Abstracts

AB-4518-78
Clinicopathological Study of Cerebral Aneurysms. Origin, Rupture, Repair, and Growth — Suzuki J (Division of Neurosurgery, Tohoku University School of Medicine, Institute of Brain Diseases, Sendai, Japan 982), Ohara H — J Neurosurg 48: 505-514 (Apr) 1978*

The origin and mechanism of rupture, repair, and growth of intracranial saccular aneurysms are reported in an investigation of 45 aneurysms (23 unruptured and 22 ruptured) found in 34 brain specimens. Gaps in the media at the bifurcations of cerebral arteries are important for aneurysmal formation. The walls of aneurysms smaller than 3 mm in diameter are mainly composed of endothelial cells, and fibrous tissue. When aneurysms grow larger than 4 mm, the walls become collagenous and extremely thin portions develop in their domes, forming potential rupture points. Immediately after the rupture, bleeding is stopped by clot and a new fibrin layer is formed around the rupture point. It is proposed that the cerebrospinal fluid has a special accelerating action in clot formation. This fibrin layer is weak, and repeat rupture occurs within 3 weeks after the initial hemorrhage. However, after 3 weeks, reblooding is rare due to the reinforcement of this layer, and capillaries appear in this new wall. Hemorrhages from these capillaries occur within and outside the new wall caused by the constant impingement of blood flow. In severe cases, the aneurysm ruptures again, but when the hemorrhages are slight, the aneurysm grows as the wall is thickened by repeated hemorrhages and their absorption. This may explain the growth mechanism of the aneurysm.

AB-4519-78

From a larger series of autopsies with subarachnoid hemorrhage (SAH), 20 cases were selected for the known complication of cerebral vasospasm. Evidence for vasospasm was radiological and pathological in 17 cases and pathological alone in three. A systematic histological examination of the large arteries in places known formerly to have been in spasm showed that, in the 12 early cases (death before 3 weeks), there were relevant changes in all the layers of the arterial wall, the most significant being evidence of necrosis in the tunica media. In the eight late cases (death after 3 weeks), in addition to the sequelae of the earlier acute changes, there was marked concentric intimal thickening by subendothelial fibrosis, again located in the segments of arteries formerly in spasm. Changes were also found in the small arteries, capillaries, and veins, both in the early and late cases but these changes, although striking, were thought to be caused by the ischemia due to the vasospasm; similar changes were also seen in the control cases with ischemia from arterial occlusion.

AB-4520-78
Carotid Paraclinoid Aneurysms With Intradural Origin and Intracavernous Location — Nutik S (Department of Neurosurgery, Centre Hospitalier Universitaire, University of Sherbrooke, Sherbrooke, Quebec, Canada J1H 5N4) — J Neurosurg 48: 526-533 (Apr) 1978*

Five cases of a congenital berry aneurysm of the internal carotid artery with origin partially intradural and fundus mainly intracavernous are presented. Angiography does not allow a precise definition of the amount of aneurysm that is intradural, a fact of importance when planning treatment of these cases. However, the angiographic features are characteristic of the type and suggest that these aneurysms be grouped together as a separate entity.

AB-4521-78
Microsurgical Anatomy of the Posterior Cerebral Artery — Zeal AA, Rhoton AL Jr (Neurological Surgery, University of Florida Health Center, Gainesville, Florida 32610) — J Neurosurg 48: 534-559 (Apr) 1978*

In order to define the microsurgical anatomy, 50 posterior cerebral arteries (PCA's) were examined using × 3 to × 40 magnification. The PCA was divided into four segments: P1 was the segment proximal to the posterior communicating artery (PCOa); P2 extended from the PCoA to the posterior margin of the midbrain and was subdivided into an equal anterior (P2A) and posterior (P2P) half; P3 began at the posterior midbrain, ran within the quadrigeminal cistern, and ended at the anterior limit of the calcareous fissure. The PCA had three types of branches: 1) cortical branches to the cerebrum; 2) central branches to the brain stem; and 3) ventricular branches to the choroid plexus. The largest branches reaching the lateral surface of the cerebrum were located immediately anterior to the preoccipital notch, and in most cases were branches of the posterior temporal artery. This area offers a greater than 75% chance of finding a vessel large enough to perform a microvas-
cular anastomosis. The central branches were of two types: 1) direct perforating, and 2) circumferential. The direct perforating branches arising on P1 were the posterior thalamoperforating arteries. The "thalamo-genulate artery," the vessel said to be occluded in the "thalamic syndrome," was also of the direct perforating type, but it was a series of small arteries arising from P2A and P2P rather than being a single vessel. The circumferential arteries usually arose from P1 and encircled the midbrain providing branches as far posteriorly as the colliculi. The branches to the choroid plexus were the medial and lateral posterior choroidal arteries; the former usually arose from P2A and entered the roof of the third ventricle, and the latter arose as a series of arteries from P2P and passed over the pulvinar to enter the lateral ventricle.

**AB-4522-78**

Vertebrobasilar Spasm: A Significant Cause of Neurological Deficit in Head Injury — Marshall LF (Division of Neurological Surgery, University of California Medical Center, San Diego, California 92103), Bruce DA, Bruno L, Langfitt TW — J Neurosurg 48: 560-564 (Apr) 1978*

Cerebral vasospasm in the anterior circulation has been recognized as a significant factor in the sequelae of head injury; however, vertebrobasilar spasm resulting from trauma has received much less attention. In the past year we have observed six patients where spasm in the major vessels of the posterior circulation was primarily or in part responsible for the neurological deficit. In such cases, the neurological examination may suggest a supratentorial mass with herniation and, in three of our cases, burr holes or carotid angiography were performed first. However, in every instance neurological signs present on admission indicated primary brain-stem dysfunction. In each of the six cases vertebro angiography demonstrated significant spasm in either the vertebral or basilar arteries. Intracranial pressure was monitored in each of the six patients and did not exceed 25 mm Hg in any. In cases of head injury where the neurological examination indicates brain-stem dysfunction inconsistent with or after a supratentorial mass has been excluded, vertebral angiography may aid in the diagnosis and subsequent management of such patients.

**AB-4523-78**

Moyamoya Disease Associated With Aneurysm — Kodama N (Division of Neurosurgery, Institute of Brain Diseases, Tohoku University School of Medicine, Sendai 982, Japan), Suzuki J — J Neurosurg 48: 565-569 (Apr) 1978*

Five cases of moyamoya disease associated with aneurysm are reported. In three cases, the aneurysms were located at the peripheral portion of the posterior choroidal artery, and in two at the basilar artery. Based on these cases, the symptoms and mechanisms of formation of aneurysms in moyamoya disease are discussed.

**AB-4524-78**

Aphasia and Left Thalamic Hemorrhage — Reynolds AF Jr (Division of Neurosurgery, University of New Mexico, Albuquerque, New Mexico 87131), Harris AB, Ojemann GA, Turner PT — J Neurosurg 48: 570-574 (Apr) 1978*

Left thalamic hemorrhage as a cause of aphasia has not been widely recognized. Large thalamic hemorrhages cause coma, making speech examination impossible; smaller thalamic hemorrhages were difficult to document until recent diagnostic advances. Nine cases of thalamic hemorrhage with aphasia have been described in the literature. This report presents four additional cases. These patients had acute onset of aphasia, supranuclear paralysis of upward gaze, right hemisensory deficits, and mild right hemiparesis. Three of the four patients responded to ventriculostomy drainage with rapid clearing of the supranuclear paralysis of upward gaze, and two later required placement of permanent ventricular shunts. After 1 year, two patients exhibited no clinically detectable speech malfunction and the other two were severely aphasic. The hemiparesis, hemisensory deficits, and ocular pareses all cleared. These cases are discussed with respect to present models of the role of the thalamus in speech.

**AB-4525-78**

Cerebellar Hemorrhage in Adults. Diagnosis by Computerized Tomography — Little JR (Department of Neurosurgery, Montreal Neurological Institute, Montreal, Quebec, Canada H3A 2B4), Tubman DE, Ethier R — J Neurosurg 48: 575-579 (Apr) 1978*

A series of 10 adult patients with cerebellar hemorrhage diagnosed by computerized tomography (CT) is described. Hypertension was the most common etiological factor, accounting for 70% of the cases. The clinical presentation appeared to fall into two basic groups. The first group (60% of the cases) ran a progressive course with early brain-stem compression. The second group had a benign course with findings of focal cerebellar dysfunction. The CT findings reflected the two clinical categories. The scans of Group 1 patients revealed a large hematoma (≥ 3 cm) and substantial ventricular dilatation. In contrast, scans of Group 2 patients demonstrated a small hematoma (< 3 cm) without ventricular dilatation. Use of CT scanning allowed the accurate differentiation of cerebellar hemorrhage from primary brain-stem and intraventricular hemorrhage. The findings of the CT investigations proved very helpful in defining appropriate therapy.

**AB-4526-78**

Basal Rupture of Saccular Aneurysm. A Pathological Case Report — Fisher CM (Department of
Neurology, Massachusetts General Hospital, Boston, Massachusetts 02114, Ojemann RG — J Neurosurg 48: 642-644 (Apr) 1978*

In a case of subarachnoid hemorrhage, the arteries of the circle of Willis were left undisturbed and undissected at postmortem examination. A block of frontal lobe tissue with the attached vessels was serially sectioned disclosing in its entirety a saccular aneurysm that had ruptured at the base rather than the dome. The histology of the hemostatic process was clearly depicted.

AB-4527-78


A population of 199 patients from Rochester, MN, was followed from the time of their first carotid or vertebral-basilar transient ischemic attack (TIA). Patients treated with anticoagulants had no significant difference in survival from untreated patients. Among patients with carotid TIA who received anticoagulants, the net probability of stroke was slightly but not significantly lower than in untreated patients. The difference favoring treated patients with vertebral-basilar TIA was significant starting at three months.

The rate of intracranial hemorrhage was higher among all patients receiving anticoagulant treatment than among untreated patients and was significantly higher among those 55 to 74 years old. Almost all the hemorrhages occurred after a year or more of anticoagulant treatment and in patients more than 65 years old.

Patients with high diastolic blood pressure had a significantly higher net probability of stroke than did patients with lower blood pressure and those receiving antihypertensive drugs. By implication, treatment of hypertension was effective in preventing stroke in patients with TIA.

Linear discriminant analysis and actuarial analysis indicated that diastolic blood pressure and anticoagulant therapy were the only factors that influenced stroke occurrence. There was no suggestion that previous myocardial infarction, angina pectoris, valvular heart disease, cardiac arrhythmia, or congestive heart failure — individually or in combination — influenced the occurrence of stroke or survival.

AB-4528-78

Ischemia-Induced Seizures and Cortical Monoamine Levels — Welch KMA (Department of Neurology, Baylor College of Medicine, Houston, Texas 77030), Wang T-PF, Chabi E — Ann Neurol 3: 152-155 (Feb) 1978*

Seizure activity as a component of the ischemic process possibly responsible for monoamine changes described in the gerbil stroke model was the subject of this study. Abnormal motor activity suggestive of seizures developed one to three hours after unilateral ligation of the common carotid artery in approximately 50% of gerbils that exhibited signs of stroke. Reduction of cortical levels of dopamine and norepinephrine was observed only when seizures occurred in association with stroke. The levels of 5-hydroxytryptamine were reduced bilaterally in animals with and without signs of stroke and were reduced further in animals with stroke plus seizures.

Further study is needed to establish whether the catecholamine changes associated with ischemia-induced seizures are primary and causative or secondary to seizure activity itself. In the ischemic brain, 5-hydroxytryptamine metabolism appears disordered independent of seizure activity. Seizure activity must be taken into account when the mechanisms of disordered monoamine metabolism are being examined in the gerbil stroke model.

AB-4529-78

Bacterial Intracranial Aneurysm — Bohmfalk GL, Story JL (Division of Neurosurgery, University of Texas Health Science Center, San Antonio, Texas 78284), Wissinger JP, Brown WE Jr — J Neurosurg 48: 369-382 (Mar) 1978*

The authors tabulate and analyze cases of bacterial intracranial aneurysm documented since 1954, and add four of their own. In 85 cases the overall mortality was 46%. Elimination of patients dying before reaching the hospital makes this figure spuriously low. Figures for patients hospitalized for endocarditis before neurological symptoms occurred suggest a true mortality of 80% from aneurysms that rupture and 30% if the aneurysm remains intact. Multiple reports of spontaneously resolving, enlarging, diminishing, multiple, and sequentially appearing aneurysms, all of which occurred in our fourth case, clarify the need for complete and sequential angiography. Computerized tomographic (CT) scanning in this disease has not been reported, but our experience with these scans demonstrates considerable potential value.

A protocol of complete cerebral angiography and CT scanning of these neurologically asymptomatic patients is proposed, in order to assess the true incidence of bacterial intracranial aneurysm, to learn more of its natural history, and to prevent some neurological catastrophes.

AB-4530-78

Arterial Blood Gases During Raised Intracranial Pressure in Anesthetized Cats Under Controlled Ventilation — Jennett S (Department of Physiology, University of Glasgow, Glasgow G12 8QQ, Scotland), Hoff JT — J Neurosurg 48: 390-401 (Mar) 1978*

In anesthetized paralyzed cats ventilated with air, blood gases were analyzed repeatedly before and dur-
AB-4531-78
Effect of Atropine on Cerebrovascular Responsiveness to Carbon Dioxide — Matsuda M (Department of Neurosurgery, Kyoto University Medical School, Kyoto 606, Japan), Yoneda S, Gotoh H, Handa J, Handa H — J Neurosurg 48: 417-422 (Mar) 1978*

Effects of cholinergic inhibition by atropine on cerebral circulation were studied in 15 baboons anesthetized with sodium pentobarbital. Intravertebral infusion of atropine, 0.1 mg/kg, did not cause any changes in cerebral blood flow (CBF), superior sagittal sinus wedge pressure (SSWP), epidural pressure (EDP), cerebral perfusion pressure, or cerebral vascular resistance under normal conditions. Cerebrovascular responsiveness to carbon dioxide (CO₂) inhalation was not influenced by atropine. The presence of cholinergic nerve fibers has been proved in the cerebral blood vessels and the existence of cholinergic mechanism suggested in the brain stem, but it is not likely that the cholinergic nerves have tonic control of cerebral blood vessels in the resting state or affect cerebrovascular responsiveness to CO₂. The changes in EDP and those in SSWP showed a very good correlation to each other. There was also a good correlation between the changes in CBF and those in EDP or SSWP.

AB-4532-78

A case of spontaneous intra-aneurysmal thrombosis, verified angiographically, is reported in a patient with subarachnoid hemorrhage and without surgical intervention. The frequency of such an occurrence and the factors involved are reviewed and discussed.

AB-4533-78
Prognostic Factors in the Survival of 1,484 Stroke Cases Observed for 30 to 48 Months. I. Diagnostic Types and Descriptive Variables — Abu-Zeid HAH (Faculty of Medicine, University of Manitoba, Winnipeg, Manitoba, Canada R3E OW3), Choi NW, Hsu P-H, Maini KK — Arch Neurol 35: 121-125 (Mar) 1978*

Survival and factors affecting survival were studied in 1,484 new cases of acute definite stroke occurring between Jan 1, 1970, and June 30, 1971, in Manitoba. The 962 infarctions, 279 hemorrhages, and 243 unidentified strokes were ascertained from hospital claim reports. Personal, clinical, and laboratory data were collected from hospital medical records, death certificates, and autopsy reports. Cases were followed up until Dec. 31, 1973, to determine survival. Survival was significantly better in infarction than in hemorrhage, in subarachnoid hemorrhage than in intracerebral hemorrhage, in men than in women, in the young than in the old, in the married than in the single, in hemorrhage cases from rural areas than from urban areas, and in those discharged home than in those transferred to long-term care hospitals. These data may help in predicting the outcome of stroke and in planning for more efficient care.

AB-4534-78
Prognostic Factors in the Survival of 1,484 Stroke Cases Observed for 30 to 48 Months. II. Clinical Variables and Laboratory Measurements — Abu-Zeid HAH (Faculty of Medicine, University of Manitoba, Winnipeg, Manitoba, Canada R3E OW3), Choi NW, Hsu P-H, Maini KK — Arch Neurol 35: 213-218 (Apr) 1978*

Using the life table method, 962 cases of infarction, 279 cases of hemorrhage, and 243 cases of undetermined type of stroke, occurring in Manitoba between Jan 1, 1970, and June 30, 1971, were analyzed for factors affecting survival. Survival until Dec. 31, 1973, was found to be adversely affected by the presence of coma or unconsciousness and the absence of localizing signs and symptoms. Also, the prognosis was poor if the heart was enlarged on the x-ray film or the ECG was abnormal. On the other hand, the presence of individual clinical entities such as hypertension, hypertensive heart disease, myocardial infarction, atrial fibrillation, or diabetes did not affect the survival significantly. These findings will help in predicting the prognosis and in planning for management of stroke cases.

AB-4535-78
Ataxic Hemiparesis. A Pathologic Study — Fisher CM (Department of Neurology, Massachusetts General Hospital, Boston, Massachusetts 02114) — Arch Neurol 35: 126-128 (Mar) 1978*

*Author's abstract
ABSTRACTS

Three stroke patients showed weakness and pyramidal signs on one side combined with a cerebellar-like ataxia on the same side. Pathologic study in each case showed an old infarct cavity in the basis pontis at the level of the junction of the upper one third and lower two thirds on the side opposite the neurologic deficit. The basilar artery was patent and the infarcts were probably the result of occlusion of penetrating arteries. This study demonstrates that a lesion of the basis pontis may be associated with a contralateral ataxia that is cerebellar in character. The designation ataxic hemiparesis is suggested for the syndrome.

AB-4536-78

Early Restenosis After Carotid Endarterectomy —
Cossman D, Callow AD (171 Harrison Avenue, Boston, Massachusetts 02111), Stein A, Matsumoto G — Arch Surg 113: 275–278 (Mar) 1978*

Restenosis within 24 months of carotid endarterectomy was discovered in 3.6% of 361 operations. The patients in this group of restenosis tended to be younger than the overall group. Hypertension and hyperlipidemia were also more frequent. Restenosis occurred within an average of 12.5 months of the first operation, with a range from five to 24 months. No surgical technical causes could be found. Restenosis is attributed to rapid, exuberant myointimal proliferation. This process is histologically distinct from the atherosclerotic plaque which is the cause of late restenosis. Reoperation on this group of patients with the fibrous myointimal proliferative type of lesion was difficult and was infrequently associated with improvement in the patients' signs and symptoms.

AB-4537-78

Acute Central Retinal Artery Occlusion and Optic Disc Neovascularization. Occurrence in a Patient With Carotid Artery Disease —

A patient with carotid artery insufficiency was initially seen with an acute central retinal artery (CRA) occlusion and optic disc neovascularization. He had noted the prior occurrence of amaurosis fugax in the involved eye, which suggests a previously existing ischemic oculopathy upon which a CRA occlusion was superimposed.

AB-4538-78

Ischemic Optic Neuropathy in Cavernous Sinus Thrombosis —
Friberg TR, Sogg RL (Division of Ophthalmology, Stanford University Medical Center, Stanford, California 94305) — Arch Ophthalmol 96: 453–456 (Mar) 1978*

Visual loss is uncommon in thrombosis of the cavernous sinus. A patient observed closely in the acute stages developed high intraocular and intraorbital pressures. Although the retinal vasculature remained patent, total unilateral blindness occurred within 48 hours. To our knowledge this is the first documented case in which ischemic optic neuropathy caused blindness in a patient suffering from cavernous sinus thrombosis.

AB-4539-78

Normal Serum-Cholesterol But Low H.D.L.-Cholesterol Concentration in Young Patients With Ischaemic Cerebrovascular Disease —
Rössner S (Department of Internal Medicine, Karolinska Hospital, S-104 01 Stockholm 60, Sweden), Kjellin KG, Mettinger KL, Söderström CE — Lancet 1: 577–579 (Mar 18) 1978*

Serum-lipoproteins were determined in male and female patients aged under 55 who had survived an attack of ischaemic cerebrovascular disease (I.C.D.). The results were compared with findings in healthy controls. Total serum triglyceride and cholesterol concentrations were not increased. However, in the very-low-density lipoprotein fraction increased cholesterol concentrations were found, and the mean value of high-density-lipoprotein (H.D.L.) cholesterol in I.C.D. patients was 18% lower than in controls. Since a low H.D.L.-cholesterol concentration has been suggested as an independent strong risk factor, it is possible that the susceptibility of I.C.D. patients to atherosclerosis is the result of a low H.D.L. rather than hyperlipoproteinemia.

AB-4540-78

Predicting Risk of Ischemic Heart Disease and Cerebrovascular Disease From Systolic and Diastolic Blood Pressures —
Rabkin SW (Manitoba Follow-Up Study, Faculty of Medicine, Winnipeg, Manitoba, Canada R3E 0W3), Mathewson FAL, Tate RB — Ann Intern Med 88: 342–345 (Mar) 1978*

The relative importance of systolic versus diastolic blood pressure in predicting risk of ischemic heart disease or cerebrovascular disease is controversial. Since 1948 we have observed in the Manitoba Study 3983 men (most between 25 to 34 years old at entry), in whom risk of both diseases was determined using the multiple logistic model. Systolic and diastolic blood pressures after adjustment for age and body weight were compared at entry and at four other examinations during the follow-up period. When both blood pressures were considered together, a stronger association with cerebrovascular disease was found for systolic compared to diastolic blood pressure at entry and at most of the other examinations. For ischemic heart disease, diastolic pressure showed a stronger association at the earlier examinations, whereas systolic pressure was more important when the majority of the cohort was between 40 to 50 years of age. In middle-aged men the general concept that diastolic is more important than systolic is not justified for cerebrovascular disease or for ischemic heart disease.
AB-4541-78

Subdural Hematomas Due to Ruptured Cerebral Aneurysms: Angiographic Diagnosis and Potential Pitfall for CT — Handel SF (Department of Diagnostic Radiology, University of Texas Medical School, Hermann Hospital, Houston, Texas 77030), Perpetuo FOL, Handel CH — Am J Roentgenol 130: 507-509 (Mar) 1978*

Two patients with subdural hematoma secondary to rupture of intracranial aneurysms are described. Computed tomography and plain skull films are generally the examination of choice for the patient with significant head trauma. In selected patients, however, cerebral angiography in place of, or along with, computed tomography may be necessary to demonstrate an underlying cause for the subdural hematoma.

AB-4542-78

Moyamoya Disease in Children — Schoenberg BS (Section on Epidemiology, OB, OD, NIH-NINCDS, Room 7C10, Federal Building, Bethesda, Maryland 20014), Mellinger JF, Schoenberg DG — South Med J 71: 237-241 (Mar) 1978*

A review of the recent Mayo Clinic experience with stroke in children having cerebral angiography revealed five patients with moyamoya disease. The disease commonly presents as recurrent strokes and only rarely as a seizure disorder. The angiographic pattern suggests that the telangiectasia characteristic of this condition represents normally present dilated vessels.

AB-4543-78

Epidural Hematoma of the Posterior Fossa: Radionuclide Features — Hulvat GF, Batnitzky S (Department of Diagnostic Radiology, University of Kansas Medical Center, Kansas City, Kansas 66103), Wellman BN — Radiology 127: 194 (Apr) 1978*

Since epidural hematomas usually present as acute neurosurgical emergencies, they are rarely studied by radionuclide imaging. An epidural hematoma in the posterior fossa showed characteristic anterior displacement of the torcular Herophili and separation of the superior sagittal sinus from the inner table of the skull on cerebral radionuclide imaging and angiography.

AB-4544-78

Clinical Significance of Plasma Adrenaline and Noradrenaline Concentrations in Patients With Subarachnoid Haemorrhage — Benedict CR (Department of Medicine, Johns Hopkins Medical School, Johns Hopkins Hospital, Baltimore, Maryland 21205), Loach AB — J Neurol Neurosurg Psychiatry 41: 113-117 (Feb) 1978*

Plasma adrenaline and noradrenaline concentrations were measured in 21 patients after subarachnoid haemorrhage and in 13 control patients. Plasma noradrenaline concentrations were significantly raised in patients recovering from subarachnoid haemorrhage, confirming clinical evidence of overactivity of the sympathetic nervous system. Plasma noradrenaline concentrations in patients with a poor result were significantly higher at the time of admission than in patients with a good result, and the differences became more significant two to three days later. Therefore, the measurement of plasma noradrenaline concentrations may be a valuable test to assist clinical assessment in distinguishing between the two groups preoperatively.

AB-4545-78

Platelet Adhesiveness, Plasma Fibrinogen, and Fibrinolytic Activity in Young Patients with Ischaemic Stroke — Sharma SC (Department of Pathology, AIIMS, New Delhi-110016, India), Vijayan GP, Seth HN, Suri ML — J Neurol Neurosurg Psychiatry 41: 118-121 (Feb) 1978*

Cerebral thromboembolic stroke in the young is uncommon. Disturbances in the normally existing dynamic equilibrium between coagulation and fibrinolysis may play a major role in the pathogenesis of such episodes. In a search for a possible hyper-coagulable state platelet adhesiveness by the method of Eastham, plasma fibrinogen and euglobulin clot lysis times were estimated in 46 patients. A group of 15 normal subjects matched for age and sex were also studied for comparison. Significant increase in platelet adhesiveness (P < 0.001) and plasma fibrinogen (P < 0.001) was noted in the patients when compared with the normal subjects. Absence of corresponding increases in fibrinolytic activity in the patients suggests disturbed equilibrium between coagulation and fibrinolysis. The possibility of a hypercoagulable state in these cases is discussed.

AB-4546-78

Correlation Between Angiographic Findings and the Ischaemia of Head Injury — Macpherson P (Division of Neuroradiology, Institute of Neurological Sciences, Southern General Hospital, Glasgow G51 4TF, Scotland), Graham DI — J Neurol Neurosurg Psychiatry 41: 122-127 (Feb) 1978*

The carotid angiograms of 96 patients who had died from non-missile head injury were reviewed and assessed for evidence of arterial spasm, slowing of the cerebral circulation, and the presence of intracranial haematoma. As bilateral angiography had been done in 44 cases the results are based on a correlation between the angiographic appearances and the presence or absence of ischaemic brain damage in the cortex of 140 cerebral hemispheres. There was a significant relationship between spasm alone, the presence of intracranial haematoma alone, or their combination, and ischaemic damage in the ipsilateral cortex. Apart from an association between the more severe grades of spasm and slowing of circulation in
the group with ischaemia within arterial territories, there was none between slowing of the circulation or the combination of slowing with either spasm or haematoma and ischaemic brain damage.

AB-4547-78
Rehabilitation Outcome of Patients With Dual Disability of Hemiplegia and Amputation — Varghese G (Department of Rehabilitation Medicine, University of Kansas Medical Center, Kansas City, Kansas 66103), Hinterbuchner C, Mondall P, Sakuma J — Arch Phys Med Rehabil 59: 121-123 (Mar) 1978*

The records of 30 patients with the dual disability of hemiplegia and amputation were reviewed. Six factors noted to have influenced the success of rehabilitation were: (1) age; (2) sequence of onset of disability, whether amputation or hemiplegia first; (3) localization of dual disability, whether ipsilateral or contralateral; (4) side of hemiplegia; (5) level of amputation; (6) availability of prolonged hospital stay and training. The final functional status was better if: (1) the amputation preceded the CVA; (2) the amputation and hemiplegia were ipsilateral; (3) amputation and hemiplegia were both on the right side. The hospital stay of patients with dual disability ranged from 4 months to 1 year. Those who had disability on contralateral sides and those who had left hemiplegia required a more prolonged hospital stay.

AB-4548-78

Thirty patients with basilar artery migraine were followed up for a period of six months to three years. The mean age of onset was 7 years. The patients were seen with recurrent transient attacks of neurological disturbances localized to the vertebrobasilar arterial tree. Attacks often included pulsatile cephalgia. A history of migraine was present in 86% of the families studied. The majority of family members with migraine were female and on the maternal side. Permanent neurological residua developed in only one patient. There was a tendency for attacks to be more severe with an older age of onset. Basilar artery migraine is a migraine variant that may affect children from late infancy through adolescence.

AB-4549-78

The effect of hypoxia on cerebral blood flow in ducks was investigated by the rate at which arterially injected xenon-133 was cleared from the duck’s brain. A two-component clearance curve resulted, which we have attributed to flow through the grey and white matter. Decreasing the arterial oxygen tension (PaO₂) to 75 mmHg had no effect on cerebral blood flow. However, decreasing the PaO₂ below 75 mmHg significantly increased blood flow to the fast-clearing compartment. The greatest increase in blood flow was seen when the arterial Po₂ was below 50 mmHg. At an arterial Po₂ of 30 mmHg, the cerebral blood flow to the fast-clearing compartment was increased more than 600% above the normoxic level. The magnitude of this increase is much greater in the duck than has been reported for mammals at roughly equivalent arterial oxygen tensions. The ability of avian cerebral blood flow to increase at moderate levels of hypoxia, plus the magnitude of the increase, may play a role in the exceptional tolerance of birds to hypoxia.

AB-4550-78

Cylindrical segments of carotid arteries from rat, rabbit, and dog were studied in vitro in order to compare active and passive mechanical properties, with gross morphology and composition. Pressure-diameter relations were determined under active (norepinephrine) and passive (2 mM EGTA) conditions, and were used to compute values of tangential wall stress, incremental elastic moduli, characteristic impedance, and active smooth muscle responses. The water and connective tissue contents of these segments were also determined. Significant differences were found in the passive mechanical properties of these arteries, with those of the rat being most compliant and those of the dog being the stiffest. These differences were consistent with the connective tissue content of these arteries. The ratio of collagen to elastin was smallest in the rat and largest in the canine carotids. Differences were also demonstrated in the responses to smooth muscle activation. The maximum value of active stress response was essentially the same in the canine and rabbit arteries, both of which were larger than that of the rat carotids. On the other hand, the rabbit vessels produced a larger maximum diameter response than either of the other arteries. Values of incremental elastic modulus were largest at specific values of transmural pressure for the rabbit vessels. This latter fact may make the contractile system more effective in reducing wall diameter in the rabbit arteries in spite of the fact that they did not have the capacity to generate a larger active stress response.

AB-4551-78
Potentiation of the Cerebrovascular Response to Intra-Arterial 5-Hydroxytryptamine — Eidelman BH (Department of Physiology, University of the Witwatersrand, Johannesburg 2001, South Africa),

Infusion of 5-hydroxytryptamine (5HT) into the internal carotid artery of normal baboons was not accompanied by alteration of gray matter cerebral blood flow. In animals pretreated with depot estrogen and progesterone (dosage equivalent to oral contraceptive preparations), infusion of 5HT produced a marked decrease in gray matter blood flow. A similar decrease in flow was obtained when the 5HT was infused with a concentrate of β-lipoprotein. Steroid substances appear to enhance the cerebrovascular constrictor responses to 5HT. A further series of six experiments has shown that the monoamine oxidase inhibitor tranylcypromine similarly produced constrictor responses to 5HT. It is possible that the steroids, the β-lipoprotein, and the tranylcypromine produced constrictor responses to 5HT by the same mechanism (inhibition of cerebrovascular monoamine oxidase).

AB-4552-78

**Occlusion of the Intradural Vertebrobasilar Artery** — Thompson JR (Department of Radiation Sciences, Loma Linda University Medical Center, Loma Linda, California 92354), Simmons CR, Hasso AN, Hinshaw DB Jr — *Neuroradiology* 14: 219–229 (Feb 17) 1978*

The diagnosis of occlusion of the intradural vertebrobasilar artery (OIDVBA) was made by means of cerebral angiography in 22 patients. The clinical presentation, course and followup were studied in conjunction with the angiographic findings in each case and the following conclusions made. OIDVBA is not rare. It occurs one-fourth as often as occlusion of the carotid artery. The correct diagnosis is not made clinically before angiography in the majority of patients. Complete visualization of the neck and intracranial vasculature is necessary to document the occlusion. Atherosclerotic thrombosis is the most common type of occlusive lesion. The most common predisposing factors are atherosclerosis, hypertensive cardiovascular disease, diabetes mellitus, and developmental vertebrobasilar hypoplasia. Most patients with occlusion are in the 7th and 8th decades of life and transient attacks of vertebrobasilar ischemia precede the occlusion in one-half of the cases. Emboli usually lodge in the terminal portion of the basilar artery whereas thrombotic occlusions tend not to be located in a characteristic segment. A majority of patients diagnosed angiographically survive their OIDVBA, but most distal occlusions result in death, often following several weeks of coma. In the surviving majority, disturbance of gait, impairment of vision, and symptoms of transient vertebrobasilar ischemia are the most common sequelae.

AB-4553-78


Dopamine (DA), serotonin (5-HT), and 5-hydroxyindole acetic acid (5-HIAA) were assayed spectrophotometrically in various brain regions of 8 human patients who died after acute and old cerebral infarction. In both recent and older infarcts a total depletion of DA and 5-HT was associated with slight reduction of DA and 5-HT levels in remote non-ischemic areas and various nuclei of both the injured and contra-lateral hemispheres. 5-HIAA was significantly reduced in acute ischemic necrosis, while the perifocal edema zone showed considerable accumulation of both 5-HT and 5-HIAA. The degradation zone surrounding old infarcts showed a mild decrease of both 5-HT and 5-HIAA, indicating normalization of 5-HT metabolism and turnover after decrease of cerebral edema. These preliminary data which confirm previous findings in experimental cerebral ischemia and infarct indicate that disorders of brain monoamine metabolism are contributing to the development of postischemic brain damage and the complicating cerebral edema.

AB-4554-78

**Meningiomas and Aneurysms of the Cavernous Sinus. Neuro-Ophthalmologic Features** — Trobe JD, Glaser JS (Bascom Palmer Eye Institute, University of Miami School of Medicine, Miami, Florida 33152), Post JD — *Arch Ophthalmol* 96: 457–467 (Mar) 1978*

A series of 16 patients with unilateral ophthalmoplegia due to mass lesions of the cavernous sinus was analyzed; there were six cavernous meningiomas and nine intracavernous aneurysms. All meningiomas were characterized by painless, insidiously progressive partial nerve palsies, as were half of the aneurysms; the remaining aneurysm patients experienced acute painful episodes.

Pharmacologic pupillary tests failed to confirm a coexisting Horner syndrome in the majority of cases with anosocoria. Although plain skull films were unremarkable or misinterpreted as normal, bone tomograms, computerized axial tomograms, radio-nuclide scans, and cerebral angiograms established the diagnosis in all cases.

Because cavernous meningiomas show slow progression and are surgically inaccessible, craniotomy is advised only if the visual pathways or brain stem is compromised. Intractable pain appears to be the only distinct indication for intervention with cavernous aneurysms.

AB-4555-78

**Fibrinolytic Properties of Some Optic Nerve Vessels** — Peduzzi M (University Eye Clinic, Via del Pozzo 71, 41100 Modena, Italy) — *Arch Ophthalmol* 96: 507–510 (Mar) 1978*
The fibrinolytic activity of posterior ciliary arteries (PCA), dural vessels (DV), central retinal vessels (CRV), and pial plexus (PP) in 18 human eyes was studied by the fibrin-slide technique and PAS staining. Activity was measured on the basis of the minimal incubation time at which lysis appeared. A constant pattern of fibrinolytic activity was found. The PCA were the most active, followed by DV, CRV, and PP.

With consideration of the assumed antithrombotic role of fibrinolysis, the results suggest that PCA are better protected against occlusion than CRV.

**ABSTRACTS**

**Prevention of Stroke by Carotid Endarterectomy — Stanford JR, Lubow M, Vasko JS (Department of Thoracic Surgery, Ohio State University, Columbus, Ohio 43210) — Surgery 83: 259–263 (Mar) 1978**

Cerebral stroke can occur in patients having visual symptoms only. Fundoscopy is valuable in identifying those patients with visual symptoms who are likely to have carotid disease; and carotid endarterectomy can prevent a stroke in a significant percentage of patients at risk. Meticulous operative technique is essential. In a series of 187 carotid endarterectomies performed on 154 patients over a 7-year period, the operative mortality rate was zero. Operative morbidity was 1.3% in 139 patients who had no prior permanent neurological deficits, and 13% in 15 patients who had suffered previous strokes. Data compiled on follow-up for an average of 20 months indicated that six patients (4.7%) suffered postoperative strokes, nine patients (7%) experienced persistence of symptoms, and 113 patients (88.3%) remained neurologically well.

**Internal Carotid Back Pressure, Intraoperative Shunting, Ulcerated Atheromata, and the Incidence of Stroke During Carotid Endarterectomy — Hertzner NR (Cleveland Clinic Foundation, Cleveland, Ohio 44106), Beven EG, Greenstreet RL, Humphries AW — Surgery 83: 306–312 (Mar) 1978**

Carotid endarterectomy was performed at the Cleveland Clinic under a protocol which provided for the measurement of internal carotid back pressure and both selective and random shunt insertion in a total of 260 operations involving 253 patients. Indications for endarterectomy were transient ischemic attacks for 260 operations involving 253 patients. Indications for selective and random shunt insertion in a total of 143 operations, previous stroke for 23 operations, and asymptomatic carotid stenosis for 94 operations. Twelve patients (4.6%) sustained intraoperative neurological deficits of which five (1.9%) were permanent. Among 105 patients who had no shunt, three of their four intraoperative deficits were permanent. Among 155 patients who were shunted, two of their eight intraoperative deficits were permanent. Operations performed without shunts in the presence of low carotid back pressure (29 operations) produced a significant number (two) of permanent strokes. Both high back pressure and the use of shunts in the presence of low back pressure appeared to reduce the risk of permanent strokes. The use of shunts in the presence of high back pressure was associated with an increase in the incidence of temporary deficits (five), although only one persisted as a permanent stroke. Eleven of the 12 intraoperative neurological deficits (92%), including all five permanent strokes, occurred in patients with arteriographically ulcerated lesions. The 111 operations for ulcerated lesions were associated with intraoperative deficits in 9.9% of the operations and permanent strokes in 4.5%. The 134 operations for nonulcerated lesions were associated with intraoperative deficits in 0.7% of the operations and permanent strokes in 0%. The observations from this study suggest that cerebral embolization during dissection of the carotid artery is a significant factor in the etiology of intraoperative neurological deficits. Carotid shunts may reduce the incidence of subsequent permanent stroke by supplying adequate blood to an embolized area to minimize the neurological deficit.

**Localization of Injury in Arteries by I-125 Fibrinogen Uptake — Fonkalsrud EW (Department of Surgery, University of California, Los Angeles School of Medicine, Los Angeles, California 90024), Webber M, Sanchez M, Zerubavel R — Surgery 83: 338–344 (Mar) 1978**

The severity of arterial endothelial and medial injury as well as the extent and location within the vessel wall of thrombosis following 6 hours of ischemia or 6 hours of perfusion with D10W were evaluated at various time intervals by light and scanning electron microscopy and by I-125 fibrinogen uptake. Mild changes of arterial injury characterized by decreased endothelial cellularity and mild-to-moderate periadventitial vascular necrosis and thrombosis occurred within 48 hours after the period of ischemia and correlated well with a fourfold increase in I-125 fibrinogen uptake. Severe endothelial cell disruption decreased cellularity of the media, and prominent periadventitial hemorrhage and injury to the vasa vasorum were observed within 48 hours after perfusion with D10W. There was a concomitant 20-fold increase in I-125 fibrinogen uptake 48 hours after perfusion, which gradually decreased over the ensuing weeks to levels approximating those found in normal arteries by 3 months. Autoradiography studies show that the initial deposition of fibrinogen following injury was spread throughout the entire arterial wall; however, within 1 week the major residual fibrinogen uptake appeared in the vasa vasorum and to a lesser degree in the subintimal layer, with the striking absence of fibrinogen on the intimal surface. Biopsy specimens taken from 1 week to 2 months after D10W perfusion revealed gradual repopulation of the endothelial surface cells and return of normal architecture to the media which closely paralleled the decrease in I-125 fibrinogen uptake. These studies suggest that I-125 labeled fibrinogen may be a practical ex-
perimental method of gauging the severity of arterial injury and the rate of repair. The long-lasting fibrinogen deposition in the vasa vasorum following injury suggests that obstruction of these sensitive adventitial vessels may be responsible in part for the development of subsequent arterial fibrosis.

**AB-4559-78**

**Planned Extra-Anatomic Cerebral Revascularization for Carotid Artery Ligation — Bole PV (900 West Randol Mill Road, Arlington, Texas 76012), Babu S, Claus RH — Surgery 83: 440-444 (Apr) 1978**

Cerebral revascularization, using extra-anatomic bypass grafts of autologous saphenous vein, was performed in three patients to prevent or to compensate for ischemic effects of emergency ligation of a carotid artery. These ligations were required after spontaneous disruption of common carotid arteries in patients with previous irradiation and radical head and neck surgery. External-carotid-to-external-carotid cross-over (submandibular) bypass graft was performed once, and ipsilateral axillointernal carotid bypass grafts twice. The role of infection in carotid artery rupture, the unpredictable nature and different mechanisms of cerebral malfunctions after carotid ligation, technical details of extra-anatomic bypass grafts, and anatomic considerations in the prevention of recurrent infection and bleeding are discussed. A planned approach of cerebral revascularization at the time of ligation appears to be preferable to a fortuitous outcome. Neurological disability and death from cerebral ischemia can be prevented by using extra-anatomic bypass vein grafts.

**AB-4560-78**


One hundred forty-one patients with cerebral or cerebellar infarction were examined by computed tomography (CT) as soon as after the ictus as possible. The examination was repeated in 7 days, and a radionuclide brain scan was performed. The overall detection rate for ischemic infarction was approximately equal for both techniques, ranging from 58% for radionuclide scanning to 66% for the delayed CT. Almost half of the supratentorial infarcts examined by CT on the day of the ictus were demonstrated. Mass effect was observed as early as the first day and as late as the 25th day.

**AB-4561-78**


Concomitant cardiac procedures performed in conjunction with coronary bypass have become commonplace, but not concomitant noncardiac procedures. Bernhard and associates were the first to report concomitant coronary bypass and carotid endarterectomy. This series, begun in 1971, consists of 71 noncardiac procedures performed concurrently with coronary bypass on 68 patients. Thirty-seven procedures were performed for associated vascular disease, including carotid endarterectomy (25 patients) and resection of abdominal aortic aneurysm (three patients). Other concomitant problems included amputations, bronchogenic carcinoma, and hiatal hernia. The operative mortality rate of 2.9 percent compares very favorably with that of 1.7 percent in our group of patients having isolated coronary artery bypass. A plea is made for consideration of concomitant surgery in patients with operable coronary heart disease who have an additional serious noncardiac surgical disease.

**AB-4562-78**


This is a description of a simple method for continuous monitoring of pial vessel diameter changes. A photomultiplier was used to measure single pial vessels as seen through a cranial window in cats. By means of a selective interference filter, vascular red colour turns black and produces an extinction curve on a writer, the black compartment of the picture increasing with vasodilation and vice versa. With this method, rhythmical changes become visible, varying between 2 and 5 per min. The oscillations cannot be due to intravascular changes of oxygen tension; they are, however, similar to changes of local tissue oxygen tension and local blood flow.

**AB-4563-78**

**Studies on the Influence of Monoamines on the Cerebrovascular Response to Arterial Hypoxia — Ekström-Jodal B, Elfverson J (Department of Neurosurgery, University of Gothenburg, S-41315 Göteborg, Sweden), von Essen C — Acta Neurol Scand 57: 159-170 (Feb) 1978**

The cerebrovascular response to arterial hypoxia was studied during blockade of the vascular dopamine receptors and during alpha-adrenergic receptor stimulation and blockade in anaesthetized dogs. Dopamine-receptor blockade with pimozide or haloperidol invariably decreased the degree of hypoxic vasodilatation in the brain pointing to a functional
role of dopamine in this situation. Alpha-receptor blockade did not change the response, while stimulation of these receptors decreased the dilatory response even in deep arterial hypoxia.

**AB-4564-78**

Heparin-Induced Thrombocytopenia — Nelson JC, Lerner RG (Department of Medicine, New York Medical College, New York, New York 10029), Goldstein R, Cagin NA — Arch Intern Med 138: 548-552 (Apr) 1978*

Two patients with underlying thromboembolic disorders developed severe thrombocytopenia while receiving heparin sodium; one of these patients developed recurrence of the thrombocytopenia and possible heparin-induced pulmonary emboli when heparin was restarted. In a prospective study of patients receiving heparin in a coronary care unit (CCU), nine of 37 patients developed transient mild thrombocytopenia (platelet counts ranging from 88,000 to 150,000/cu mm). Heparin added to citrated platelet-rich plasma caused platelet aggregation in the two original patients, in three of six CCU patients tested, and in 17 of 87 other subjects, with maximum aggregation at concentrations of heparin likely to be present in vivo during therapy. We herein discuss evidence that suggests that heparin may cause or aggravate thrombosis by causing platelet aggregation. The occurrence of severe heparin-induced thrombocytopenia is well documented, and mild transient thrombocytopenia may be more common than has been recognized. Studies of heparin efficacy should take these responses into account.

**AB-4565-78**

Influence of Head Position on the Prognosis of Experimental Subarachnoid Hemorrhage — Hayakawa T, Waltz AG (Department of Neurology, Pacific Medical Center, San Francisco, California 94120) — Arch Neurol 35: 206-212 (Apr) 1978*

Autogenous blood was injected repeatedly into the intracranial subarachnoid space of cats, the heads of which were placed in one of four positions (prone, supine, left side down, and right side down). Epidural pressures, mean aortic blood pressures, and pulse rates were measured, and their responses to the repeated injections were analyzed. The distribution of the injected blood was different among the four groups. The cats in the supine position had the greatest amounts of blood in the posterior fossa and tolerated the injections least well. The position of the head at the time of a subarachnoid hemorrhage may influence the prognosis; positions that favor accumulations of blood around the brain stem carry the greatest risk.

**AB-4566-78**

Tolosa-Hunt Syndrome. Arteriographic Evidence of Improvement in Carotid Narrowing — Takeoka T, Gotoh F (Department of Neurology, School of Medicine, Keio University, Tokyo 160, Japan), Fukuchi Y, Inagaki Y — Arch Neurol 35: 219-223 (Apr) 1978*

Diagnosis of Tolosa-Hunt syndrome was made in a 25-year-old woman on the basis of unilateral third and sixth nerve paresis and possible involvement of the first branch of the ipsilateral trigeminal nerve, accompanied by headaches and ocular pain, which responded promptly to corticosteroid administration. Irregular narrowing of the right carotid siphon and occlusion of the homolateral superior ophthalmic vein were observed. During steroid therapy this stenosis improved in association with almost complete clinical recovery, although the vein was not recanalized. Of ten reported cases with contrast radiographic abnormalities, including our own, only two showed pupillary involvement. We hypothesize that the third nerve paresis with pupillary sparing in this syndrome may be attributable to the same underlying mechanism as that of diabetic ophthalmoplegia.

**AB-4567-78**

Fatal Massive Intracerebral Hemorrhage Complicating Cerebral Amyloid Angiopathy — Mandybur TI (Department of Pathology, University of Cincinnati Medical College, Cincinnati, Ohio 45267), Bates SRD — Arch Neurol 35: 246-248 (Apr) 1978*

A 58-year-old normotensive woman died 24 hours after a stroke. Two months earlier, she had a transient neurological episode consistent with cerebrovascular insufficiency. Necropsy demonstrated a massive recent hemorrhage in the right occipital lobe associated with severe cerebral amyloid angiopathy (CAA). The cerebral cortex showed interstitial and perivascular neuritic plaques but no Alzheimer's tangles. There was no family history of CAA.

A review of the literature indicated that only ten cases of such hemorrhage caused by nonfamilial CAA have been reported. Massive intracerebral hemorrhage seems to be more common in patients with familial Icelandic forms of CAA.

**AB-4568-78**


Six cases of fibromuscular dysplasia of the cervical and cephalic portions of the internal carotid arteries, including their intracranial branches are reported. It should perhaps be pointed out that one of the cases was from the Sudan. As far as we know, the condition has never before been reported in a male African. The condition was associated with an intracranial aneurysm in four of our cases. To our knowledge only
three autopsied cases of fibromuscular dysplasia involving intracranial arteries are on record. In our six cases the diagnosis was based on angiographic evidence, and three of the cases, two with intracranial involvement, were verified post mortem.

**AB-4569-78**

Subarachnoid Hemorrhage Due to Intraspinal Tumors

— Djindjian M (Service de Neurochirurgie du Professeur Caron, 51, avenue du Marechal de Lattre de Tassigny, 94100 Creteil, France), Djindjian R, Houdart R, Hurth M — *Surg Neurol* 9: 223-229 (Apr) 1978*

Five cases of subarachnoid hemorrhage arising from an intraspinal tumor are presented. Three of these were ependymomas in the region of the cauda equina. One was a neurofibroma at L1. The fifth was a hemangioblastoma in the upper lumbar region. The literature dealing with subarachnoid hemorrhage due to intraspinal lesions is reviewed. The majority of cases of spinal subarachnoid hemorrhage are due to arteriovenous malformations, but 50 cases in which the bleeding developed from a neoplasm have been reported.

**AB-4570-78**


A case of an aneurysm of the middle cerebral artery in a 17-month-old child has been presented and the literature on the problem reviewed. A total of 27 aneurysms in young children (under two years of age) has been found. The characteristics that define this group of patients are: a greater proportion of aneurysms of the middle cerebral artery and its branches and of the vertebrobasilar system; greater size of the aneurysms; and frequent pseudotumor syndromes. The surgical prognosis in this group of patients is excellent. The physical and pathophysiological characteristics of these aneurysms appearing in early childhood are described.

**AB-4571-78**

Intimal Dissection of the Superficial Temporal Artery

— Levinthal R (Section of Neurosurgery, Wadsworth Veterans Hospital, Los Angeles, California 90073), Gregorius FK — *Surg Neurol* 9: 268-269 (Apr) 1978*

Three patients who underwent superficial temporal-middle cerebral artery anastomosis demonstrated a dissection of the intima of the superficial temporal artery at operation. The fact that this abnormality had not been appreciated previously in surgical series and that it and other anatomical variants may account for “technical failures” of anastomoses is elucidated. The authors describe their successful technique for suturing the intimal flap.

**AB-4572-78**


A young woman suffered a linear skull fracture in an automobile accident and was comatose and hypotensive. Five hours after the injury, a carotid angiogram suggested a 2-mm subdural fluid collection and minimal temporal lobe edema. Twelve hours after the accident, another angiogram was performed because of clinical deterioration, and a large extradural hematoma was discovered and evacuated. There had been laceration of the middle meningeal artery and the transverse sinus. It is postulated that her hypotension had been a protective mechanism preventing active bleeding, and when fluids were administered to increase her blood pressure, the late accumulation of the subdural hematoma occurred.

**AB-4573-78**

Intracranial, Extracerebral Hematomas. Computed Tomographic Appearances — Omar MM (Department of Radiology, State University of New York Upstate Medical Center, Syracuse, New York), Binet EF — *NY State J Med* 78: 207-211 (Feb) 1978

The CT (computerized tomographic) appearance of five epidural hematomas and 25 subdural hematomas is reported. The epidural hematomas all appeared as biconcave masses of increased density beneath the inner table of the temporal bone. The subdural hematomas presented a number of different appearances. A shift of the midline was present in 68%, ventricular asymmetry or deformity in 80%, a peripheral crescent of increased density in 44% (all of whose hematomas were less than ten days old), mixed density or layering in 8%, isodensity with brain in 16% (most of these lesions were 7-21 days old), decreased density in 28% (all chronic), and a membrane which enhanced with contrast in 28%. The usefulness of contrast enhancement is pointed out. Subdurals become isodense with brain after about 14 days and thereafter become less dense.

**AB-4574-78**

Evidence that Neural Mechanisms Do Not Have Important Effects on Cerebral Blood Flow — Heistad DD (Department of Internal Medicine, University of Iowa College of Medicine, Iowa City, Iowa 52242, Marcus ML — *Circulation Research* 42: 295-302 (Mar) 1978

There is dense adrenergic innervation of large brain vessels, but the neuromuscular transmission is unusual, and the arteries are relatively insensitive to norepinephrine. Numerous studies have been done on cerebral blood flow (CBF) before and after neural
ABSTRACTS

537

stimulation. Studies with the microsphere technique indicate no effect, except in severe hypertension. In other studies, less accurate measurements of CBF have been employed. The effect of adrenergic nerves on non-pial cerebral vessels may be to increase capillary permeability rather than CBF. Neural mechanisms may influence CBF under unusual circumstances such as ischemia, subarachnoid hemorrhage, or anesthesia.

AB-4575-78
Recovery From Paraplegia Caused by Spontaneous Spinal Epidural Hematoma — McQuarrie IG (Cornell University Medical College, New York, New York 10021) — Neurology (Minneapolis) 28: 224-228 (Mar) 1978

Three cases of spontaneous spinal epidural hematoma are reported and the findings of 32 from the literature are tabulated. A healthy adult develops sudden back or neck pain, sometimes with neck stiffness, followed over several hours by progressive numbness and weakness. Most are unable to walk after six hours. In some, the onset seems to have been related to the Valsalva maneuver (e.g., coughing) or to the use of anticoagulants. The delay between the event and the time of surgical decompression is a critical factor in the ultimate amount of recovery. In this series, the patients with excellent or good recovery had an average surgical delay of 26 hours, while those who did not recover had an average delay of 48 hours. After a delay of 36 hours, the probability of recovery was less than 50%. In those who ultimately walked, voluntary leg activity began to return in less than two weeks. In those who never recovered, mortality was 40%. Patients who recover probably have developed a demyelinating lesion, while in those without recovery a demyelinating lesion has probably progressed to the point where axons are lost.

AB-4576-78
Transient Spastic Paraparesis Following Abdominal Aortography: Management With Cerebrospinal Fluid Lavage — Morariu MA (Department of Neurology and Neurosurgery, Henry Ford Hospital, Detroit, Michigan 48202) — Ann Neurol 3: 185 (Feb) 1978

After two injections of 35 cc of contrast material (Renografin 76) into the abdominal aorta, a man developed severe spastic paraparesis. Twenty-five minutes later, cerebrospinal fluid lavage was begun by replacing aliquots of CSF with saline. CSF iodine level fell from 17,750 μg per liter to 2,355 μg per liter. Ten milligrams of dexamethasone was administered as well. The patient recovered completely in two hours.

AB-4577-78
Spontaneous, and Postirradiation Complete Regression of Arteriovenous Malformations (AVM) of the Brain Proved by Angiography — Miyazaki M (Department of Neurosurgery, Hiroshima University School of Medicine, Hiroshima, Japan), Shima T, Yokoyama N, Kuwabara S, Sasaki U, Hibino H, Ishikawa S, Uozumi T — Neurol Surg (Tokyo) 6: 195-203 (Feb) 1978

Of 31 cerebral arteriovenous malformations not treated definitively by surgery, two completely regressed, one spontaneously and one following irradiation. The one disappearing spontaneously was known to have bled three time, while the other had been treated with 5,000 rads of 60Co-radiation after bleeding once.

AB-4578-78

Nine of 48 patients undergoing liver transplantation suffered severe neurologic damage and died between three and 72 days after the surgery. All had end-stage liver disease, and three had been comatose, two confused, and one stuporous before the surgery. Six of the patients had a lucid interval after surgery and then deteriorated. Most had seizures, fluctuation in the level of consciousness progressing to coma, and three developed akinetic mutism. Several had focal neurologic signs as well. Pathologic examination of the transplanted livers showed little or no evidence of rejection. Eight brains were examined. Five had multiple small areas of infarction, most commonly in the cerebral cortex and basal ganglia. One patient had large areas of infarction. Five brains showed central pontine myelinolysis with demyelination of pathways in the basal ganglia. Three brains showed the mamillary body changes typical of Wernicke's encephalopathy. All brains demonstrated severe Alzheimer type II astrocytosis. In two there were glial nodules similar to those found in renal transplant patients with cytomegalovirus infection. One brain contained fungal abscesses. Air embolism was definitely implicated in two cases. Further liver transplant operations have been done with precautions to avoid air embolism, and none of the subsequent 14 patients has developed neurologic signs. The right-to-left shunts present in liver disease allow an air embolus from the graft access to the systemic circulation. Nitrous oxide being used for anesthesia could diffuse into the air bubbles and increase their size. Scrupulous attention to preventing air embolism is stressed, and it is suggested that thiamine be administered in the hopes of preventing Wernicke's encephalopathy.

AB-4579-78
Prolonged Antifibrinolysis: An Effective Non-Surgical Treatment for Ruptured Intracranial Aneurysms? —
The outcome of treatment with an antifibrinolytic agent (tranexamic acid) for six weeks after rupture of an intracranial aneurysm was assessed in a randomised controlled trial. Twenty-two out of 25 (88%) treated patients survived at follow-up of three to 33 months compared with 14 out of 25 (56%) control patients. Among the patients who did not undergo operation the survival rate was 81% (13 out of 16) in treated patients and 42% (8 out of 19) in controls.

Antifibrinolytic treatment has so far been seen merely to postpone rebleeding and has been used to enable surgery to be deferred. These findings suggest that tranexamic acid may actually prevent rebleeding without operation. Prolonged antifibrinolysis may therefore prove useful in those patients in good condition whose aneurysms do not lend themselves to surgical obliteration.

**AB-4580-78**
Croma-Memo-Flow Technique for Rapid Sequential Analysis of Regional Cerebral Blood Flow (rCBF) Responses

This is the first report of a method of sequential regional cerebral blood flow (rCBF) analysis, called Croma-Memo-Flow. This technique is a computerized modification of the initial slope method of regional cerebral blood flow (rCBF init.), allowing temporal resolution of the flow pattern by calculation of the slopes of sequential segments of the initial 1-2 minutes of the Xenon-133 washout curve. The same theoretical analysis applies to this method as to the rCBF init. method. Each flow calculation is based on the slope of a discrete 16 second segment of the initial washout; and each second the segment is advanced by one second. A new flow calculation is made each second and is displayed as a color coded map on a TV screen. Each map is labeled, indicating the time in seconds following Xenon injection, and sequential rCBF changes during the clearance period can be immediately visualized. This allows for almost instantaneous analysis and display of rapid or transient rCBF responses to activation and deactivation of the cerebral cortices.

The data is stored in a 35 channel memory for deliberate replay, photography, and analysis. Functional tests may be applied during the initial washout period and both the magnitude and chronological relationships of the evoked regional cerebrovascular responses observed. A clinical study is presented to illustrate the possibilities of applying the technique to assess cortical reactivity.

**AB-4581-78**
Spontaneous Dissection of Cervico-Cerebral Arteries

Sixteen cases of spontaneous dissection of the cervical internal carotid artery (6 verified) are described. The mean age was 45 years. The clinical picture varied from simply headache and a bruit to hemiplegia and aphasia. Eleven patients had transient ischemic attacks. Headache, facial pain, a subjective bruit, oculo-sympathetic palsy and transient monocular blindness were present in various combinations in two-thirds of cases and their presence suggested the correct diagnosis. Examples of suspected dissection of the intracranial internal carotid, middle cerebral, posterior cerebral and extracranial vertebral arteries are also presented. Spontaneous dissection is more common than the literature indicates.

**AB-4582-78**
Microvascular Anastomosis for Cerebral Ischemia in 19 Patients: A Preliminary Report

The general principles of bypass surgery as they affect the cerebral circulation are reviewed. The preliminary results of an extracranial intracranial bypass operation performed on a group of 19 patients suffering from cerebral ischemia are presented. The results of the surgery compare favorably with those published in the literature.

**AB-4583-78**
Brain Metabolism and Arterial Acid-Base Balance Following Bilateral Carotid Occlusion in Normotensive and Experimental Hypertensive Rats

The effects of bilateral common carotid artery occlusion on brain metabolism and arterial acid-base balance were studied in normotensive and experimental renovascular hypertensive rats. One hour after carotid occlusion in hypertensive rats, supratentorial lactate increased to 383% and lactate-pyruvate ratio to 280% of the controls, while adenosine triphosphate (ATP) decreased to 69%. These metabolic changes were thought to be due to cerebral ischemia. Arterial pCO₂ was lowered and the pH was raised in the hypertensive animals due to cerebral ischemia induced hyperventilation. In the normotensive rats, carotid occlusion had minimal effects on cerebral metabolism and arterial acid-base balance.

These results suggest that hypertensive rats are...
ABSTRACTS

539

more susceptible to cerebral ischemia caused by carotid occlusion than normotensive rats. Increased cerebrovascular resistance in hypertension is discussed as a causal factor in cerebral ischemia.

AB-4584-78
Free Percutaneous Embolization of a Traumatic Carotid-Cavernous Fistula — Brunon J (Hôpital Neurologique, B.P. Lyon Montchat, 69394 Lyon Cedex 3, France), Duquesnel J, Fischer G — Neurochirurgie 23: 453-462, 1977*

The authors report the case of an 18 year old patient with a high flow traumatic carotid-cavernous fistula. The carotid angiogram with compression of the ipsilateral internal carotid shows an inversion of the flow at the siphon, all the blood flow passing through the fistula. A free percutaneous embolization of two 30 mm³ fragments of Gelfoam was performed allowing complete obstruction of the fistula and conservation of the carotid flow. The control angiogram showed a false traumatic aneurysm of the supra-cavernous carotid, so a trapping was performed two weeks later.

With this observation, the authors have demonstrated that a free percutaneous embolization was able to occlude a carotid-cavernous fistula with conservation of the carotid permeability. But in a second stage, the discovery of a false traumatic aneurysm in the supra-cavernous carotid made a trapping of the lesion necessary.

The authors point out the conditions required for the realization of this technique: (1) a high flow fistula to direct the Gelfoam embolus through the lesion, (2) an efficient circle of Willis, (3) homolateral carotid compression must reverse the flow through the siphon, (4) an embolus of adequate size in order to avoid its migration up to the cerebral arteries.

Should all these conditions be met, the percutaneous free embolization can be performed, if the occlusion of the fistula cannot be obtained, other techniques remain possible.

AB-4585-78

The effects of chronic hyperammonemia on cerebral metabolism were studied in rats four and eight weeks after the construction of a portacaval shunt. Compared to sham-operated controls, shunted animals had increased arterial concentrations of ammonia and glutamine and decreased glutamate. Cerebral blood flow, measured by xenon 133 washout in animals lightly anesthetized with nitrous oxide, increased from a control of $91 \pm 5$ (mean $\pm$ SEM) to $139 \pm 20$ ml per 100 gm tissue per minute after shunting for eight weeks; however, the cerebral metabolic rate for oxygen was not different from control four or eight weeks after the shunting procedure. Following intraperitoneal administration of a small ammonium acetate load (2.6 mmol/kg), eight-week portacaval animals consistently underwent a fall in cerebral blood flow and cerebral oxygen consumption and developed high-voltage slow waves in the electroencephalogram. Glutamine was produced by the brains of all groups of animals; the cerebral metabolic rate for glutamine was greater than control in eight-week portacaval rats, the only animals to show a net uptake of ammonia into brain. The findings suggest that increased cerebral sensitivity to ammonia, along with nonspecific effects of chronic portal-systemic shunting, may lead to uncoupling of cerebral blood flow and oxidative metabolism.

AB-4586-78

During the 13-year period 1964 through 1976, 37 patients less than 20 years old with an intracranial, parenchymal arteriovenous fistula were seen at the Mayo Clinic. The most frequent mode of presentation was hemorrhage or seizure. Other than angiography, computed tomography with contrast enhancement was the most helpful diagnostic test. Surgery was restricted to patients with intraparenchymal hematomas, intractable seizures, or subarachnoid hemorrhage with accessible lesions and to 1 infant with a massive symptomatic malformation. Surgery generally was tolerated well, with reversal of most acute focal neurological deficits related to hematomas. In the nonsurgical group, follow-up revealed a fairly stable neurological status during the period of the study.

AB-4587-78

Two patients with cerebellar hemorrhage and a benign outcome stress the potential for spontaneous resolution and clinical recovery in some cases of this disorder. In each patient, resolution of the hemorrhage was noted on the computed tomographic scan. Computed tomography may detect a cerebellar hemorrhage even though on clinical grounds a brainstem localization is favored.

AB-4588-78
Observations on Moyamoya Disease: A Case Treated With Superficial Temporal-Middle Cerebral Artery Anastomosis — Boone SC (Department of Surgery,
AB-4589-78  
Effect on Canine Cerebral Blood Flow of Two Common Pressor Agents During Prolonged Halothane Anesthesia — Chikovani O, Corkill G (Department of Neurological Surgery, University of California, Sacramento, California 95817), McLeish I, Ong S, Bellin D — Surg Neurol 9: 211-213 (Mar) 1978* 

Inasmuch as prolonged halothane anesthesia is often associated with hypotension, the effects of pressor agents possibly employed to adjust this hypotension on cerebral blood flow are of interest. In dogs, after prolonged halothane anesthesia, there was a marked difference in the effects of phenylephrine and angiotensin on cerebral blood flow at dosages which promote moderate rises in blood pressure. Phenylephrine had no effect whereas angiotensin had a significantly enhancing effect on cerebral blood flow.

AB-4590-78  
Chronic Intracerebral Hematoma — Yashon D (Division of Neurological Surgery, Ohio State University, Columbus, Ohio 43210), Kosnik EJ — Neurosurgery 2: 103-106 (Mar-Apr) 1978* 

Twelve patients with chronic intracerebral hematoma are reported. This condition may be unrecognized as possibly being benefited by relatively simple diagnostic and therapeutic measures. The neurological symptoms and signs may be acute but may also be intermittent and progressive. The etiology is usually systemic hypertension, but trauma, coagulopathies, and obscure etiologies have been implicated. After diagnosis by computerized tomographic scan and/or arteriography, aspiration of the liquid hematoma usually results in improvement. It is hypothesized that recovery is hastened by removal of the hematoma. Often complete recovery ensues, but mild to severe neurological signs may persist depending on the initial damage.

AB-4591-78  
Cerebral Revascularization: Common Carotid to Distal Middle Cerebral Artery Bypass — Story JL  

(Division of Neurosurgery, University of Texas Health Science Center, San Antonio, Texas 78284), Brown WE Jr, Eidelberg E, Arom KV, Stewart JR — Neurosurgery 2: 131-135 (Mar-Apr) 1978* 

A right common carotid to distal middle cerebral artery bypass utilizing a saphenous vein graft was performed in a patient with episodic cerebral ischemia and reversible ischemic neurological deficit. The patient was relieved of his symptoms, and there was improved motor function in the left hand. Postoperative angiography revealed flow through the graft with excellent filling of the middle cerebral circulation, both retrograde and antegrade. This bypass procedure provided an immediate source of high volume blood flow and thereby provided immediate protection to the hemisphere.

AB-4592-78  
Platelet Aggregation and Cyclic Nucleotide Phosphodiesterase Activity in Arteriosclerotic Patients — Yamazaki H (Division of Cardiology Research, Tokyo Metropolitan Institute of Medical Science, Tokyo 113, Japan), Motomiya T, Mashimo N, Asano T, Hidaka H — Thrombos Haemostas (Stuttg) 39: 158-166 (Feb 28) 1978* 

Although roles of cyclic AMP and cyclic GMP in platelets are thought to be important on platelet aggregation, little information on their phosphodiesterase (PDE) is available. Cyclic AMP and cyclic GMP hydrolytic activities of platelets (cAMPPDE and cGMPDPE in platelets) and platelet aggregation by ADP and adrenaline were measured in 22 healthy volunteers, 26 arteriosclerotic patients and other 20 miscellaneous patients excluding vascular diseases. Activities of cAMPPDE and cGMPDPE of platelets were 2.37 ± 0.52, 7.23 ± 1.84 in the healthy, 2.50 ± 0.85, 7.53 ± 2.60 in the arteriosclerotics and 2.38 ± 1.02, 6.98 ± 2.59 pmol/min/10^7 platelets in the arteriosclerotics and the healthy, respectively. No significant difference was observed among these three groups. Platelet aggregabilities also showed no significant difference. However, there was a significant inverse correlation between the aggregability by 1 μg/ml of adrenaline and the PDE activities only in the arteriosclerotic patients. The correlation coefficients were −0.61 between the primary aggregation and cAMPPDE, −0.65 between the primary aggregation and cGMPDPE, −0.58 between the 5 min aggregation and cAMPPDE and −0.76 between the 5 min aggregation and cGMPDPE. The inverse correlation between platelet aggregation and cyclic nucleotide metabolism in circulating platelets of the arteriosclerotic patients may suggest that interaction of platelets with arteriosclerotic vessel walls would produce a certain change in platelets.

AB-4593-78  
Spontaneous Platelet Aggregation in Cerebrovascular Disease — ten Cate JW (Department of Haematology, Wilhelmina Gasthuis, Amsterdam, The Netherlands), Vos J, Oosterhuis H, Prenger D,
50 patients from a group of 130 patients with transient ischaemic attacks or cerebral infarction were found to demonstrate in vitro spontaneous platelet aggregation (SPA) while 80 normal subjects tested never showed this phenomenon.

The following additional findings point towards a possible platelet abnormality:
1. Platelets from 10 patients with SPA when isolated and resuspended in normal plasma still demonstrated SPA while isolated normal platelets resuspended in patient's plasma did not.
2. Platelets demonstrating SPA showed an increased aggregation tendency upon incubation with ADP while normal platelets developed the expected refractory state.

SPA was found to be dependent upon the presence of divalent cations and could further be inhibited by phentolamine and adenosine. Aspirin effectively abolished SPA in 50 patients and relieved the clinical symptoms of patients with recurrent complaints of transient blindness and paraesthesia.

**ABSTRACTS**

**AB-4594-78**

**Neurogenic Vasodilation of Cat Cerebral Arteries** — Lee TJ-F (Department of Medical Sciences, Southern Illinois University, Springfield, Illinois 62708), Hume WR, Sa C, Bevan JA — *Circulation Research* 42: 535–542 (Apr) 1978*

Transmural nerve stimulation (TNS) with 0.3-msec pulses between 1 and 25 Hz dilated cat cerebral artery segments in the presence of active muscle tone. Maximum vasodilation occurred at 8 Hz. The dilator response to exogenous acetylcholine, but not to TNS, was abolished by atropine. Neither physostigmine nor hemicholinium affected the dilator response to TNS, which persisted after administration of guanethidine, phenoxybenzamine, propranolol, reserpine, and chronic sympathectomy. However, it was abolished by tetrodotoxin and cold storage. When examined histochemically, cat and rabbit cerebral arteries exhibited a rich plexiform distribution of acetylcholinesterase which was not affected appreciably by sympathetically denervation. These results suggest that vasodilation is not mediated through modification of sympathetic activity. They also indicate the existence of a non-adrenergic, possibly noncholinergic, vasodilator innervation in cat cerebral arteries. Preliminary studies suggest that the transmitter is not histamine, APT, prostaglandins, γ-aminobutyric acid, dopamine, or serotonin. The cat cerebral artery segments contrast with the isolated rabbit cerebral arteries which predominantly constrict in response to TNS and show a small dilator response.

**AB-4595-78**


A modified version of an outcomes-oriented quality-assurance system was used to assess the care received by patients, aged 21 to 50 years, with completed stroke, who had participated for at least three weeks in a rehabilitation program. Care for 110 patients was evaluated by comparing actual results with a set of standards for outcomes produced by practicing rehabilitation professionals using small-group estimation techniques. Outcomes were better than estimated, standards having indicated that 29% of patients should be capable of self-care, while actually 43% were. When 50 of the 110 outcomes were individually investigated, only 5% of the total study population were probably not functioning at an optimal level, and 3% more might reach optimal functioning if existing follow-up procedures were extended and made more routine. Since only an estimated 3 to 6 cases per year would be affected, the cost of instituting such care would not be justified. Participants concluded that assessment of outcomes justified continuation of the existing processes for stroke rehabilitation.

**AB-4596-78**

**Stroke Rehabilitation: A Reconsideration of Some Common Attitudes** — Anderson TP (Department of Physical Medicine and Rehabilitation, University of Minnesota, Minneapolis, Minnesota 55455), Kottke FJ — *Arch Phys Med Rehabil* 59: 175–181 (Apr) 1978*

Some common, yet erroneous, attitudes and perceptions about stroke still persist. These warrant reconsideration: (1) benefits of stroke rehabilitation (including validity of its basis, life expectancy, adequacy in nursing homes, outcome prediction, cost benefits, and vocational outcome); (2) gait training (including evaluation methods, gait patterns, hand supports, sensory deficits, and types of braces); (3) effects of training on regaining balance; (4) spasticity (as a negative factor, enhancement by spring-action brace, benefit of inhibition training, and importance of antispasmodic drugs); (5) danger of early activity; (6) depression; (7) effects on patients’ sexuality; (8) effects of communication impairments on learning abilities as well as effectiveness of speech therapy; (9) application of neurophysiologic principles (regarding decreasing synaptic resistance, applications of principles from cerebral palsy training, and benefits of training for percept-concept-motor function deficits); and (10) research including reliability of past reports and paucity of facilities for new research.

**AB-4597-78**

**Platelet Aggregation in Patients With Severe Atherosclerosis** — Olcott C IV, (Department of
Platelet function was tested in patients with severe atherosclerosis, mild atherosclerosis, and in age-matched controls. Platelet aggregation was stimulated in vitro by epinephrine, ADP, and collagen. Mean platelet aggregation was significantly increased in patients with severe atherosclerosis. Four of the severely affected patients suffered thrombosis of a vascular reconstruction within 24 hours of surgery. In patients with severe atherosclerosis, perhaps antiplatelet drugs should be given prior to vascular surgery.

Experiences of Surgical Treatment of 400 Consecutive Ruptured Cerebral Arterial Aneurysms — Bohn E (Department of Neurosurgery, University Hospital, Uppsala, Sweden), Hugosson R — *Acta Neurochir (Wien)* 40: 33-43, 1978

Four hundred of 580 patients with ruptured intracranial aneurysms underwent surgery. The cerebral circulation was evaluated preoperatively by a 99-Tc pertechnetate flow study, and surgery was usually postponed until this was normal, usually in the middle of the second week. Most aneurysms were clipped without microsurgery. When clipping was impossible, the aneurysm wall was coated with adhesive. Botterell’s clinical classification was employed in dividing the patients into groups I-V. Patients in Botterell groups I and II operated before the 11th day had an operative mortality of 8% and an operative morbidity of 10%. Those operated after the 11th day had a mortality of 2.3% and a morbidity of 3.6%. In younger patients (< 40 years old), the mortality was 0 and the morbidity was 3%. Thirty-four patients underwent emergency surgery, either because of an intracerebral hematoma or for repeated bleeding. Most were in the Botterell group IV-V, and operative mortality was 50%. Ninety percent of all carotid and pericallosal artery aneurysms were successfully clipped, as were 71% of the middle cerebral and anterior communicating, and 50% of the vertebral/basilar artery aneurysms. Postoperative hemorrhage occurred in 12 patients, all of whose aneurysms had been reinforced with plastic coating. Ten of the rebleeds occurred in the first two years.

Angiographic spasm was present on days four to seven in 40% of patients with carotid or middle cerebral aneurysm and was still present after eight to 11 days in 30%. Eighty-eight percent of the patients in groups I and II achieved a satisfactory result. Twelve were disabled, six as a result of the hemorrhage. Fifty-five percent of the group III patients are able to work. Vascular spasm is a major cause of mortality and morbidity.


Six patients with epilepsy were found to harbor large middle cerebral artery aneurysms. Two had curvilinear calcification skull x-ray and four had focally abnormal electroencephalograms. The epileptic focus could be produced either by a small hemorrhage with local necrosis of brain tissue or by the aneurysm wall behaving like a hamartoma. Aneurysm should be considered in the differential diagnosis of epilepsy and should be ruled out before a surgical attempt is made to extirpate a focus.


Two cases are reported of patients who died after their intracranial aneurysms were clipped. The role of postoperative vasospasm is discussed, and the angiographic and neuropathologic findings are reviewed.


Cavernous angiomas of the brain are much rarer than racemose vascular malformations. The literature is reviewed and 14 new cases are described. Cavernous angiomas may be hereditary. They are composed of sinusoidal vascular spaces without intervening brain tissue and lacking smooth muscle or elastic tissue. Calcium, bony trabeculae, and hemosiderin may be found in their walls. They may be surrounded by gliosis. The x-ray appearance is often that of an avascular mass.

Cavernous hemangiomata can be associated with epilepsy, subarachnoid hemorrhage, headache, or focal neurologic deficit, and usually occur in the supratentorial white matter, where 40% produce calcifications visible on x-ray. Surgical removal is usually successful and technically easy.


The operative approach to seven deep midline angiomas of the brain is described. Simultaneous angiography and pneumoencephalography were employed where indicated to demonstrate the relationship of the malformation to the ventricle. All
of the patients had presented with subarachnoid hemorrhage in the second or third decade. The angioma included the ventricular wall in five cases. Surgical extirpation was possible in six patients. In three, postoperative hydrocephalus required treatment. Six are working and symptom-free.

**AB-4603-78**

**Spontaneous Carotid-Cavernous Fistula With Fibromuscular Dysplasia** — Kaufman HH (Division of Neurosurgery, University of Texas Medical School, Houston, Texas 77030), Lind TA, Mullan S — *Acta Neurochir (Wien)* 40: 123–129, 1978

A 31-year-old woman with fibrous dysplasia of both carotid arteries and the vertebral, splenic, hepatic, renal and iliac arteries developed a spontaneous right carotid-cavernous fistula. It was feared that obliteration of the right carotid would increase the flow in the diseased left carotid and produce another fistula, and surgery was postponed. Increasing symptoms (diplopia, proptosis) necessitated surgery, and the cavernous sinus was then obliterated with bronze wire, with improvement of symptoms.

**AB-4604-78**


In a canine model, thrombi were caused to form in the carotid arteries in the neck, and I-131 fibrinogen was used to demonstrate the thrombi. The labelled fibrinogen was produced by the Hunter-Greenwood procedure, a modified Hunter-Greenwood procedure, or by the iodine monochloride method. There was a high uptake of the products into the thrombi, independent of the amount of tracer. The product of an alternate Hunger-Greenwood procedure had twice the specific activity of the other two, however, it was cleared more quickly; this technique might allow more rapid and higher contrast imaging of thrombi.

**AB-4605-78**

**Scintigraphic Detection of Congenital Intracranial Vascular Malformations** — Gates GF (Division of Nuclear Medicine, Children's Hospital of Los Angeles, Los Angeles, California 90054), Fishman LS, Segall HD — *J Nucl Med* 19: 235–244 (Mar) 1978

Nine children had cerebral arteriovenous malformations (AVMs) and one had an aneurysm. Dynamic scintigraphy revealed all ten of the lesions, while contrast-enhanced computerized tomographic (CT) scanning missed two of the AVMs, and delayed scintigraphy missed two AVMs and the aneurysm. Using dynamic scintigraphy, it was possible to produce curves showing what percent of blood flow went to which hemisphere and how much was diverted into the AVM. The direction of venous drainage was also detected. Dynamic scintigraphy is less costly than CT and does not require heavy sedation.

**AB-4606-78**

**Embolism in Sinoatrial Disease** — Bathen J (Section of Cardiology, Regional Hospital, University of Trondheim, Trondheim, Norway), Sparr S, Rokseth R — *Acta Med Scand* 203: 7–11, 1978

Two hundred and thirty-eight patients with sinoatrial disease received pacemakers and were followed for an average of 39 months. Those in group A had paroxysmal tachycardia, those in group B did not, and those in group C had atrioventricular block. Thirty-five percent of those in group A suffered sudden vascular events compatible with embolization. Almost all of these were cerebrovascular. Seven percent of those in group B and 10% of those in group C suffered vascular events as well. The three groups were similar with respect to age and the presence of underlying disease. Most episodes of embolization took place after pacemaker implantation. Anticoagulant therapy for patients with alternating bradycardia and tachycardia should be considered.

**AB-4607-78**

**Electroencephalographic Prediction of Anoxic Brain Damage After Resuscitation From Cardiac Arrest in Patients With Acute Myocardial Infarction** — Møller M (Department of Medicine B, Odense University Hospital, Odense, Denmark), Holm B, Sindrup E, Nielsen BL — *Acta Med Scand* 203: 31–37, 1978

One hundred and eighty-five patients who had had a cardiac arrest following an acute myocardial infarction had electroencephalograms (EEG) done, and the EEG was graded from I-V. Eighty-nine survived the cardiac arrest and 96 died, 76 from anoxic cerebral damage. Of the survivors, 18 had anoxic brain damage. Seventy of 72 with an initial EEG of grades III-V died, while none with a grade I EEG died. Some survivors with EEGs of grade I or II had permanent sequelae. While an EEG of grade III-V recorded 24 hours after the event indicates the patient will not survive, the extent of sequelae cannot be predicted from a single EEG.

**AB-4608-78**

**Hypoglossal Paralysis Due to Compression by a Tortuous Internal Carotid Artery in the Neck** — Scotti G (Neurological Clinic, University of Milan, 1-20111 Milano, Italy), Melancon D, Olivier A — *Neuroradiology* 14: 263–265 (Feb 17) 1978

Severe hemiatrophy of the right half of the tongue in a 22 year old patient was demonstrated to be due to compression of the hypoglossal nerve by a tortuous internal carotid artery in the neck. The nerve was trapped between an abnormal loop of the internal carotid artery and the sternocleidomastoid branch of
the occipital artery. Although impairment of cranial nerve function with cases of tortuous and dilated vessels has been reported frequently, twelfth nerve palsy has never been demonstrated before.

**Items of Interest**

**Hypertension in Children: Recommendations** — McVicar M (Children's Kidney Program, North Shore University Hospital, Manhasset, New York) — *NY State J Med* 78: 791-794 (Apr) 1978

**Classification of Aneurysms of the Internal Carotid System** — Pia HW (Department of Neurosurgery, University of Giessen, Federal Republic of Germany) — *Acta Neurochir (Wien)* 40: 5-31, 1978

**Symposium on Cerebral Blood Flow** — Shapiro HM (Department of Anesthesiology, University of California, San Diego, California) — *Anesthesiology* 48: 131-133 (Mar) 1978

This is an excellent short summary of the Eighth International Cerebral Blood Flow Symposium (Copenhagen, June 1977). Contemporary views on neurogenic control, autoregulation, metabolic control, biogenic amines, barbiturate therapy, and incomplete versus complete ischemia are reviewed. Abstracts and poster presentations of the conference are contained in Ingvar DH, Lassen NA’ (Eds.): Cerebral Function, Metabolism and Circulation: *Acta Neurol Scand* Vol 56; Suppl 64, 1977

Review of 450 cases.
AMERICAN HEART ASSOCIATION
1978 SUBSCRIPTION RATES

CIRCULATION
A monthly devoted to clinical research and advances in the cardiovascular field. Elliot Rapaport, M.D., Editor

<table>
<thead>
<tr>
<th></th>
<th>U.S.</th>
<th>Elsewhere</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$25</td>
<td>$30</td>
</tr>
</tbody>
</table>

CIRCULATION RESEARCH
A monthly concerned with basic research in the cardiovascular field. Brian F. Hoffman, M.D., Editor

<table>
<thead>
<tr>
<th></th>
<th>U.S.</th>
<th>Elsewhere</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$50</td>
<td>$55</td>
</tr>
</tbody>
</table>

STROKE
A journal of cerebral circulation, bi-monthly. Fletcher McDowell, M.D., Editor

<table>
<thead>
<tr>
<th></th>
<th>U.S.</th>
<th>Elsewhere</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$25</td>
<td>$30</td>
</tr>
</tbody>
</table>

RECURRING BIBLIOGRAPHY
OF HYPERTENSION
Bi-monthly, in cooperation with the National Library of Medicine.

<table>
<thead>
<tr>
<th></th>
<th>U.S.</th>
<th>Elsewhere</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$12</td>
<td>$16</td>
</tr>
</tbody>
</table>

Publishing Office
AMERICAN HEART ASSOCIATION
7320 Greenville Ave.
Dallas, Texas 75231
Abstracts

Stroke. 1978;9:525-544
doi: 10.1161/01.STR.9.5.525

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://stroke.ahajournals.org/content/9/5/525.citation

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Stroke can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to Stroke is online at:
http://stroke.ahajournals.org/subscriptions/