the surrounding structures such as muscles, vessels, bones, and cartilage, elimination of which will cease migraine triggers. The irritation of these branches results in release of substances that begin a cascade of events that lead to inflammation of the nerves and membranes around the brain causing symptoms similar to meningitis. These include nausea, vomiting, and sensitivity to lights and sounds. This is why patients usually retreat to a dark and quiet room and try to sleep off the migraine headache. Over the years and as a result of the completed anatomical and clinical research studies, Dr. Guyuron has identified four

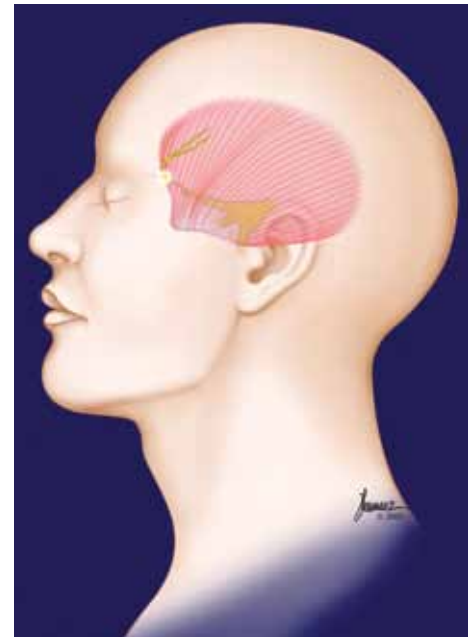


Figure 2

very common and some uncommon trigger sites. He has developed surgical techniques to deactivate these trigger sites and alleviate the migraine headaches. His surgical techniques have been designed in such a way so as to cause the least amount of physiological change locally. In fact, in three sites, the surgery has some side benefits. For example, surgery for migraine headaches in the forehead area involves removal of the frowning muscles (*Figure 1*) which irritate two nerve branches on each side and cause forehead migraine headaches. In addition to stopping the migraine headaches, it results in improvement in the forehead appearance by elimination of the frown lines. In the temple area, the tissues are pulled sideways which results in a gentle lift of the eyebrows and causes rejuvenation of the temples.

The surgery in the temple trigger site involves removal of a tiny branch of the trigeminal nerve that provides feeling to this site (*Figure 2*). This nerve has been detached for years for a variety of reasons including

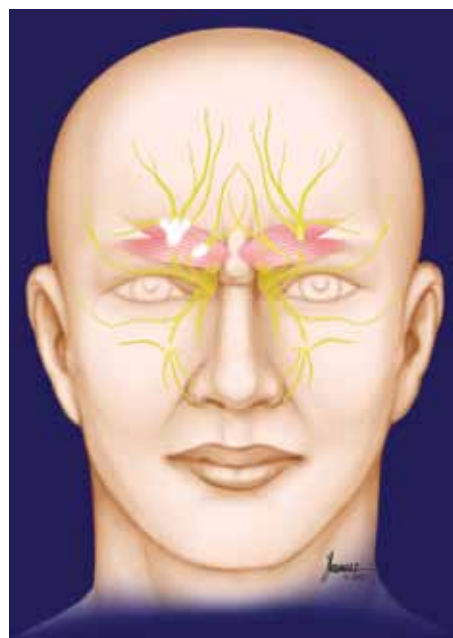


Figure 1

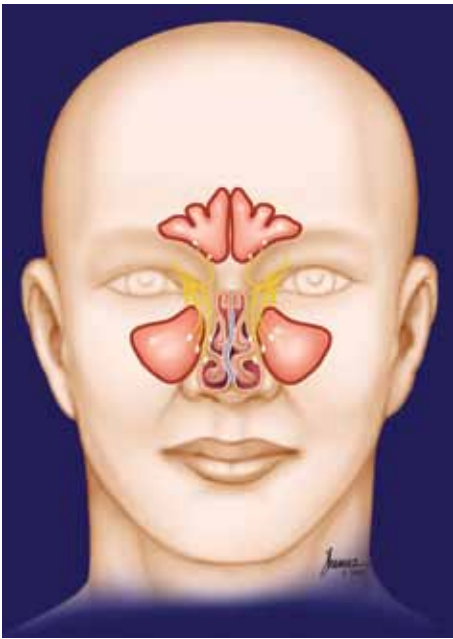


Figure 3

surgery around the eye socket and even cosmetic forehead procedures. Removal of this nerve causes temporary or permanent numbness of the temple. Patients do not find the reduced sensation or loss of feeling in this area disturbing since this is not a highly sensitive area. In fact, removal of this nerve, which exits from the muscle site one usually rubs while having tension or migraines in the temple area, takes away migraine and other headaches arising from this area.

Another trigger site is the septum, the partition inside the nose that divides the interior nose into two spaces. Also, enlargement of the projections inside the nose called the turbinates can trigger headaches. When there is contact between the turbinates and the deviated portion of the septum or the irregularities within the septal wall, these can trigger migraine headaches (Figure 3). After the surgery on the septum and turbinates, which includes straightening the septum and reduction of the size of the turbinates, not only do patients observe improvement or elimination

of the migraine headaches, they also experience improved breathing (the third example of a side benefit).

The fourth most common site is the back of the head where several nerves can be the source of migraine headaches (Figure 4). The most common nerve involved in migraine headaches in this site is called the greater occipital nerve which is a nerve that originates from the upper portion of the cervical spine (neck). This nerve can be compressed by the surrounding muscles or vessels. During the surgery, a small piece of muscle is removed from around the nerve and replaced with fatty tissues from underneath the skin to shield the nerve and separate it from the muscles so the chance of recurrence of the pain will be extremely remote. Additionally, this nerve is decompressed (released) in several sites through the same incision. If the greater occipital nerve is irritated frequently, it can become chronically inflamed which is called occipital neuritis. The treatment is essentially the same.



Figure 4

There are other less common trigger sites which include the area right above or behind the ear. The pain in this site is eliminated or reduced by removal of a vessel that is compressing and irritating the nerve.

### Where are the incisions?

The surgery is done using minimally invasive techniques. For deactivation of the forehead and temple trigger sites in combination, five or six small incisions are made, each approximately a half inch long. All of the incisions are located within the hair-bearing skin so that they are not often visible after they heal, as long as the patients heal normally. For isolated forehead migraine headaches, which are extremely rare, the incision can be made in the upper eyelid crease, an incision that is commonly used for cosmetic eyelid surgery. This area heals very favorably on most patients. For the patients with isolated temple headaches, two incisions, each a half inch long, will be in the temple hair. Surgery in the back of the head is done through an incision about one and a half inches long located in the middle of the scalp right above the neck within the hair-bearing skin. The surgery on the septum and turbinates is done through the nostrils and there are no incisions related to the surgery that can be visible.

### What are the risks of the surgery?

Any surgery has potential risks. This operation is no exception. However, complications are usually minimal and rare. Infection and bleeding occur, but is highly unlikely. There will be some numbness associated with the surgery that everybody experiences and is an expected part of the surgery and is not considered a complication. There is a chance that the numbness can be long lasting or permanent. Rarely, minimal hair loss around the incision can

occur. Another possible, but extremely rare, complication is development of a neuroma (scar tissue around the nerves). The nose can become drier after the surgery. If this occurs, it is usually temporary. In rare cases, this can become permanent. Damage to the nerves that move the muscles may occur, although this is extremely rare. Blood clots can occur in the legs or may travel to the lungs, but this is exceedingly rare. Life threatening complications can occur, but are extremely unlikely as well.

### **What are the chances of success from the surgery?**

Our studies have demonstrated a success rate of between 83-92%. Success is defined as at least a 50% reduction in migraine headache frequency, intensity, or duration. However, more and more, Dr. Guyuron is achieving complete elimination because of his experience in detecting the trigger sites and some refinements in the techniques that he has implemented over the last ten years since he began doing this surgery.

### **Where is the surgery performed?**

The surgery is usually performed as an outpatient operation in a facility adjacent to Dr. Guyuron's office.

### **What type of anesthesia is used?**

The majority of the procedures are done under general anesthesia and usually the patient spends about half a day in the facility.

### **What kind of postoperative care is needed?**

When you go home, there are often one or two drain tubes under the scalp that are connected to a small vacuum tube that will be removed in a few days. Someone has to stay with you for the first night to assist in changing the

vacuum tubes and help you in case of an emergency. There will be a need for application of some ointment on the incisions periodically during the first week. All of the stitches are dissolvable and they do not need to be removed.

### **Who is a candidate for surgery?**

Anyone who has at least two or three severe migraine headaches a month that would not respond to over-the-counter medications, those who are tired of taking migraine medications, and those who experience migraines that interfere with their personal and professional lives would be a candidate for this surgery. This is especially true for those who have frequent migraine headaches and do not tolerate the migraine medications or have experienced side effects from the medications.

### **What kinds of tests are needed?**

Patients undergo standard testing as outlined in the anesthesia policy. In addition, for patients who have pain behind the eye, a CT scan is usually required to document the abnormalities inside the nose and sinuses which are not easily visualized by simple inspection inside of the nose.

### **What is the recovery like?**

After you recover in the facility, you will return home, to a condominium close to the outpatient setting, or to a hotel room close to the surgical facility. The drains are usually removed in two to four days. You will ultimately experience some swelling and bruising which, on average, lasts eight to ten days. You are presentable within two weeks after surgery and can resume your social activities, depending on the trigger site. You will need to avoid heavy exercise for about three weeks. Usually there are no limitations after this period. On patients who undergo

septum and turbinate surgery, it may be necessary to irrigate the nose once or twice a day for a period of three to six weeks.

### **How do I prepare for surgery?**

You will be asked to avoid aspirin or aspirin-containing medications for three weeks before and one week after surgery and will be provided with a list of medications and food products you need to avoid. Strict adherence to the instructions that you will receive from the surgical team will ensure a safer operation and quicker recovery.

### **When will I notice improvement?**

Depending on the trigger sites, the results could be immediate or may take several weeks. With the septum and turbinate surgery, it may take several weeks or rarely several months to observe the improvements from the surgery.

### **What happens if my migraine headaches do not go away?**

This commonly is the consequence of a trigger site that was not identified because it was dormant or was overshadowed by the other, more major, trigger sites. You can always have surgery on the other trigger sites that were not detected earlier. It is extremely rare for the surgery to totally fail. The pain in the operative site may go away completely and you may develop pain somewhere else, which could be treated.

### **Can I take my migraine medications after the surgery?**

If you have migraine headaches, you can continue with your migraine medications, as long as they do not contain aspirin or advil. However, the need for these medications becomes extremely small.