Natural History of Untreated Hemifacial Spasm: A Study of 104 Consecutive Patients over 5 Years

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Keywords

Hemifacial spasm · Natural history · Clinical outcome · Treatment

Abstract

Background: The natural history without treatment of a large series of hemifacial spasm (HFS) patients has not been well-documented. **Objective:** The purpose of this study was to characterize the natural history and clinical outcome in patients with HFS. **Methods:** The initial visits of all 2,155 patients and the diagnosis of HFS took place between 2001 and 2010. In 1,775 of the patients, compressing vessels were identified on magnetic resonance imaging. Of these, we excluded 1,469 patients (82.8%) who received microvascular decompression, 101 (5.7%) who continued to visit the clinic for botulinum toxin injections, and 9 (0.5%) who died or suffered from other diseases. Ninety-two (5.2%) of the patients were lost to follow-up; the remaining 104 were followed up for 5–42 years (mean 12 years) after the onset of the symptoms of HFS. **Results:** The condition was aggravated in 11 (10.6%) of the 104 patients and stationary in 40 (38.5%) for 6–42 years (mean 13 years). Ten (9.6%) improved partially for 7–18 years (mean 11 years). Forty-three (41.3%) were in remission for between 2 months and 23 years (mean 6.4 years)

after onset and required no further treatment for 5 months to 13 years (mean 5.7 years). **Conclusion:** This study provides useful information to HFS patients for understanding the disease and determining treatment.

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Introduction

Hemifacial spasm (HFS) is characterized by unilateral, paroxysmal, involuntary movement occurring in the muscles innervated by the ipsilateral facial nerve. The involuntary contractions usually begin in the orbicularis oculi muscle and gradually spread to the other muscles related to facial expression [1]. Since HFS can affect facial appearance, long-standing disease frequently leads to social isolation. Such problems invariably impact the patient's self-image and satisfaction with various aspects of life [2]. HFS has been attributed to compression of the facial nerve by an ectopic anatomical or pathological structure that results in ephaptic transmission [3].

To date, consensus has been reached that most patients need to receive treatment because HFS rarely remits spontaneously [4]. Most studies have found treatment with medications unsatisfactory [3, 5]. On the other

hand, many studies have established the efficacy of botulinum toxin therapy or microvascular decompression (MVD) in the treatment of HFS [3–14].

Incidentally, many patients are curious about what will happen if not treated. They also spend a lot of time agonizing over whether to get treatment because of the cost, limits, and risk involved. In addition, they expect to improve spontaneously because there are spasm-free intervals.

The natural history without treatment of a large series of HFS patients has not ever been well-documented. Previous research has reported the clinical outcome after botulinum toxin therapy or MVD. In the study by Mauriello and Aljian [9] on 13 HFS patients with botulinum toxin injections, 7 were treated continuously and 1 had 1 injection with good results but was not sufficiently bothered to return for reinjection. There were no patients in remission. In the study by Mauriello et al. [4], 55 of 119 patients were treated with botulinum toxin injections, and 5 (4.2%) experienced apparent spontaneous resolution of their condition after receiving the injections for 1–9 years. In the study by Defazio et al. [7], 70 of 86 patients continued botulinum toxin injections and 2 (2.3%) experienced complete and long-lasting relief of symptoms. In cases of patients treated with MVD, many researchers report a success rate of approximately 85–95% postoperatively [1, 8, 10, 12]. In other words, this means 5–15% of MVD patients experience remission.

We studied the 104 consecutive patients of a total series of 2,155 diagnosed between 2001 and 2010, in order to investigate the natural course of untreated HFS over a 5-year period.

Methods

Patients

This study was conducted at the outpatient clinic in a tertiary referral hospital for cross-sectional validation. Institutional Review Board approval was obtained.

All 2,155 patients initially visited between 2001 and 2010, and were diagnosed with HFS after a neurological evaluation according to published criteria. Of these, 205 patients were selected. The inclusion criteria were: (a) primary HFS diagnosed by an experienced neurosurgeon (K.P.), (b) confirmation of vascular compression of the facial nerve on magnetic resonance imaging (MRI), (c) no prior botulinum toxin therapy or surgical treatment since the initial diagnosis. Other facial movement disorders (such as myokymia or blepharospasm) and secondary HFS were excluded as well.

The medical records of the 205 consecutive patients with HFS were reviewed. The data analyzed included demographics and clinical data, i.e., gender, age, age at symptom onset, symptom

Fig. 1. Study enrollment.

duration, symptom severity at first visit, symptom location, compressing vessels, past history, treatment status and symptom course. Spasm severity was divided into 4 groups using the SMC grading system [15].

Symptom course was measured in categories of “aggravated in frequency, duration and intensity,” “stationary,” “improved partially,” and “in remission (little or no spasm)” according to the subjective interpretation of the patients. Patients no longer followed were contacted by telephone. This outcome was determined by recall of the symptom severity by the patient since the onset of the symptoms, not by direct medical examination.

In 113 of the 205 patients, follow-up was achieved, but the other 92 could not be contacted. Nine of these 113 were excluded; 6 died and 3 suffered from other diseases such as dementia and malignancy. This is summarized in Figure 1.

Statistical Analysis

Statistical analysis was performed using SPSS software v18.0. The relationship between symptom course and general and clinical characteristics was analyzed using the χ^2 test and ANOVA analysis.

Results

The mean age of the patients was 62 years (range 34–86 years) at initial diagnosis of HFS. The mean age at onset of HFS was 50 years (range 22–76 years). The mean duration of symptoms was 10.1 years (range 0.2–42.0 years). More clinical characteristics are detailed in Table 1.

The condition was followed for 5–42 years (mean 12 years) from the onset of symptoms. In 11 (10.6%) of the 104 patients, the condition was aggravated for 6–42 years (mean 16 years); 40 (38.5%) were stationary for 6–23 years (mean 12 years). Ten (9.6%) improved partially for 7–18 years (mean 11 years). Forty-three (41.3%) were in

remission for between 2 months and 23 years (mean 6.4 years) after onset and required no further treatment for 5 months to 13 years (mean 5.7 years) (Table 2).

The major reasons that these patients were followed conservatively, despite showing no improvement, were: it was their own choice based on other health conditions, the costs involved, their anxiety and concerns relating to limits and risks, and their adaptation to the symptoms.

Thirty-seven patients continued to receive other treatments such as acupuncture, medication including herbs, and physiotherapy, but not botulinum toxin therapy or MVD. Thirty-eight patients no longer received treatment because they failed to respond adequately, and 29 received no treatment.

There were no significant differences between symptom course and the general and clinical characteristics (Table 3).

Discussion

There has been a general consensus among researchers that most patients need to receive MVD or continue botulinum toxin therapy for a long time because HFS rarely remits spontaneously. However, the natural history of the patients who have not had botulinum toxin therapy or MVD has not been elucidated.

Our study was performed to identify the evidence for guidance for treatment. Furthermore, our data provide a larger sample and longer follow-up of patients with HFS. As previously mentioned, we covered 104 consecutive patients for 5–42 years (mean 12 years) from the onset of symptoms. The results showed that in 51 (49.1%) of these 104 patients, the condition was either aggravated or stationary for 6–42 years (mean 13 years), and 43 (41.3%) patients were in remission for between 2 months and 23 years (mean 6.4 years) after onset, and required no further treatment for 5 months to 13 years (mean 5.7 years).

The follow-up studies by other researchers have been after botulinum toxin therapy [4, 7, 9, 15]; our results are consistent with theirs in supporting the debilitating nature of HFS and the need for treatment among the relatively high proportion of patients for whom HFS lasts. In contrast, our results describe a higher proportion of patients in remission. In the other studies, there were no patients in remission and only 2.3–4.2% experienced symptom relief [4, 7, 9].

In the study by Tunç et al. [14], a greater improvement after botulinum toxin therapy was experienced by patients with idiopathic HFS than by those with neurovas-

Table 1. General characteristics of 104 patients

Sex	
Male	42 (40.4)
Female	62 (59.6)
Age, years	62.3±11.4
Age at onset, years	50.0±11.8
Symptom duration, years	10.1±6.4
Spasm grade at first visit	
I	33 (31.7)
II	50 (48.1)
III	10 (9.6)
IV	11 (10.6)
Symptom location	
Right	51 (49.0)
Left	53 (51.0)
Compressing vessels	
AICA	50 (48.1)
PICA	31 (29.8)
Other (VA or double)	23 (22.1)
Hypertension	
Yes	37 (35.6)
No	67 (64.4)
Diabetes mellitus	
Yes	7 (6.7)
No	97 (93.3)
<i>Treatment</i>	
Acupuncture	
Yes	61 (58.7)
No	43 (41.3)
Herbs	
Yes	39 (37.5)
No	65 (62.5)
Medication	
Yes	39 (37.5)
No	65 (62.5)
Other	
Yes	9 (8.7)
No	95 (91.3)

Values are expressed as *n* (%) or mean ± SD. AICA, anterior inferior cerebellar artery; PICA, posterior inferior cerebellar artery; VA, vertebral artery.

Table 2. Follow-up data on 104 patients

Symptom course	<i>n</i> (%)
Aggravated	11 (10.6)
Stationary	40 (38.5)
Improved partially	10 (9.6)
In remission	
Little spasm	14 (13.4)
No spasm	29 (27.9)

Table 3. Relationship between the symptom course and the general and clinical characteristics in 104 patients

Characteristics	Symptom course				χ^2 or F	p
	no or little	improved partially	stationary	aggravated		
Sex					2.280	0.527
Male	21	3	14	4		
Female	22	7	26	7		
Age ^a at onset	50.1±11.6	53.8±9.5	49.7±12.3	47.5±13.1	0.521	0.669
Spasm grade at first visit					8.177	0.528
I	18	3	10	2		
II	19	4	22	5		
III	3	2	4	1		
IV	3	1	4	3		
Symptom location					0.362	0.948
Right	20	5	21	5		
Left	23	5	19	6		
Compressing vessels					6.862	0.342
AICA	22	4	19	5		
PICA	11	6	10	4		
Other	10	0	11	2		
Hypertension					1.085	0.798
Yes	15	5	13	4		
No	28	5	27	7		
Diabetes mellitus					3.794	0.281
Yes	3	2	2	0		
No	40	8	38	11		
<i>Treatment</i>						
Acupuncture					2.487	0.495
Yes	23	8	23	7		
No	20	2	17	4		
Herbs					2.398	0.519
Yes	15	6	14	4		
No	28	4	26	7		
Medication					1.159	0.780
Yes	16	5	15	3		
No	27	5	25	8		
Other					6.115	0.115
Yes	6	2	1	0		
No	37	8	39	11		

Values denote n of patients, unless otherwise indicated. AICA, anterior inferior cerebellar artery; PICA, posterior inferior cerebellar artery. The exact test was used except for the symptom location.

^a In years, mean ± SD.

cular HFS. To account for this, the authors suggested that the idiopathic form of HFS is associated with biochemical or physiological abnormalities that have greater plasticity than the anatomically apparent lesions that produce neurovascular HFS. Demyelination is seen in HFS, and it is possible that in anatomically apparent HFS, demyelination and also the denervation of the affected muscles are more extensive.

In another study, Burchiel and Slavin [16] proposed a theory that may explain various facial pain syndromes as sequential stages of the same disease process. Typical trigeminal neuralgia may become transformed over time into atypical trigeminal neuralgia, if left untreated. This transformation involves changes in the character of pain and the development of sensory impairment. If one assumes that the development of trigeminal neuralgia is re-

lated to the gradual mechanical compression of the nerve root by the adjacent blood vessel, then the untreated disease would involve a subsequent worsening of the nerve function that should, at least theoretically, present as both negative (progressive sensory dysfunction) and positive (neuropathic pains) phenomena [17].

To sum up the abovementioned theories, HFS is frequently associated with a gradual worsening of the spasm pattern and a shortening of spasm-free intervals. Nevertheless, no previous studies have examined why patients with neurovascular HFS have different outcomes. Even though it is unclear why this happens, our findings suggest that the degree and rate of demyelination and the denervation of the affected muscles are diverse, according to individual characteristics. If this reasoning is correct, further research is required to clarify the contributing factors.

Another issue concerns spasm-free intervals and real improvements in spasm. Our data show that 35 (81.4%) of 43 patients in remission were spasm-free for over 3 years, but this was not clarified. Future trials should explore this evaluation standard.

Limitations of our study are the retrospective nature of our analysis and the use of a patient self-evaluation scale rather than an observer-based rating to determine the symptom course in HFS patients. We included patients

from only 1 hospital and excluded patients who had received botulinum toxin therapy or MVD. The subjects in our study comprised only 5.9% of 1,775 HFS patients who had compressing vessels identified on MRI. Patients who were excluded may have received surgical intervention later because of an aggravation of symptoms; taking this into consideration, the remission rate of 41% of the population would likely be reduced. Most of the subjects chose to not have surgery or botulinum toxin therapy due to other health conditions, the costs involved, their anxiety and concerns relating to the limits and risks involved, and their adaptation to the symptoms despite the severity of the spasms.

Despite these limitations, we recommend that more accurate diagnosis is necessary and that sometimes, especially in the early stage, surgery should be deliberately decided.

Conclusion

All patients with HFS should be offered sufficient disease-related information to allow them to make a well-informed and considered decision. Our study provides useful information for understanding the disease and determining treatment.

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