Campotomy in Myoclonia*

H. T. WYCIS, M.D., AND E. A. SPIEGEL, M.D.
Department of Neurosurgery, and the Cerebral Stereotaxic Institute,
Temple University Medical Center, Philadelphia, Pennsylvania

The involuntary, brief, rapid, rather irregular jerks called myoclonic are found in a great variety of conditions; as far back as 1903 several hundred cases had been summarized. However, little has been described as to treatment for this condition. Hassler, et al., abolished the jerky movements by coagulation of the thalamic endings of the brachium conjunctivum. We reported the beneficial effect of lesions of Forel's field H (campotomy), and Laitinen carried out subventrolateral thalamotomy (at 15.5 mm posterior to the anterior commissure and 11.5 mm lateral to the midline) in patients with severe progressive myoclonus epilepsy. Favorable effects on contralateral ataxia, intention tremor, and gait were observed, and for several months the frequency of the grand mal seizures was also reduced while the effect on the myoclonia was less marked.

Because all these communications covered only short-term observation periods, it may be appropriate to report here the long-range effects of campotomy. Since our previous publication we have had the opportunity to observe that case for 6 years after unilateral and 4 years after bilateral operation. We have also treated two additional cases surgically; one of these has been observed for 4 years and the other for half a year after a unilateral lesion of Forel's field.

None of the cases disclosed a familial background or history of encephalitis; however, the first case had meningitis at the age of 6 years. All three patients were males, the ages being 19, 25, and 30 years respectively. The abnormal jerky movements involved primarily the neck, shoulder, and upper limb musculature. Involuntary grunting or “woofing” noises were heard in the first two cases and usually occurred synchronously with myoclonic movements of the neck, upper limbs, and diaphragm. Palatal myoclonus was not a feature of the disease in any of the cases. All these involuntary movements increased with excitement and decreased with sleep. The EEG did not reveal dysrhythmia in any of the tracings. Electromyograms indicated a marked postoperative reduction in the myoclonic jerks. No neurological complication was noted after surgery, and all these patients are presently gainfully employed.

The technique of campotomy and the coordinates have been described previously. In brief, after visualization of the 3rd ventricle with Pantopaque, the sheath of the electrode is introduced perpendicular to the intercommissural line, 11 mm anterior to the posterior commissure for a length of the intercommissural line of 25–27 mm. For a shorter intercommissural distance (23–24 mm) the lesion is placed 10 mm anterior, and for a longer intercommissural distance (28–29 mm) 12 mm in front of the posterior commissure. The puncture canal reaches the level of the intercommissural line 6–7 mm lateral to the median plane. It should also be mentioned that ocu-lomotor disturbances have no longer been observed since the puncture has been performed more anteriorly, namely, at a point corresponding to the midpoint of the intercommissural line. It has proved important to repeat roentgenograms after the electrodes have been inserted into the brain in order to check their position in relation to the intercommissural line so that corrections in their depth can be made, if necessary. Care must be taken to avoid the corpus subthalamicum in view of the danger of producing hemibalistic movements.

Case Reports

Case 1. A 19-year-old white man was admitted to Temple University Hospital on
April 23, 1962, because of grunting and jerking of the neck muscles of 8 years' progression. When 6 years old he had recovered from an attack of "spinal meningitis."

**Examination.** The involuntary grunting noises were associated with myoclonic movements affecting primarily the neck, left shoulder and arm, and diaphragm. Myoclonic jerks of the abdominal muscles on the left side appeared synchronously with the abnormal vocalization. The movements of the larynx were recorded at 54–56 per minute, while movements of the diaphragm ranged from 50–52 per minute. The movements ceased during sleep and were less pronounced when he was relaxed. When the movements were severe, the head would be jerked backward by the posterior cervical muscles. The objective neurological findings otherwise were normal.

**Operation.** On September 27, 1962, a right campotomy was performed under local anesthesia.

**Postoperative course.** Following the operation, there was a marked reduction in the abnormal movements described above. The head was held normally, without jerking, and there was a decrease in the intensity and frequency of the myoclonic movements of the left shoulder and arm (Fig. 1). The disturbing loud grunting noises subsided almost completely. He returned to his former occupation as a leather worker and was gainfully employed until January, 1964, when jerking movements appeared on the right side involving particularly the neck and shoulder muscles. The left side was still tranquil. The EMG's (Fig. 2) likewise showed irregular rhythmic contractions of the neck and shoulder musculature on the right side. The left side was normal.

The onset of right-sided movements started 4 months prior to readmission to the hospital and began gradually with a twitching of the muscles of the right shoulder girdle and the muscles of the right side of the neck, particularly the platysma. The grunting noises returned; at first they were faint, but they became progressively louder so that they annoyed others near him. Nevertheless, he continued to work. He sought admission to have the campotomy performed on the opposite side.

**Second examination.** With the exception of the grunting noises and the myoclonia involving the platysma muscle on the right side and the muscles of the right arm and shoulder girdle, the neurological examination was essentially negative. The speech did not appear to be altered, but periodically the patient would emit a loud grunting noise or a noise similar to a "bark." These noises would occur at irregular intervals, without warning; the abdominal muscles and the body jerked at the time the noise was emitted. No pathological reflexes were elicited, and the deep tendon reflexes were normal throughout. There was no evidence of any weakness or paralysis on either side. Perception of pain, temperature, and light touch was normal. The coordination tests failed to reveal cerebellar dysfunction or ataxia, and the gait and station were normal.