



## Improvement of Quality of Life in Patients with Hemifacial Spasm After Microvascular Decompression: A Prospective Study

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■ **OBJECTIVE:** Although not life threatening, hemifacial spasm (HFS) can be disabling and significantly affect quality of life (QOL). The aim of this study was to assess the major factors affecting the QOL and further to investigate the impact of microvascular decompression (MVD) on QOL in patients with HFS.

■ **METHODS:** Patients with HFS who underwent MVD in our department between 2013 and 2014 were included in this study. The validated, disease-specific questionnaire (HFS-30) was used to evaluate the QOL in patients with HFS before surgery and 1 year after MVD. The clinical data of these patients were collected prospectively and statistically analyzed.

■ **RESULTS:** A total of 116 consecutive patients were enrolled in this study, including 69 women and 47 men, with a mean age of  $43.3 \pm 7.8$  years. The global QOL was significantly impaired in patients with HFS. There was a positive correlation of severity of HFS with patient's QOL both in physical and mental health domains ( $r = 0.34$ ,  $P = 0.02$ ;  $r = 0.46$ ,  $P = 0.03$ ). Patients with a higher educational level tended to have a worse QOL in the mental health domain ( $r = 0.43$ ,  $P = 0.02$ ). Seventy-nine patients (68.1%) were spasm free immediately postoperatively, 106 (91.4%) were spasm free at 1-year follow-up. There were significant improvements across all subscales of the HFS-30 questionnaire between preoperative and postoperative responses, and 84.5% of patients experienced significant improvement in QOL after MVD.

■ **CONCLUSIONS:** HFS affects QOL both physically and mentally. Patients with severe HFS symptoms or a higher

educational level are at higher risk of worse QOL. MVD not only provides high spasm-relief rate but also leads to significantly higher QOL after surgery.

### INTRODUCTION

Hemifacial spasm (HFS) is a movement disorder manifested by involuntary, intermittent, tonic, and clonic contraction of the facial muscles.<sup>1</sup> Neurovascular compression of the root exit zone of the facial nerve has been generally accepted as the most common underlying cause.<sup>1-3</sup> Microvascular decompression (MVD) leads to neurovascular conflict elimination and successful spasm relief, strongly supporting this theory, which is widely used in treating HFS.<sup>3-6</sup>

Although HFS is a chronic and non-life-threatening condition, patients with chronic facial disfigurement often experience serious visual and verbal disability, social embarrassment, and significant distress in social interaction, which may seriously affect quality of life (QOL) in these patients.<sup>7,8</sup> QOL refers to the subjective assessment of an individual's perception and satisfaction of various aspects of life across the psychological, physical, social, and somatic domains of functioning and well-being.<sup>7</sup> With the transitions of the health view and medical model, QOL is increasingly recognized to be an important outcome measure in many chronic diseases.<sup>9,10</sup> However, few studies have exclusively evaluated QOL in patients with HFS. Furthermore, the generic QOL scales may not capture the full impact of HFS, because patients with HFS often have emotional and related mental problems rather than physical disability. In a previous study, Tan et al. validated a disease-specific questionnaire directly for patients with

#### Key words

- Hemifacial spasm
- Microvascular decompression
- Quality of life

#### Abbreviations and Acronyms

- BtA:** Botulinum toxin A  
**HFS:** Hemifacial spasm  
**HFS-30:** 30-Item Hemifacial Spasm Questionnaire  
**MVD:** Microvascular decompression  
**QOL:** Quality of life  
**SI:** Summary index

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HFS by using the 30-item Hemifacial Spasm Questionnaire (HFS-30), which included physical and mental health domains.<sup>7</sup>

MVD is an effective and safe treatment for HFS, with a high long-term spasm relief rate.<sup>3,4</sup> However, successful functional improvement after surgery does not necessarily mean that patients have improved QOL; the social functioning and psychological consequences of patients with HFS after MVD have rarely been highlighted in the literature. In the present study, we used a validated, disease-specific scale (HFS-30) to evaluate the QOL in patients with HFS and to assess the major factors affecting QOL and further to investigate the impact of MVD on QOL.

## METHODS

### Patient Population

Between September 2013 and October 2014, a cohort of 116 consecutive patients with HFS who underwent surgical treatment at the Neurosurgery Department of West China Hospital were included in this study. The inclusion criteria included 1) a clinical diagnosis of primary HFS using standard criteria,<sup>1</sup> 2) able to understand and answer the questionnaire, 3) accepted for MVD treatment. Patients with chronic debilitating and life-threatening diseases or other forms of facial movement disorders were excluded. This study was approved by the West China Hospital ethics committee and all patients gave their written informed consent to participate.

### QOL Evaluation

The HFS-30 is a self-rating health-related QOL questionnaire in HFS, which has been shown by Tan et al.<sup>7</sup> to have high validity, reliability, and sensitivity. The HFS-30 was divided into 7 domains with a total of 30 items, including mobility (5 items), activities of daily living (ADL) (5 items), emotional well-being (7 items), stigma (4 items), social support (3 items), cognition (3 items), and communication (3 items). Each of the 30 items was scored on a 5-point scale ranging from 0 (never) to 4 (always). Lower scores are associated with a higher QOL. The answer to each item was based on how the patient felt 2–3 weeks before the date of the test. All participants independently completed the HFS-30 before treatment, and they were also asked to assess their response to MVD based on a similar questionnaire 1 year after surgery.

### Assessment of Severity of HFS

The severity of HFS was rated on a 0–4 scale (0 = no spasm; 1 = mild, barely noticeable; 2 = mild, without functional impairment; 3 = moderate spasm, moderate functional impairment; and 4 = severe, incapacitating spasm),<sup>11</sup> by a movement disorder neurologist blinded to the results of questionnaire.

### Operative Procedure and Follow-Up

Patients were operated on by MVD via a standard suboccipital retrosigmoid approach, which was described in detail in our previous study.<sup>12</sup> All patients were followed up at the outpatient department or by telephone. Detailed clinical outcome assessment was performed immediately after surgery and at 6-month to 12-month follow-up intervals. The surgical outcome of HFS was categorized as success (spasm free) or failure

(persistent spasm). Operative complications were also recorded immediately after surgery and at follow-up.

### Statistical Analysis

For each subscale, a summary index (SI) ranging from 0 to 100 was created because each subscale had varying number of items. The SI was calculated as follows: 
$$\frac{\text{Sum of scores for each item}}{\text{The maximum score per item} \times \text{number of items}} \times 100.$$
 The HFS-30 questionnaire was broadly divided into physical health and mental health. The physical health domains of HFS-30 were mobility and activities of daily living. The mental health domains were emotional well-being, stigma, social support, cognition, and communication.

SPSS software was used for statistical analyses (version 24.0 [IBM Corp., Armonk, New York, USA]). The mean was expressed  $\pm$  standard deviation throughout. Descriptive statistics were used to summarize patient characteristics. The SI scores before and after MVD were compared using a Student *t* test. Pearson or Spearman rank correlation coefficient was used to analyze the correlation between various factors and the scores of questionnaire. Associations were considered statistically significant when  $P < 0.05$ .

## RESULTS

A total of 116 study patients comprising 69 women (59.5%) and 47 men (40.5%) with a mean age of  $43.3 \pm 7.8$  years (range, 21–64 years) were included in this study. The response rate for the questionnaire survey was 100%. The left side was affected in 66 patients (56.9%) and the right in 50 patients (43.1%). The mean HFS duration before surgery was  $45.3 \pm 29.2$  months (range, 10–180 months). The mean stage of severity of HFS was  $2.8 \pm 0.7$  (range, 1–4) (Table 1).

Seventy-nine patients (68.1%) were spasm free immediately after surgery, and 106 (91.4%) were spasm free at 1-year follow-up. Complication rates were 9.5% immediately after the operation, including facial weakness in 4 patients, tinnitus in 3, hearing loss in 2, and cerebrospinal fluid leak in 2. Most complications were reversible and only 3.4% of patients experienced varying degrees of complication at 1-year follow-up.

The standardized SI of each subscale in HFS-30 is listed in Table 2. The domains of stigma and emotional well-being had the highest values of  $34.7 \pm 24.0$  and  $31.3 \pm 20.3$ , respectively, and communication had the lowest value of  $17.0 \pm 23.4$ . After 1 year of follow-up, improvements in QOL were observed in all the subscales of HFS-30 in this series (Figure 1). The maximum improvement was the subscale of stigma, which improved from mean scores of  $34.7 \pm 24.0$  to  $11.1 \pm 8.3$  (Table 2). In terms of the mean SI of each subscale, 84.5% of patients with HFS experienced improved QOL after MVD.

Both physical health domains and mental health domains scores were found to be positively correlated with the severity of HFS ( $r = 0.34$ ,  $P = 0.02$ ;  $r = 0.46$ ,  $P = 0.03$ ). In addition, the analysis showed that there was a positive correlation of educational levels with the mental health domains scores ( $r = 0.43$ ,  $P = 0.02$ ). However, no correlations were found between educational levels and physical health domains scores ( $r = 0.24$ ,  $P = 0.32$ ). Further analysis of the postoperative scores showed that

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