# Microvascular Decompression for Hemifacial Spasm: The Definitive Cure for a Disabling Disease

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## What is hemifacial spasm?

Hemifacial spasm (HFS) is a neurological disorder in which muscles of one side of the face intermittently involuntarily contract, causing uncontrollable contortion of the face. HFS typically begins in the muscle surrounding the eye and can spread to involve other muscles on the same side of the face. Spasms can worsen over time in both frequency and severity, leading to nearly constant severe disfigurement with a grimacing expression. HFS can worsen in times of stress and fatigue, increasing the burden of anxiety on those who suffer from the disorder. Hemifacial spasm is restricted to one side of the face. It is extremely unusual for a person to have hemifacial spasm on both sides of the face and in these cases the spasm never starts on both sides of the face at the same time.

## What causes hemifacial spasm?

HFS is caused by hyperactivity of cranial nerve VII, aka the facial nerve, which originates in the brainstem and controls muscles of facial expression. The most common cause of HFS is irritation of the facial nerve from compression by an adjacent artery or vein. Rarely, a tumor or lesion in the brainstem can cause HFS.

## How is the diagnosis of hemifacial spasm made?

HFS is a clinical diagnosis- the pattern of symptoms of involuntary one-sided facial twitching is used to make the diagnosis. Once a diagnosis of HFS is suspected, a person should undergo MRI of the brain with intravenous contrast to ensure that a rare tumor or brainstem lesion is not responsible for the symptoms. While MRI will sometimes show an artery or vein coursing near the facial nerve raising suspicion for the cause of facial nerve irritation, it is important to note that in the majority of people with HFS the offending artery or vein cannot be detected by imaging but is later found upon direct visualization during surgery for treatment. Therefore, while all people should have an MRI to rule out the presence of a rare cause of HFS, most people will not have the cause of their HFS seen on MRI.

## What conditions can be confused with hemifacial spasm?

Blepharospasm is sometimes confused with hemifacial spasm, but the simultaneous involvement of both eyes makes it relatively easy to exclude hemifacial spasm in these

cases. Facial myokymia can involve just one side of the face. The movements are finer, more continuous and more frequently start somewhere in the face other than around the eye. Conditions affecting the brainstem directly are responsible for this type of facial movement disorder and can be detected by MRI scans.

Unusual forms of facial dystonia can produce unilateral facial contortion, but not usually the rapid intermittent contractions of hemifacial spasm. Habit tics can be difficult to distinguish, but often have a more definite relationship to stress, are not present during sleep, begin somewhere in the face other than around the eye or are controllable by the patient.

If the distinction is difficult, there is a specific pattern of hemifacial spasm that can be identified with a test called electromyography (EMG) of the face.

**What are the treatment options for HFS?**

Medications are ineffective for treatment of HFS. Two treatment options exist: Botulinum toxin (Botox®) injections and surgical exploration of the facial nerve to identify and treat the site of facial nerve irritation, a procedure known as microvascular decompression (MVD).

**Is acupuncture, massage therapy, or physical therapy effective in treating HFS?**

Anything that reduces stress can reduce the occurrence of HFS, but cannot prevent or cure HFS.

**What is Botox®? What are the risks and benefits of Botox® injections to treat HFS?**

Botox® is a temporary treatment of the symptoms of HFS. It does not treat the cause of HFS. Botox® is a bacterial toxin injected by needle into facial muscles that paralyzes the muscles so that they do not move when facial nerve hyperactivity occurs in HFS. While this prevents the facial grimacing seen in HFS, it also prevents normal facial movement at the sites of injection. Therefore the affected side of the face remains somewhat asymmetric, albeit much less so than if contorted into a hemifacial spasm. Botox® injections are temporary, with median length of effect lasting 11 weeks, and can be repeated. However, over time, Botox injections have lessening effect on treating hemifacial spasm, and can cause permanent atrophy or paralysis of facial muscles. This may be a good option for some patients whose risk for surgery is unusually high or for whom temporary relief is desired.

**What is microvascular decompression (MVD) surgery? What are the risks and benefits of MVD to treat HFS?**

MVD is the only known proven cure for HFS. MVD is a neurosurgical procedure originally described by Dr. Peter Jannetta and designed to eliminate the cause of HFS: irritation of the facial nerve by an artery or vein. The surgery involves exploring the facial nerve where it originates and exits the brainstem, where an artery or vein can

commonly be found compressing the nerve and causing irritation. MVD surgery is performed by a neurosurgeon with the patient asleep under general anesthesia through an incision located one finger breadth behind the ear, extending about the length of the ear. Hair shaving is not necessary. During MVD, the neurosurgeon places small biocompatible pads between the facial nerve and any compressive artery or vein to prevent the nerve from becoming irritated and sending the hyperactive signals that cause spasm in facial muscles. MVD permanently cures HFS in the vast majority of patients, with clinical studies showing that 85 - 90% of patients achieve total remission lasting for a 10-year follow-up period. Risks of MVD related to surgery include a 1% risk of infection, 3% risk of developing leaking of cerebrospinal fluid from the surgical site which can require another surgical procedure to fix, 1.4% risk of permanent facial nerve weakness, a 3 - 4 % risk of decreased hearing on the side of surgery and a less than 1% risk or stroke, which can cause permanent symptoms.

During surgery it is possible to monitor the hemifacial spasm and determine that it has resolved. This guides the surgeon to do enough decompression to relieve the problem without doing more surgery than necessary. It helps prevent complications and assists the neurosurgeon in performing adequate decompression of the facial nerve.

**How long is the hospital stay after MVD surgery?**

Average hospital stay is two to three days after the surgery.

**How effective is Botox® versus MVD in treatment of hemifacial spasm?**

Both treatments are highly effective in relieving symptoms of HFS. However, only MVD offers potential to cure HFS.

**Can I have MVD if I have previously had Botox® therapy?**

Yes. However, it is recommended to wait until the effects of the Botox injection have worn off (usually 3-6 months after the last Botox therapy) before having MVD surgery because residual effects of Botox can prevent safe monitoring of facial nerve function during surgery.

**Who is not a candidate for MVD surgery?**

Every person who suffers from HFS is a candidate for MVD. Each person should be evaluated on an individual basis by a neurosurgeon to determine the best treatment for his/her HFS.

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