

# Abnormal Muscle Response Monitoring by a New Method in Patients with Hemifacial Spasm : A Prospective Study

Seunghoon Lee MD; Sang-Ku Park; Juyoung Hwang; Jeong-A Lee; Byung-Euk Joo; Doo-Sik Kong MD; Dae-Won Seo; Kwan Park MD

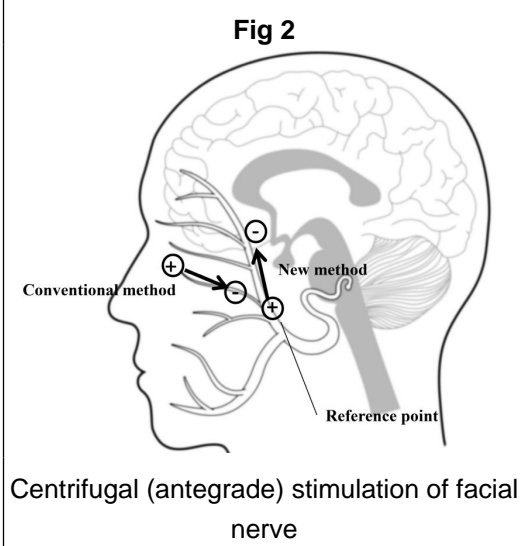
Department of Neurology & Neurosurgery, Samsung Medical Center, Sungkyunkwan University School of Medicine

## Introduction

Intraoperative abnormal muscle response (AMR) has been a reliable diagnostic tool and an indicator of complete decompression of facial nerve from offending vessels in hemifacial spasm (HFS) patients. To the best of our knowledge, there have been no attempt to apply different methods of AMR monitoring to increase the efficacy.

## Methods

The study included 486 consecutive HFS patients prospectively who were performed with AMR monitoring by a new method during MVD. A new method comprised of preoperative facial nerve mapping and intraoperative AMR monitoring with antegrade stimulation of facial nerve. With the last 62 patients, we performed a comparison study in which patients were monitored AMR with both antegrade and retrograde stimulations at the same time.



## Results

Preoperative facial nerve mapping showed "F" was the location where maximal AMR was detected most frequently (66.9%). Intraoperative AMR was observed in 419 (86.2%) of 486 patients by a new method and it was disappeared after MVD in 404 (96.4%) of 419 patients. Comparison of AMR monitoring by antegrade and retrograde method showed that disappeared AMR after MVD was observed in 98.2% and 61.8%, and no AMR in 0% and 9.1%, respectively. Persistent AMR despite the thorough exploration and decompression was observed in 1.8% and 29.1%.

	N (%)
Preoperative positive AMR	428 (88.1)
Location of maximal AMR	
F	325 (66.9)
F-O	91 (18.7)
O	12 (2.5)
Intraoperative AMR positive	419 (86.2)
Post-decomp. disappeared	404 (96.4)
Post-decomp. persistent	15 (3.6)

Preoperative mapping and AMR monitoring by antegrade stimulation of facial nerve

	Previous	New	p Value
AMR disappeared	34 (61.8)	54 (98.2)	0.0012
disappeared before decomp.	12	14	
disappeared imm. after decomp.	19	37	
disappeared long after decomp.	3	3	
AMR persistent	16 (29.1)	1 (1.8)	0.0051
no change	3	1	
reappeared after disappearance	5	0	
persistent but with decreased amplitude	8	0	
No AMR	5 (9.1)	0 (0)	<0.0001

Comparison of intraoperative AMR monitoring by previous and new methods

## Conclusions

A new method of preoperative mapping with intraoperative antegrade stimulation of facial nerve showed better efficacy in AMR monitoring, and it confirms that the disappearance of AMR is still a good indicator of complete decompression during MVD surgery.

## Learning Objectives

A new method guaranteed better efficacy in AMR monitoring during MVD surgery.

## References

- Nielsen VK. Pathophysiology of hemifacial spasm: I. Ephaptic transmission and ectopic excitation. *Neurology* 1984;34:418-426.
  - Moller AR, Jannetta PJ. Hemifacial spasm: results of electrophysiologic recording during microvascular decompression operations. *Neurology* 1985;35:969-974.
  - Jannetta PJ, Abbasy M, Maroon JC, Ramos FM, Albin MS. Etiology and definitive microsurgical treatment of hemifacial spasm. Operative techniques and results in 47 patients. *J Neurosurg* 1977;47:321-328.
  - Wei Y, Yang W, Zhao W, et al. Microvascular decompression for hemifacial spasm: can intraoperative lateral spread response monitoring improve surgical efficacy? *J Neurosurg* 2017;1-6.
  - Moller AR, Jannetta PJ. Monitoring facial EMG responses during microvascular decompression operations for hemifacial spasm. *J Neurosurg* 1987;66:681-685.
  - Wilkinson MF, Kaufmann AM. Monitoring of facial muscle motor evoked potentials during microvascular decompression for hemifacial spasm: evidence of changes in motor neuron excitability. *J Neurosurg* 2005;103:64-69.
- (The rest is omitted.)

