SIX YEARS' EXPERIENCE WITH COMBINATION CHEMOTHERAPY FOR MALIGNANT TUMOURS OF THE NEURO-AXIS

WOLFF KIRSCH (Denver) described the treatment of glioblastoma multiforme with Warfarin, and showed a film of tissue cultures.

TRAUMA TRIGGERED MIGRAINE AND JUVENILE HEAD TRAUMA SYNDROMES

DAVID HAAS, GERGORIO S. PINEDA, and HERBERT LOURIE (Syracuse) described the clinical spectrum of trauma triggered migraine derived from an analysis of 50 attacks in 25 patients. The attacks were placed in four clinical types: (1) hemiparesis, (2) somnolence, irritability, and vomiting, (3) blindness, (4) brain-stem signs.

All attacks followed mild head trauma after a latent interval lasting generally between one and 10 minutes. Forty of the 50 attacks occurred in patients under 14 years of age. Full recovery occurred after a variable time in all but one case. This patient and one other had angiographically demonstrable occlusion of a branch of a middle cerebral artery. In its clinical and laboratory features trauma triggered migraine is similar to spontaneous migraine. It is a common phenomenon after head trauma in children.

SURGERY OF CRANIOFACIAL DEFORMITIES

J. A. JANE (Charlottesville) noted that until about 10 years ago the outlook for rehabilitation of a child with major craniofacial deformity involving malposition of the eyes and significant asymmetry of facial and cranial bones was dismal. Although multiple attempts were often made by plastic surgeons to improve the symmetry of the features, the malposition of the skeleton, especially in the orbital region, made the final result disappointing to the patients' families and surgeons. In the field of neurosurgery attention had been directed towards prematurely fused suture lines, and efforts had been made to provide room for brain enlargement. Serious secondary deformities of the skull and face had been seen in many children during the years of growth after apparently successful maintenance of brain function. With further experience there had been a tendency towards operating at a progressively earlier age. The advantages of earlier treatment of these anomalies were the avoidance of psychological trauma to patients and parents and the possibility of more normal growth and the achievement of functions such as binocular fusion. In a series of over 20 cases operated on under the age of 6 years there had been one operative death. The patients included examples of Crouzon's disease, encephaloceles, and complex craniofacial anomalies.

DISSECTING ANEURYSMS OF THE INTERNAL CAROTID ARTERY

J. W. CORRELL, E. H. WOOD, and M. B. CAMINS (New York) described two patients with dissecting aneurysms of the internal carotid artery. In both there had been repeated episodes of cerebral embolism. The arteriographic findings in the two cases were markedly dissimilar. Both patients had been treated surgically and both recovered. One had a resection of the lesion followed by end to end anastomosis of the internal carotid artery, and the other underwent ligation of the internal carotid artery to prevent further embolism.

SURGICAL REPAIR OF HIGH CERVICAL CAROTID ARTERY ANEURYSMS

H. MORGAN and J. T. ROBERTSON (Memphis) drew attention to the difficulty of treating high cervical carotid artery aneurysms just below the base of the skull. They reviewed three cases demonstrating such lesions and detailed their surgical approach. The first case was a false aneurysm of the internal carotid artery after a gun shot wound at a level between the atlas and axis. In the second case a dissecting aneurysm of the internal carotid artery extending from the carotid bifurcation to the base of the skull was repaired. In the third patient a large aneurysmal formation of the distal part of the internal maxillary artery, together with an associated arteriovenous fistula, were resected. With careful sharp dissection access to the base of the skull could safely be gained anterolaterally above the styloid process. Mobilization of the superficial part of the parotid gland was required and care must be exercised to avoid injuring the neighbouring cranial nerves.

MATHEMATICAL MODEL OF CEREBROSPINAL FLUID DYNAMICS

A. TALALLA and R. BLOCK (Hamilton) described a three chamber model of the dynamics of CSF flow. Secretion and absorption of CSF, flow resistance, vascular pulsations, and viscoelastic properties of a spherical shell brain were among the parameters considered. Conditions were shown to exist where, without interruption of flow, hydrocephalus develops.

CHRONIC MEASUREMENT OF EPIDURAL PRESSURE WITH AN INDUCTION POWERED OSCILLATOR TRANSDUCER

H. GRADY RYLANDER, H. LYNDON TAYLOR, JOHN P. WISSINGER, and JIM L. STORY (San Antonio) had designed an induction powered oscillator transducer for the chronic measurement of epidural pressure. The IPOT combined the durability and long life of the passive resonant circuit type transducers with the sensitivity and telemetry capabilities of battery

powered devices. The IPOT was completely implantable so that no tubes or wires were required to penetrate the skin. It had a sensitivity of 2 mm water, and zero drift, which had been a substantial problem with most other transducers, had been eliminated by hermetic sealing of the transducing element. Evaluation of the IPOT was carried out by implantation in 11 dogs, and both epidural and ventricular pressures were measured simultaneously varying from hours to 12 weeks. The optimal parameters for insertion were determined. Epidural pressure was found to be a linear function of intraventricular pressure with a correlation of 0.998 in both acute and chronic implants. Epidural pressure was found to be higher than intraventricular pressure in the chronic implants because of fibrosis of the dura mater beneath the transducer. The dural stress force thus produced created a fictitiously high epidural pressure. Dural fibrosis not only caused absolute pressure differences but also decreased the measured epidural pressure response to changes in intraventricular pressure due to stiffness of the transducing membrane. An accurate correlation of epidural pressure with intraventricular pressure in chronic implants would depend on the use of special materials to minimize dural fibrosis. Despite the problems created by dural fibrosis, the IPOT performed well and provided reliable and sensitive measurements of epidural pressure in chronic implants.

TRAUMATIC EXTERNAL HYDROCEPHALUS

WALPOLE LEWIN (Cambridge) read a paper on external hydrocephalus after trauma.

BENIGN INTRACRANIAL HYPERTENSION: RESULTS OF TREATMENT BY DEHYDRATING AGENTS

A. A. JEFFERSON (Sheffield) had treated 26 patients with papilloedema but no intracranial tumour during the past 18 years. Twenty-one of these were treated by non-surgical means, and all were female and overweight. Although most of the patients were aged less than 26 years, older patients were also affected by this disease. A sequence of dehydrating agents had been used over the years. These were: oral urea 1.0 g/kg/d, oral glycerol 1.0–1.5 g/kg/d, hydroflumethiazide 100 mg every other day, chlorthalidone 200 mg every other day.

With the newer diuretics potassium supplements had been prescribed. While on dehydration therapy the patient's total daily fluid intake had been limited to 900 ml. The patients had also been encouraged to lose weight. The success of the therapy had been controlled by serial measurements of the blind spot, and these had been obtained on a Bjerrum screen at 2 m using a 16 mm white object. Eight points had

been plotted to give an octagonal figure, the area of which was derived from the formula

$$\frac{\sqrt{(a+b)(c+d)}}{2}$$

where a = half the vertical height of the blind spot, b = half its width, and c and d = half of each of the two diagonals. It had been shown that this formula provided a useful approximation to the blind spot area and gave consistent results. The success of dehydration therapy had been shown not only by a reduction of blind spot size but also by the fact that no serious loss of visual acuity occurred in any of the patients treated. Confirmation of the validity of the blind spot measurements had been obtained by fluorescein angiography and colour photographs.

In future, fluorescein angiography was likely to be mainly of value in assisting diagnosis in cases of doubtful papilloedema. Some patients developed mild optic atrophy which was not accompanied by functional loss of vision.

It was concluded that neither surgery nor steroid therapy were necessary for the management of papilloedema in the overweight female and that Chlorthalidone appeared to be the most efficient of the dehydrating agents which had been studied.

AVOIDANCE OF SHUNT DEPENDENCY

JOSEPH RANSOHOFF AND FRED EPSTEIN (New York) observed that total shunt dependency with all its sequelae is a frequent complication of shunting procedures used in the treatment of hydrocephalus. Most authors with extensive experience of the treatment of hydrocephalic children had reported only a 25–30% success rate over a 10–15 year follow-up period. To eliminate or minimize shunt dependency the authors had attempted to avoid implanting shunting systems and had attempted to arrest hydrocephalus by cranial compression with resultant increase in spinal fluid absorption. If this form of therapy were contraindicated or unsuccessful, an 'on-off' shunt was inserted to drain CSF electively, and attempts were made over extended periods to discontinue use of shunting systems. The aim of this procedure was to achieve a state of compensated hydrocephalus. If this aim were not realized and it was clear that a child needed to remain dependent on a shunt, an effort was made to maintain the ventricles at a larger size than normal while preserving a minimum of 3 cm of frontal cortical mantle.

The authors believed that this regime would make future obstructions of the ventricular ends of shunts less common and would facilitate revisions of shunts. Should a child with small ventricles become shunt dependent despite all these measures, subtemporal craniectomy was advocated to allow the lateral