

Hemifacial Spasm – A Case Report

Clay W. Walker, MSPA, PA-C
Department of Family Medicine

ABSTRACT

Hemifacial spasm is an uncontrollable, recurrent facial muscular contraction that nearly typically occurs on one side of the face, is insuppressible, and can last throughout the entire day. The most common underlying cause of facial nerve compression is an enlarged or abnormal tracking blood vessel at the brainstem level.

In this case, a 53-year-old female presented with concerns of right eyelid spasms with elevation of the right eyebrow during these episodes that began one week prior. She also described blurring of vision over the previous three months, but without any ptosis or subjective weakness in the eyes or eyelids. In addition, the patient reported no other facial spasms, numbness, or weakness. The patient had a noted history of breast cancer in 2017, treated with chemotherapy, and was told that she was in remission. She reported consumption of only one cup of coffee weekly with no nicotine usage. She reported no additional life stressors over this time from her baseline.

Vital signs revealed a weight of 208.7 lbs (94.7 kg) and was 61.37 in (155.9 cm) tall, for a BMI of 39. Blood pressure was 130/80 mmHg, heart rate was 76 beats/minute and regular, and the oral temperature was 99.6 degrees Fahrenheit (37.6 degrees Celsius). The patient was oriented to person, place, and time, with intact recent and remote memory. Speech was intact with an appropriate fund of knowledge and concentration.

Cranial nerve examination II through XII was without focal neural deficit, aside from cranial nerve VII revealing intermittent episodes of spasms in the upper eyelid and simultaneously elevation of the right eyebrow was observed.

The patient was initially evaluated with laboratory testing, including a basic metabolic panel which resulted within normal limits. Acetylcholine receptor binding antibodies and Muscle-specific Tyrosine Kinase autoantibodies were completed. Which resulted within normal limits, respectively.

After literature and guideline review, these concerns led to an MRI of the face with and without contrast. This study revealed that the right anterior inferior cerebellar artery, arising at the level of the verteobasilar confluence, extends cephalad into the right pontomedullary sulcus, elevating and distorting the right facial nerve at its root exit point and along the proximal attached segment.

The patient was referred to neurosurgery for evaluation and discussion of treatment options. Treatment modalities were reviewed, including Botox injections for symptomatic improvement and the option of surgical microvascular decompression.

Neurosurgery noted that if Botox injections were elected, and if this treatment failed, microvascular decompression involving moving the artery away from the seventh cranial nerve and transposition with surgical glue would be recommended.

At the time of the encounter, the patient elected to proceed with Botox injections as this was the least invasive of the options. Additionally, neurosurgery recommended completing an EMG (electromyography) of the face to assess for lateral spread.

CASE PRESENTATION

Setting: Outpatient Family Medicine Office **Patient Demographics:** 53-year-old, Hispanic female

Chief Complaint & History of Present Illness:

- Spasms of right eyelid spasms that began one week prior, along with elevation of the right eyebrow during these episodes for the last seven days

Associated Symptoms:

- (+) blurring of vision over the previous three months,
- (-) ptosis or subjective weakness in the eyes or eyelids
- No other facial spasms, numbness, or weakness no back pain, change in bowel habits, chest pain, diarrhea, dysphagia, flank pain, hematemesis, hematochezia, jaundice, melena, nausea, or odynophagia.

Aggravating and Relieving Factors: None

Past Medical History:

- Right breast cancer
- Obstructive sleep apnea

Medications:

- Letrozole, 2.5 mg orally daily

Social History:

- Never a cigarette smoker
- No alcohol beverage consumption
- No illicit drug abuse

Family Medical History:

- Father: hypertension, type 2 diabetes, CVA
- Mother: Asthma
- Sister: Rheumatoid arthritis

Physical Examination:

- Vital Signs:**
 - Height: 61.37"
 - Weight: 208.7 pounds
 - BMI: 39 kg/m²
 - Blood Pressure: 130/80 mmHg
 - Pulse: 76 bpm
 - Respirations: 18/minute
 - Temperature: 99.6 degrees Fahrenheit

CASE PRESENTATION (CON'T)

- HEENT:**
 - Head: Normocephalic and atraumatic.
 - Eyes: Extraocular movements intact.
 - Conjunctiva/sclera: Conjunctivae nonerythematous.
 - Pupils: Pupils are equal, round, and reactive to light.
 - Neck: Normal range of motion and neck supple with no masses or LAD appreciated
- Cardiovascular:**
 - Rate and Rhythm: Normal rate and regular rhythm.
 - Pulses: Normal pulses.
 - Heart sounds: Normal heart sounds.
- Pulmonary:**
 - Effort: Pulmonary effort is normal.
 - Breath sounds: Normal breath sounds.
- Abdominal:**
 - General: Bowel sounds reveal borborygmi. No areas of tenderness to palpation
- Skin:**
 - General: Skin is warm and dry.
 - Capillary Refill: Capillary refill takes less than 2 seconds.
- Neurologic:**
 - General: No focal deficit present.
 - Mental Status: She is alert and oriented to person, place, and time
 - The cranial nerve examination was without focal neural deficit noted as below, aside from the following:
 - Cranial nerve VII revealed intermittent episodes of spasms in the upper eyelid, and simultaneously elevation of the right eyebrow was observed**
- Psychiatric:**
 - Mood and Affect: Mood normal. Behavior: Behavior normal. Thought Content: Thought content normal. Judgment: Judgment normal

DIFFERENTIAL DIAGNOSES

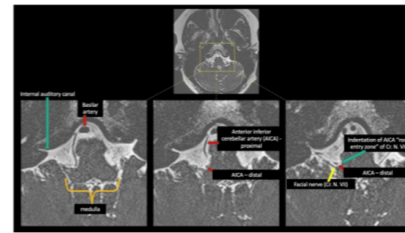
- Tics:** Repetitive, individually recognizable, intermittent movements or movement fragments that are almost always briefly suppressible and are usually associated with awareness of an urge to perform the movement
- Hemifacial spasm:** Involuntary synchronous spasms of one side of the face, usually beginning around the eye. They are typically brief, irregular clonic movements but are occasionally tonic. The disorder almost always presents unilaterally, although bilateral involvement may occur in severe cases (less than 5 percent overall). Brief clonic movements are first noted in the orbicularis oculi and spread over months to years to involve other facial muscles. It never involves muscles other than those innervated by the facial nerve
- Myokymia:** Affects only the eyelid. This type of twitch or spasm is very common and happens to most people at one time or another. It can involve either the upper or lower lid, but usually only one eye at a time
- Blepharospasm:** focal dystonia characterized by involuntary contractions of the orbicularis oculi muscles, resulting in the bilateral closure of the eyes
- Meige syndrome:** Or craniocervical dystonia encompasses the dystonic contractions of blepharospasm in addition to spasms of the lower facial muscles, jaw, and neck
- Complex motor seizure**
- Intracerebral pathology/malignancy,** others?

CASE PRESENTATION

- Course of Care:**
- Initial laboratory evaluation was completed with a basic metabolic panel which revealed elevated calcium at 10.2 mg/dL (normal range, 8.6 to 10.0 mg/dL). The remainder of the basic metabolic panel was unremarkable
 - A subsequent albumin level was completed, which was found to be 4.6 g/dL (normal range; 3.5 to 5.0 g/dL). Therefore, the calculated adjusted calcium was 9.7 mg/dL (normal range, 8.6 to 10.0 mg/dL)
 - With the patient's concern of blurred vision for the previous three weeks, in addition to the eyelid symptoms, acetylcholine receptor binding antibodies and MUSK (Muscle-specific Tyrosine Kinase) autoantibodies were completed to assess for myasthenia gravis. This test resulted with 0.00 (normal value; <=0.02 nmol/L) and 0.00 nmol/L (0.00-0.02 nmol/L) respectively
 - Due to the patient's atypical presentation of periocular spasm with the elevation of the ipsilateral eyebrow, there was the concern of hemifacial spasm potentially caused by compression or other pathology to the facial nerve
 - After literature and guideline review, these concern led to an MRI of the face with and without contrast
 - This revealed the right anterior inferior cerebellar artery, arising at the level of the verteobasilar confluence, extends cephalad into the right pontomedullary sulcus, elevating and distorting the right facial nerve at its root exit point and along the proximal attached segment

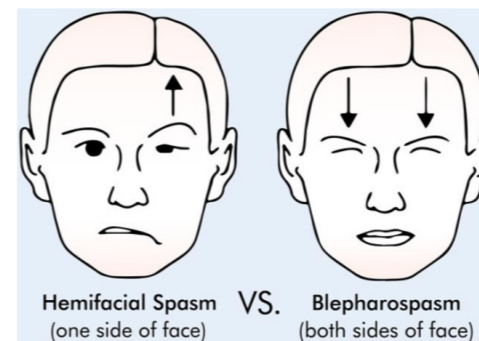
RESULTS

BMP		
Potassium	4.5 mmol/L	3.6-5.2 mmol/L
Sodium	143 mmol/L	135-145 mmol/L
Chloride	103 mmol/L	98-107 mmol/L
Bicarbonate	26 mmol/L	22-29 mmol/L
Anion Gap	14	7-15
BUN	10.6 mg/dL	6.0-21.0 mg/dL
Creatinine	0.72 mg/dL	0.59-1.04 mg/dL
eGFR	>90 mL/min/BSA	>90 mL/min/BSA
Calcium (Total)	10.2 mg/dL	8.6-10.0 mg/dL
Glucose	92 mg/dL	70-140 mg/dL
Albumin	4.6 g/dL	3.5-5.0 g/dL
Correct Calcium	9.7 mg/dL	8.6-10.0 mg/dL
MuSK Autoantibodies	0.00 nmol/L	0.00-0.02 nmol/L
Ach Receptor Ab	0.00 nmol/L	0.00-0.02 nmol/L



DISCUSSION

- Introduction:**
- A movement disease known as hemifacial spasm (HFS) is characterized by uncontrollable, sporadic, irregular spasms, particularly on one side of the face
 - Compression by a blood vessel of the facial nerve at the root entry zone results in primary HFS, which is the most common etiology
 - However, there are secondary causes of disease such as:
 - Trauma, Bell palsy, demyelinating plaques from multiple sclerosis affecting the brain stem, stroke, arteriovenous anomalies, intracranial arterial aneurysm, arterio-venous fistula, angiomata, mastoid and ear infections (otitis media, cholesteatoma), parotid gland tumors, Chiari malformation and other structural anomalies of the posterior cranial fossa
 - Other differentials may include myokymia, facial tics, blepharospasm, and Meige syndrome (craniocervical dystonia)
- Prevalence:**
- Hemifacial spasm affects 14.5 for every 100,000 women and 7.4 for every 100,000 men worldwide
 - This indicates that women are roughly twice as likely as men to experience hemifacial spasm [1]
 - Hemifacial spasm often manifests in adults, particularly during the fourth and sixth decades of life
 - Most documented instances show that it affects the left side of the face more often than the right
 - Although there are a few uncommon reports of familial hemifacial spasm in the scientific literature, most episodes of hemifacial spasm are often sporadic in nature



<https://researchwillshamefacialspasm.com/hemifacial-spasm-cause-and-symptoms/>

DISCUSSION (CON'T)

- Presentation:**
- The initial sign of hemifacial spasm is often an asymmetric twitch of the eyelid muscle, specifically the orbicularis oculi, which can cause the eye to be pulled closed
 - The lower facial muscles innervated by the facial nerve may then progressively become affected by the spasm, which may culminate in the mouth being pulled to one side
 - Another presentation can involve the upper facial muscle being affected, causing elevation of the eyebrow
 - This is often referred to as the "other Babinski sign," which distinguishes hemifacial spasm from blepharospasm and is a pathognomonic marker of hemifacial spasm
- Diagnosis:**
- Clinical evaluation with a thorough history and a neurological and focused physical examination are used to make the clinical diagnosis of hemifacial spasm
 - It is essential to rule out any vascular malformations or tumors at the facial nerve's brainstem exit point in situations when facial nerve compression is suspected
 - Better visualization is possible using advanced MRI scanning techniques, including high-resolution T1- and T2-weighted spin-echo or gradient-echo imaging with gadolinium
 - MR angiography is reserved for those who are undergoing presurgical planning
 - When challenging to identify clinically between facial myokymia, blepharospasm, complex partial motor seizures, or motor tics, an electromyogram (EMG) can be employed
 - Several EMG findings may raise suspicion of hemifacial spasm, including:
 - Lateral spread and varied synkinesis on the blink reflex test as the diagnostic finding on electrophysiological testing
 - Contraction of facial muscles supplied by an alternative branch when one branch of the facial nerve is stimulated
 - Needle EMG showing irregular motor unit potentials with high frequency (150 to 400 Hz), with facial twitching
- Treatment:**
- The main objective of treatment is to lessen the irregular muscular contractions brought on by unpredictable impulses to nearby neurons
 - Depending on the underlying cause and severity of the illness, hemifacial spasm can be treated medically or surgically
 - Due to its effectiveness and few adverse effects, botulinum toxin injections are now the treatment of choice for hemifacial spasm, after assessment for tumors or vascular abnormalities
 - Oral medication such as haloperidol, gabapentin, carbamazepine, baclofen, and benzodiazepines (clonazepam) show some effectiveness in reducing spasms, although the outcomes are variable.
 - The main disadvantage of the majority of these drugs is the long-term use-related adverse effects, such as severe sedation and lethargy
 - Nevertheless, oral medications may be considered a first-line treatment option when a patient is hesitant to have botulinum toxin treatments or is not a strong surgical candidate
 - Surgery is recommended in the most severe cases of hemifacial spasm and those who have not responded to botulinum toxin treatment
 - Microvascular decompression is the preferred technique, which involves freeing the facial nerve from the errant blood vessel that is placing pressure at the brainstem level
 - The typical success rate of microvascular decompression surgery after the first year is between 80 and 88 percent [4]
- Conclusion:**
- Hemifacial spasm is an uncontrollable, recurrent facial muscular contraction that typically occurs on one side of the face, is insuppressible, and can last throughout the entire day
 - The most common underlying cause of facial nerve compression is an enlarged or abnormal tracking blood vessel at the brainstem level
 - Clinical diagnoses are frequently based on a patient's medical history and physical examination. Before deciding on a course of action, however, MRI and potentially EMG are performed to determine the underlying etiology
 - Due to its high effectiveness (success rates of 85% to 95%) and low frequency of adverse effects, botulinum toxin is the preferred therapy for hemifacial spasm; but still, it merely provides transient symptomatic alleviation. Surgical microvascular decompression is the only therapeutic approach that targets the fundamental cause of a condition—and has an average success rate of 85%.
 - The purpose of this case report is to bring attention to an uncommon diagnosis, which with knowledge and awareness, can be identified by the primary care provider and treated effectively, leading to avoidance of significant short and long-term deficits, social embarrassment, anxiety, and depression among affected patients

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