EVALUATION ON QUALITY OF LIFE IMPROVEMENT IN PATIENTS AFTER MICROVASCULAR DECOMPRESSION TREATMENT OF HEMIFACIAL SPASM

Le Thi Ngoc Lan[1,✉], Duong Dai Ha[1,2], Pham Hoang Anh[1,2]

[1]Hanoi Medical University

[2]Viet Duc University Hospital

Hemifacial spasm (HFS) while not a life-threatening condition, still causes significant facial disfigurement and consequently decreases patient's quality of life (QoL). A retrospective study was conducted at the Neurosurgery Department of Viet Duc University Hospital with 36 patients with HFS who underwent MVD. The clinical data of these patients were collected prospectively and consecutively from June 2023 to June 2024. The validated, questionnaire (EQ-5D-5L, EQ-VAS, PHQ-9, Jankovic Rating Scale) was used to evaluate the QoL in patients with HFS after MVD. Among 36 participants enrolled in this study, there were 6 males and 30 females with a mean age of 49.02 ± 10.03 years old. The mean score of preoperative JRS and postoperative JRS were 3.17 ± 0.38 and 1.44 ± 1.38 respectively. There was a correlation of severity of HFS with patient's QoL in physical and mental domains ($p < 0.05$). There were significant improvements of social life frequency between pre- and postoperative. HFS affects QoL both physically and mentally. Patients with severe HFS symptoms or comorbidities are at higher risk of worse QoL. MVD not only provides high spasm-relief rate, but also leads to significant higher QoL after surgery.

Keywords: Hemifacial spasm, quality of life, microvascular decompression.

I. INTRODUCTION

Hemifacial spasm (HFS) is a neuromuscular movement disorder characterized by involuntary tonic or clonic contractions of the muscles innervated by the facial nerve, usually without any identifiable etiology. The most common cause of HFS is an aberrant blood vessel, which compresses into the root exit zone (REZ) of the nerve.[1]

Hemifacial spasm is chronic neurological disease causing intermittent, unilateral, involuntary contraction. Although not a life-threatening condition, hemifacial spasm (HFS) frequently leads to eye irritation, tearing, difficulty in reading and driving, dysarthria, facial paresthesia, hearing of "clicking" sound, trismus, etc. Such problems cause significant facial disfigurement and consequently affect health-related quality of life (HR-QoL).[2,3] QoL refers to the subjective assessment of an individual's perception and satisfaction of various aspects of life such as physical, psychological, social and somatic domains of functioning.[4] With transformation of medical model and health view, QoL is increasingly distinguish to be an important outcome in many chronic diseases.[5] However, few studies have exclusively evaluated QoL in patients with HFS. Furthermore, depression and anxiety are more prevalent in HFS than in the normal population and symptoms also adversely affect the quality

Corresponding author: Le Thi Ngoc Lan
Hanoi Medical University
Email: lethingoclan28@gmail.com
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of life (QoL).[6]

To date, hemifacial spasm are treated with two main methods: Botulinum toxin (BTX) injection and microvascular decompression (MVD). Botulinum toxin therapy is beneficial in reducing intensity of hemifacial spasm, but has short-term effect and injections need to be repeated many times.[7] It is well known that MVD is an effective and safe treatment for HFS with high spasm relief rate.[8] On the other hand, this method successfully treat 85 - 90% of cases and the prevalence of complications is lower than 1% when performed by experts.[9] MVD treatment has been applied at Viet Duc University Hospital but it has mostly been used in the treatment of primary trigemenial neuralgia. There have been very few studies evaluating this method in the treatment of HFS.

At the Neurosurgery center of Viet Duc University Hospital many HFS cases treated by MVD had achieved high success rate above 80%. However, successful functional improvement after surgery does not necessarily mean that patients have improved QoL; the social function and psychological consequences of HFS patients after MVD has rarely been highlighted in the literature.[10] Therefore, we conducted this research to assess QoL in HFS patient after more than one year MVD treatment.

II. MATERIALS AND METHODS

1. Subjects

Between June 2023 and June 2024, 36 consecutive patients with HFS who underwent MVD treatment at the Neurosurgery Department of Viet Duc University Hospital with a postoperative duration of more than one year from the time of data collection were included in this study.

The inclusion criteria included: (1) The patients were diagnosed with HFS, accompanied with typical clinical symptoms and had MRI at different nerve impulses T1, T2, CISS. (2) Hemifacial spasm Severity Jankovic Rating Scale > 2. (3) Able to understand and answer the questionnaire. Patients with chronic debilitating and life-threatening diseases or other forms of facial movement disorders were excluded.

2. Methods

Study design: A retrospective study.

The severity of HFS was rated on a 0 to 4 scale (0 = no spasm; 1 = minimal, barely noticeable; 2 = mild, without functional impairment; 3 = moderate spasm, functional impairment; 4 = severe, incapacitating spasm), by a movement disorder neurologist. the results of questionnaire were blinded.[11] The EQ-5D-5L, EQ-VAS, PHQ-9 are self-rating health-related quality of life questionnaire in HFS, which has been demonstrated with high validity, reliability and sensitivity.[12,13] The EQ-5D-5L was divided into five domains including mobility, self-care, usual activity, pain/discomfort, anxiety/depression. The answer to each item was based on how the patient felt 2 weeks prior to the date of the test. All participants independently completed the questionnaire after surgery.

Variables and data processing

All data were collected when patients had follow-up visit. Participants were asked by self-reported questionnaire in 20 - 30 minutes including an interviewer-administered structured questionnaire with items on age (years), gender (male, female), educational, marital status, economic status, family support (living alone, living with family, having caregivers) and co-morbidity. Multiple Choice Questions or Yes/No questions taken from some scale assessed the quality of life: EQ-5D-5L, EQ-VAS, PHQ-9. We assessed the severity of HFS according to Severity Jankovic Rating Scale at 2 time point:

before MVD and after MVD with postoperative duration time more than one year.

After collecting data, information was coded and entered to epidata software then analyzed and processed by spss version 22 software. Percentage, number, mean and SD were calculated. Statistical significance was presented with p-value which is less than 0.05.

3. Research ethics

The study was conducted with the verbal consent from patients. Each subject selected for the study was explained in advance about the purpose and asked for their consent to participate. All patient information was kept completely confidential and was used only for research purposes.

III. RESULTS

A total of 36 study subjects comprising 6 male patients (16.7%) and 30 female patients (83.3%) with a mean age of 49.02 ± 10.03 years old (range 29 to 64 years old) were included in this study. The response rate for the questionnaire survey was 100%. The majority of study subjects, approximately 75%, had HFS without other diseases, , while 25% reportedly had HFS with other diseases.

Table 1. Characteristics of participants

	Variables	Patients (n = 36)	Percentage (%)
Gender	Male	6	16.7
	Female	30	83.3
Age group	18 - 29	1	2.8
	30 - 44	13	36.1
	45 - 59	15	41.7
	60+	7	19.4
	Range: 29 - 64 Mean ± SD: 49.02 ± 10.03		
Comorbidity diseases	Yes	9	25
	No	27	75
	Younger group (18 - 59) have other diseases	6	20.7
	Elderly group (60+) have other diseases	3	42.8

The mean stage of severity of HFS preoperative JRS was 3.17 ± 0.38 (range, 1 to 4) and mean stage of postoperative JRS was 1.44 ± 1.38 (range, 1 to 4). After MVD treatment, there were ten patients (27.8%) in moderate JRS and two patients (5.6%) in severe JRS, twenty-four patients (66.6%) had spasm-relief immediately after surgery.

Table 2. Jankovic Rating Severity Scale

	Variables	Patients (n = 36)	Percentage (%)
Preoperative JRS	Moderate	30	83.3
	Severe	6	16.7
Postoperative JRS	None	13	36.1
	Minimal	8	22.2
	Mild	3	8.3
	Moderate	10	27.8
	Severe	2	5.6
Preoperative JRS (Mean ± SD)		3.17 ± 0.38	
Postoperative JRS (Mean ± SD)		1.44 ± 1.38	
p-value*		> 0.05	

Before surgery, with JRS level of 3-4, most patients narrow down social communication and only had extracurricular activity monthly (58.3%). Compared with the level of JRS after surgery, the majority of patients have had social communication weekly (47.2%), followed by 2 - 3 times / week (38.9%).

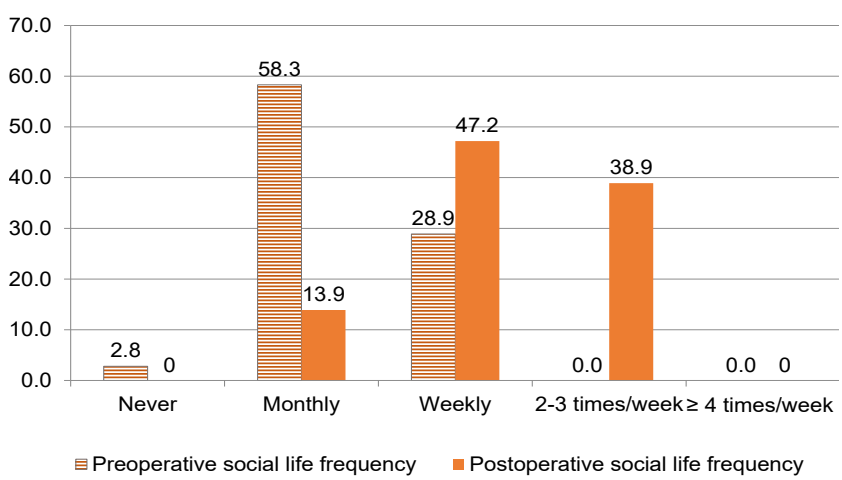

Chart 1. Social life characteristics of participants

Participants who experienced postoperative JRS (0-2) had higher score than those who experienced postoperative JRS (3-4) in EQ-5D-5L utility and EQ-VAS. The difference is significant statistically with $p < 0.05$. In addition, postoperative JRS affected all domains QoL of participants from Mobility, Self-care, Usual Activity, Anxiety/Depression and Pain/Discomfort, the difference is significant statistically with $p < 0.05$.

Table 3. Association between postoperative results and QoL rating on EQ-5D-5L and EQ-VAS

EQ-5D-5L		JRS 0-2 (n = 24)	JRS 3-4 (n = 12)	p-value
Mobility	No problems	21	1	*< 0.05*[a]
	Have problems	3	11	
Self-care	No problems	23	6	*< 0.05*[a]
	Have problems	1	6	
Usual activity	No problems	18	0	*< 0.05*[a]
	Have problems	6	12	
Pain/ Discomfort	No problems	13	0	*< 0.05*[a]
	Have problems	11	12	
Anxiety/ Depression	No problems	15	0	*< 0.05*[a]
	Have problems	9	12	
EQ-5D-5L utility score (Mean ± SD)		0.91 ± 0.12	0.58 ± 0.12	*< 0.05*[a]
EQ-VAS score (Mean ± SD)		83.63 ± 6.25	72.92 ± 3.97	*< 0.05*[a]

Patients those who experienced postoperative JRS (3-4) had mild or moderate severity of depression. The difference is significant statistically with p < 0.05.

Table 4. Association between postoperative results and QoL rating on PHQ9

		JRS 0-2 (n = 24)	**JRS 3-4 (n = 12)**	**p-value**
PHQ9 level	None (n = 21)	21	0	*< 0.05*[b]
	Mild (n = 14)	3	11	
	Moderate (n = 1)	0	1	

Other factors such as age, sex, education level did not correlate with the quality of life.

IV. DISCUSSION

This study was been conducted at the Neurosurgery department of Viet Duc University Hospital. The patients aged from 45 - 59 years old represented the highest percentage (41.7%). The age group from 30 to 44 years old accounted for 36.1% of participants. Mean age of respondent was 49.02 ± 10.03 years old. This result was similar with the study of Tran Hoang Ngoc Anh's study conducted at the Department of Neurosurgery, Nhan Dan Gia Dinh Hospital, Vietnam: the majority of subjects were in the age group 40 to 60 years old (66.6%). Mean age of subjects was 47.9 ± 8.4 years old.[14] Because the pathophysiology of HFS is a functional disorder, the disease is not life-threatening. However, it affects the quality of life and aesthetics. These factors have a great impact on the epidemiological distribution of patients with the majority of patients receiving treatment at working age who need much social

communication. In this study, female patients accounted for 83.3%, and male patients represented 16.7% of total number of subjects. The male/female ratio was 1:5. This distribution was similar to study of Tran Hoang Ngoc Anh, the male/female ratio is approximately 1:4.6.[14] In our study, the ratio of female/male is similar to that study of Tran Hoang Ngoc Anh but much different from foreign study with the rate of female is 4 times higher than male. The reason may be that in Vietnam women are more concerned with aesthetics and social communication than men. On the other hand, the number of patients in our study is too small compared to the foreign study, so it cannot fully represent the epidemiological distribution of the disease.

Severity of HFS rating on Jankovic Rating Scale

Among 36 participants in this study, all patients had preoperative JRS score of 3-4, with 83.3% of patients had a preoperative JRS of 3.This figure is quite similar to the study results of Tran Hoang Ngoc Anh with the percentage of patients had Jankovic score of 3 is 77.8%.[14] It is found that, from JRS score of 3 and higher, patients do not feel confident in social relations and they have a desire to receive surgical treatment.

The moment to decide surgery when the patient feels these spasm affecting life, over time the disease progresses to more severity and becomes persistent. It can spread over all facial muscles and spasm was considered as detrimental symptoms which lead the patient to consider surgical intervention. Based on these criteria we provide preoperative disease selection criteria.

On the other hand, some patients have persistent symptoms with not enough information about treatment methods and believe this condition could be a cerebrovascular accident (CVA) which cannot be treated. The rest also seek medical treatment such as Botulinum toxin injection with relapse symptoms and complications. Even after meeting with medical staff, the patient has not been consulted thoroughly about treatment, so the disease continues to persist until the patient is informed about surgical treatments through the internet.

Consequently, it is necessary to educate the patient as well as to inform medical staff about treatment methods to assist patients' decision making for early treatment. Creation of an informative website on hemifacial spasm is beneficial to medical staff as well as to patients.

In this study, more than two over third population presented with none or mild spasm after surgery (66.7%) with average 2.5 years follow-up. There was 33.3% of patients reported moderate and severe spasm equally with postoperative JRS of 3-4. This figure is similar to study of Sindou, about 80% of patients did not present with spasm or relieved spasm.[15] Therefore, most of patients had good postoperative results with no spasm or mild spasm. However, the rest of the population had to live with sequelae ranging from moderate to severe which was affecting work, life of the patient in the family and community.

QoL of HFS patients after MVD

According to the study of Nguyen Hoang Long and Tran Xuan Bach (2017) on the quality of life of the Vietnamese population in general using the EQ-5D-5L quality of life scale (n = 1571), the utility EQ-5D mean score and the EQ-VAS mean score are 0.91 ± 0.15 and 87.4 ± 14.3 respectively.[16]

In this research, we study on HFS patients after MVD, the utility EQ-5D mean score is 0.79 ± 0.19, the EQ-VAS mean score is 80.06 ± 7.54. As Table 4 shows that patients will have

a good quality of life in terms of physical health, of which 39% patients have difficulty in mobility, 28% patients have difficulty in self-care, 50% patients have difficulty in usual activity. Meanwhile, up to 64% of patients complained about pain or discomfort and 59% of patients felt anxious or depress. This shows that mental health status is a health factor related to quality of life that HFS patients are most affected after MVD surgery.

This is a very remarkable problem in clinical practice, doctors who examine patients after surgery need to take note on the mental health of the patient. For a patient with a problem of severe pain, it is necessary to find the physical causes and select the right treatment. For patients with severe mental health problems, they also need to be examined by a psychiatrist for effective treatment or counseling, thereby providing a better quality of life for the patient.

In the view of clinical and disease-related characteristics, the severity of post-operative JRS is a factor which affects to some domains in EQ-5D-5L and PHQ9.

The degree of postoperative spasm in HFS patient after MVD surgery is related to all aspects of quality of life on the EQ-5D-5L scale including: mobility, self- care, usual activity, anxiety/ depression, pain/ discomfort, which is also related to the EQ-5D utility score and the EQ-VAS score; moreover, it is also related to severe depression on the PHQ9 scale ($p < 0.05$). This is both a driving force and a challenge for physicians specialized in neurological surgery in clinical practice, always trying to make an effort to diagnose early and promptly intervene for patients with HFS.

The greater treatment response and improvement in QOL after MVD in patients with HFS suggest that MVD may be more beneficial to patient's QOL among well-selected patients, for it not only provides high spasm-relief rate, but also leads to significant higher QoL after surgery. MVD is widely accepted and an effective HFS treatment method. More studies need to be done in order to strengthen some factors that greatly contribute to QoL of HFS patients after MVD.

Severity depression of HFS patients after MVD

In this study, we use the PHQ9 scale to assess the depression level of HFS patients after MVD surgery. The majority of patients reported a PHQ-9 score of 0 - 4 equivalent to a non-depression which made up with 58.3%, followed by 38.9% of patients with mild depression and only 1 case of patient with moderate depression with a PHQ-9 score of 11. Patient is a farmer with difficult family economy, postoperative JRS is 4, patient wants to be treated to reduce spams both in severity and frequency. Because of the young age, it interferes with the patient's social communication, the patient always worried about the disease and the ability to cure and the stress which triggers more frequent spasms.

PHQ-9 score lower than 5 suggests minimal depression which may not require treatment. PHQ-9 scores from 5 to 9 suggests mild depression which may require only a watch and wait period and repeated PHQ-9 at follow-up. Functionally, the patient does not report limitations due to their symptoms. Scores of PHQ-9 is from 10 to 14 suggests moderate depression; patients should have a treatment plan ranging from counseling, follow-up, and/ or pharmacotherapy. This farmer patient had suicidal ideation or self-harm, and should be probed further, referred, or transferred for emergency psychiatric evaluation as clinically appropriate and depending on clinician overall risk assessment.

Depression affects between 5% and 10% of

people in medical aid, but is just recognized in around 50% of cases. Depression is related to personal suffering and decrements in quality of life and functioning. Patients with unrecognized depression see their physician more frequently, and consume greater health care resources. The presence of depression in conjunction with physical illness also adversely affects the result of both disorders. Screening and case finding has been proposed to boost recognition and management of depression.[17]

With the importance of psychological state assessments for patients, additionally to employing a domain on the EQ-5D-5L scale, we added the PHQ9 scale with 84% sensitivity and 72% specificity to judge more about severity of depression.[13]

In the study of Young Goo Kim at the Department of Neurosurgery in Korea, Hospital Anxiety Depression Scale (HADS) was utilized to assess the severity of depression and the result showed 13.6% of patients had signs of depression.[2]

The proportion of HFS patients after MVD surgery with sign of depression was not insignificant. Therefore doctors must take note when making surgical decisions for patients. Moreover, the rates rely upon many factors like post-operative results, complications, recurrence rate, follow-up time. Therefore, MVD is widely accepted as an efficient and safe neurosurgical intervention for HFS patients, and a number of other studies have documented the effect of MVD on HR-QoL. Montava et al. reported that MVD is a good and sturdy treatment for HFS, with significant improvements in HR-QoL over a long-term follow-up.[18]

Social relations characteristics

Before surgery, with JRS level of 3 - 4, most patients narrow down social communication and only have extracurricular activity mainly monthly (58.3%), followed by weekly (28.9%). Compared with the level of JRS 2 after surgery, the majority of patients have had social communication weekly (47.2%), followed by 2 - 3 times/week (38.9%).

Besides, there is correlation between post operative entertainment and domains of EQ-5D-5L such as: mobility, pain/discomfort, usual activity, anxiety/depression and PHQ9 ($p < 0.05$).

After MVD, patients with HFS seemed to gain benefits from MVD not only for their facial twitch but also for social anxiety symptoms that may be related to mental health in the quality of life. When evaluating the outcome of MVD in HFS, clinicians should be aware that it is not enough to consider only the improvements in disfigurement and the occurrence of adverse events because these factors do not reflect the impact of HFS on psychosocial aspects. We should continue to aim to improve the surgical outcomes of MVD as well as the social phobia associated with facial spasm and the long-term effects of MVD on psychological aspects and HR-QoL.

Limitation

Firstly, our study was conducted in a limited sample sizes that might not represent for the whole population. Furthermore, the participants attended have more severe symptoms of HFS because they were patients who underwent MVD. Thus, the results might not reflect the condition of all patients with HFS within the general population. Because psychosocial data were collected with a self-administered questionnaire instead of an interview with a psychiatrist, interpretation of the information requires caution. Moreover, this study had a dropout rate of 7.69% (3 patients) because these patients either went aboard or no longer

experienced of HFS therefore did not return for a follow-up visit. In future studies, more reliable data should be obtained through cooperation with the psychiatry department.

V. CONCLUSION

Our study confirms that MVD is a safe and effective treatment for patients with HFS, for it not only provides high spasm-relief rate, but also leads to significant higher QOL after surgery

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