

## REPORTS OF SCIENTIFIC MEETINGS

*Richard I. Mazze, M.D., Editor*

### Society of Neurosurgical Anesthesia and Neurologic Supportive Care

The ninth annual meeting, held in New Orleans on October 16, 1981, began with a symposium on malignant supratentorial brain tumors. R. Bedford (Charlottesville) spoke on the use of perioperative intracranial pressure (ICP) monitoring for supratentorial brain tumor excision, indicating that use of such monitors allows treatment of ICP increases to be matched exactly to the patient's needs rather than given on an empirical basis. He also pointed out the relatively low risk of ICP monitoring and that patients usually tolerate the preoperative insertion of these instruments with local anesthesia. Use of an ICP monitor has permitted detection of otherwise unsuspected intracranial hypertension following noxious stimuli such as endotracheal intubation or application of a pin head holder, neck flexion while positioning the patient, and the administration of volatile agents after induction of anesthesia even after establishing hyperventilation. Intraoperative ICP monitoring can also facilitate the administration of diuretics and other drugs used to lower ICP intraoperatively. M. Salcman (Baltimore) spoke on the therapeutic implications of multifactorial treatment of glioblastoma multiforme. He addressed the theoretical advantages of treating glioblastomas repetitively with combination therapy including surgery, chemotherapy, radiation therapy, and hyperthermia, and presented some preliminary results using implantable microelectrode microwave generators in humans. M. S. Mahaley, Jr., (Chapel Hill) spoke on the future prospects of therapy for malignant brain tumors. Among the modalities mentioned were: surgery, with more complete tumor removal using the CT scanner and stereotactic methods for tumor localization; radiation therapy with differentiation and fractionation of the radiation dose; radiosensitizers to improve radiation therapy therapeutic ratios; new anti-tumor drugs; drugs that alter the blood-brain barrier, thus, increasing the concentration of anti-tumor drugs in malignant tissue; immunotherapy; diet therapy; and hyperthermia.

A special lecture was given by Louis Sokoloff, M.D., Chief, Laboratory of Cerebral Metabolism, National Institute of Mental Health entitled, "Localization of Functional Activity by Measurement of Local Glucose Utilization in the Central Nervous System." The author described his work using radioactive deoxyglucose as a tracer for glucose utilization in the brain. Using this method he has successfully mapped areas of functional activity in the brain. He also traced the adaptation of this method for use in humans with positron-emission tomography using positron-emitting analogues of deoxyglucose. This may allow the clinical mapping of sensory-motor pathways and their cortical projections, and may be useful in diagnosing and localizing central nervous system lesions.

At the symposium on evoked responses, C. W. Erwin (Durham) spoke on the technical aspects of instrumentation used

in obtaining evoked cortical potentials. Analogue processing, such as, common mode rejection, amplification, use of filters, and the averaging process itself, were described. R. Greenberg (Richmond) spoke on the use of multimodality-evoked potential recordings for monitoring patients in the intensive care unit with severe head injuries. He stated that multimodality-evoked potentials were the single most reliable prognostic indicator, predicting with 91 per cent accuracy the outcome of severe head injury. B. Grundy (Pittsburgh) addressed the use of evoked responses in the operating room. She noted that brain stem auditory-evoked responses are used to monitor eighth nerve function during posterior fossa surgery, somatosensory-evoked potentials are used to monitor spinal cord function during Harrington Rod and spinal cord surgery, and visual-evoked responses are used to monitor the visual pathways during transphenoidal hypophsectomy. She believes that the major factor limiting the use of evoked responses in the operating room is the meticulous quality control that is needed in acquiring, processing, and interpreting evoked potentials.

R. A. E. Bakay (Seattle) presented the prize-winning paper in the Resident-Fellow Research Contest entitled, "Enzymatic Changes in Serum and Cerebrospinal Fluid in Neurological Injury." Determinations of CPK and its isoenzymes, LDH and its isoenzymes, and SGPT were performed in the serum and CSF of patients with closed head injuries (Glasgow Coma Scale 3 to 15). Among serum enzyme determinations in 139 patients, only CPK 1 isoenzyme levels correlated with the degree of head injury. However, in fifty-seven patients who had CSF enzymatic determinations, levels of each of the enzymes correlated directly with both Glasgow Coma Scale and with ultimate neurologic outcome. In severe head injury (Glasgow Coma Scale, 3 to 7), CPK 1 and LDH 1 isoenzymes in CSF showed the best correlation, both with the degree of head trauma and with outcome. In addition to head trauma, secondary injuries such as delayed hemorrhage, infarction, hypoxia, or pathologic elevations in intracranial pressure also were detected readily by CPK 1 isoenzymes in the CSF. Dr. Bakay concluded that CPK 1 isoenzyme in the CSF appears to be a specific marker for neurologic trauma and may be of value in evaluating neurologic injury.

At the scientific papers session, P. Raudzens (Phoenix) presented the results of investigations in which brain stem auditory-evoked potentials were recorded during neurosurgical operations. The data showed a good correlation between loss of brain stem auditory evoked potentials and postoperative hearing loss. Thirteen per cent of the patients developed latency delays in the brain stem auditory evoked response which alerted the surgeon to a potential hearing deficit postoperatively. The use of brain stem auditory-evoked potentials during surgery in and

around the posterior fossa or brain stem was recommended as a useful technique for monitoring eighth nerve function. E. M. Nemoto (Pittsburgh) examined brain free fatty acid liberation as a model for screening potential therapies for global brain ischemia. The agents studied were pentobarbital, thiopental, phenytoin, etomidate, Y-9179, Innovar, and Ketamine. Thiopental was found to be the most effective drug in preventing increases in brain free fatty acid secondary to global ischemia. G. Tyson (Glasgow) reported that halothane-induced hypotension increased blood-brain barrier permeability following focal cerebral ischemia. He indicated that changes in mean arterial pressure may have a direct influence on blood-brain barrier function following ischemic injury to the brain.

In other free papers, R. Bedford (Charlottesville) correlated abnormalities of the preoperative CT scan in patients with brain tumors with episodes of increased ICP during induction and maintenance of anesthesia. Changes which correlated well with the need for intracranial pressure monitoring were tumors greater than 3 cm in diameter with significant peritumor edema, midline shift greater than 5 mm, and any degree of ventricular effacement. R. Cucchiara (Rochester, MN) reported that the incidence of air embolism in 32 children undergoing suboccipital craniotomy was 34 per cent. In only 10 per cent of these could

air be aspirated from the central catheters while 65 per cent of the children exhibited hypotension. He concluded that a central venous catheter may not be as helpful in children as in adult patients undergoing operations in the seated position. R. C. Shupak (Philadelphia) described the use of high-dose fentanyl and oxygen as a means of inducing reversible narcotic coma for neurosurgical procedures in the seated position, where nitrous oxide could aggravate the cardiovascular and neurologic consequences of venous air embolism. As compared to control patients who received N<sub>2</sub>O-O<sub>2</sub>-narcotic-potent agent anesthetics, the fentanyl-O<sub>2</sub> group seemed to exhibit less lability of the mean arterial pressure during anesthesia and surgery.

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