SELECTIVE PARTIAL NEURECTOMY IN HEMIFACIAL SPASM AND THE ELECTROPHYSIOLOGIC SELECTION OF PATIENTS*

WILLIAM A. NOSIK, M.D.,† AND ANDRE A. WEIL, M.D.‡

Cleveland, Ohio

(Received for publication May 11, 1956)

We are concerned here with the existence of hemifacial spasm as an apparent neurological or psychoneurological disturbance characterized by paroxysmal twitching of all, or part, of the musculature of the face. A review of the extensive literature on this subject has been presented by the authors18 in another publication, and reveals a wide divergence of opinion regarding the etiology, classification, and treatment of the facial dyskinesias. Considering these discrepancies it seems strange that clinicians have not made more effective use of the aid proffered by electrophysiologic technics.

This discussion deals briefly with the assistance gained by the use of such technics and their practical applications.

Utilizing combined clinical and electrophysiologic observation, the hemifacial spasm occurring as an isolated neurological or psychoneurological entity can be classified as follows: (a) Spasm caused by cortical irritation. (b) Spasm resulting from involvement of the facial nucleus itself. (c) Spasm representing a psychogenic conversion reaction (habit spasm).

Hemifacial spasms occurring as an accessory symptom in a variety of neurological disorders (purulent meningitis, trigeminal neuralgia and tetanus,3 encephalitis,12,13 aneurysms of the basilar artery,4 cerebellopontine tumors,6 and following irritation of mes- and diencephalic areas in animals15) are not a topic of this discussion.

Hemifacial spasms caused by cortical irritation are somewhat uncommon since additional neurologic signs and symptoms resulting from involvement of adjacent cortical areas are usually present. In these cases actual disturbance of the cerebral neuronal rhythmicity is noted in electroencephalographic studies.

The cases of prime interest to the neurological surgeon, however, are those in which the spasms are caused by involvement of the facial nucleus itself, which Wartenberg17 and others8 believe to be the site of lesion in this condition. Wartenberg classifies hemifacial spasm caused by nuclear firing as (1) cryptogenic facial spasm resulting from infectious or degenerative changes, or from an inferior Anlage; (2) réaction à distance in lesions of the peripheral branches of the facial nerve; and (3) postparalytic facial spasm following

* Presented before the Harvey Cushing Society, Honolulu, Hawaii, April 17, 1956.
† 10315 Carnegie Avenue, Cleveland 6, Ohio.
‡ 1020 Huron Road, Cleveland 15, Ohio.
Bell’s palsy. It is this type of hemifacial spasm, i.e., caused by nuclear firing, which can, and necessarily must, be differentiated from the psychogenic variety of habit spasm if neurosurgical measures are to be considered.

Unlike Thiébaut et al. we have been unable to differentiate these various subtypes of firing electrophysiologically. It seems that there may be a common electrophysiological basis for the hemifacial spasm caused by nuclear firing. While these three subclassifications show no definite electroencephalographic disturbance of cerebral rhythmicity, all show an electromyographic

---

![Diagram: EEG and EMG](image)

**A) EEG and EMG (Cup-Electodes) (Ink-Writer)**

**B) EMG (Coaxial Needles)**

**Fig. 1.** Hemifacial spasm caused by “nuclear firing.” Maximal mono- and biphasic spike bursts over left zygomatic muscle (in spite of clinical accentuation of spasms over left orbicularis oculi muscle). (A) Utilizing cup electrodes. (B) Utilizing coaxial needles (see text).