AB-3098-77
Brain-Type Creatine Kinase Isoenzyme. Occurrence in Serum in Acute Cerebral Disorders — Kaste M (Department of Neurology, University of Helsinki, SF-00290 Helsinki 29, Finland), Somer H, Konttinen A — Arch Neurol 34: 142-144 (Mar) 1977*

Acute brain damage — cerebrovascular or cardiovascular, traumatic or infectious — released brain-type isoenzyme of creatine kinase (BB-CK) into the circulation within a few hours in 16 of 62 patients (26%). Occurrence of BB-CK was transient in the serum. BB-CK activity was found in the peripheral blood in 13 of 23 patients with diffuse brain damage compared to three of 39 patients with a local cerebrovascular accident (P < .0005). The mortality of patients having BB-CK in their serum was 63% compared to 39% of those without BB-CK activity in their serum (P < .05).

AB-3099-77
Doppler Ultrasound Scanning of the Carotid Bifurcation — Blackwell E, Merory J, Toole JF (Department of Neurology, Bowman Gray School of Medicine of Wake Forest University, Winston-Salem, North Carolina 27103), McKinney W — Arch Neurol 34: 145-148 (Mar) 1977*

The results of Doppler scanning of 146 carotid bifurcations in 86 patients were correlated with carotid arteriography. The correlations for normal carotid arteries ranged from 63% to 98%; the correlation for occlusions of carotid arteries was 100%. The Doppler scan correlated in 70% to 85% of stenoses of the internal or external carotid arteries near their origins. The technique may be performed by a well-trained technician or physician.

AB-4000-77
Symptomatic Intracranial Steal — Hachinski V (Division of Neurology, Sunnybrook Medical Center, Toronto, Ontario M4N 3M5, Canada), Norris JW, Cooper PW, Marshall J — Arch Neurol 34: 149-153 (Mar) 1977*

The phenomenon of shunting of blood in association with various intracranial lesions is well known; however, usually clinical symptoms are attributable to the lesion and not to the redistribution of regional cerebral blood flow (rCBF).

We report three patients investigated by angiography and rCBF studies in whom symptoms appeared to be due to a hemodynamic steal within one cerebral hemisphere, between hemispheres, and from the brain into a tumor, respectively.

AB-4001-77

An analysis has been made of the clinical manifestations in 18 cases of hypertensive thalamic hemorrhage diagnosed by computed tomography (CT). CT scans permitted accurate determination of the site, size, and extension of the hemorrhages. A sensorimotor hemiplegia or hemiparesis was present in all cases. Diagnostic clinical features included limitation of vertical gaze, downward deviation of the eyes, and small unreactive or sluggish pupils. All hemorrhages larger than 3.3 cm in diameter were fatal.

AB-4002-77
Mycotic Cervical Carotid Aneurysm — Howell HS (Suite 116, 624 Quaker Lane, High Point, North Carolina 27262), Baburao T, Graziano J — Surgery 81: 357-359 (Mar) 1977*

A case of ruptured mycotic aneurysm involving the extracranial carotid artery is presented. Klebsiella was found to be the responsible pathogen. Carotid artery mycotic aneurysms are discussed with emphasis on the dilemma of surgical treatment. After aneurysm resection the carotid flow either must be re-established or the carotid vessels ligated. A review of the literature reveals that the majority of grafts or arterial repairs fail if reconstruction is carried out in an infected field. The consequences of acute carotid artery ligation are reconsidered.

AB-4003-77
Responses of the Cerebral Circulation to Hypercapnia and Hypoxia After 7th Cranial Nerve Transection in Baboons — Hoff JT (Wellcome Surgical Research Institute, University of Glasgow, Glasgow G61 1QH, Scotland), MacKenzie ET, Harper AM — Circulation Research 40: 258-262 (Mar) 1977*

It has been proposed that the responses of the cerebral circulation to hypoxia, hypercapnia and hypotension may be partially mediated by an autonomic reflex with receptors in the carotid body or sinus serving as sensors and the efferent limbs being the 7th cranial nerves. Transection of the 7th cranial nerve has been reported to impair the cerebral circulatory response to isolated chemoreceptor stimulation by hypoxia and hypercapnia. To test this hypothesis we measured cerebral blood flow (CBF) by an intra-arterial 133Xe technique in 10 baboons during periods of induced hypoxia and hypercapnia, both before and after transection of the 7th cranial nerve. We found that the responses of CBF were unaltered by either unilateral or bilateral section of the nerve. Our results showing the preservation of normal CBF responses, following transection, suggest that neurogenic control of the cerebral circulation by an autonomic reflex involving the 7th nerve is unlikely.

AB-4004-77
Platelet Aggregation in the Cerebral Microcirculation. Effect of Aspirin and other Agents — Rosenblum WI (Division of Neurpathology, Medical College of Virginia, Richmond,
beta-adrenergic blocking agent propranolol, but not to headache. The patients responded to treatment with the neck and probably is the cause of this dysautonomic

Anterior neck injury occurred in all patients. The third was no evidence of generalized autonomic dysfunction. of the affected pupil during headache-free intervals. There — Vijayan N (Department of

vascular headaches localized to an area of a major collateral and paroxysmal hypertensive attacks associated with ipsilateral mydriasis and facial hyper-

Regional cerebral blood flow (rCBF) was investigated in 12 patients with brain tumors, using a 254-channel dynamic gamma camera. In nine of the 12 cases, hyperemic regions with loss of autoregulation were seen in sites remote from the tumor (the area around the tumor was in most cases also hyperemic). These remote rCBF abnormalities were found in the lower posterior part of the hemisphere in six cases, and in the frontal region in three. The location of the remote rCBF abnormality seemed to depend on the site of the tumor: cases with frontal and posterior fossa mass lesions had hyperemia in the lower part of the temporooroccipital regions, cases with centroparietal mass lesions had hyperemia mostly in the frontal region. This may mean that the remote rCBF abnormality is due to local tissue compression against unyielding anatomical structures, namely, the tentorium and the falx. It is suggested that these abnormalities may constitute evidence of an early stage of a dangerous clinical condition: a state of preherniation.

Clinical and therapeutic observations are described in seven patients with a new form of post-traumatic headache. Unilateral fronto-temporal vasodilatory headaches occurred associated with ipsilateral mydriasis and facial hyperhidrosis followed by partial ptosis and meiosis. Pharmacologic studies showed partial sympathetic denervation of the affected pupil during headache-free intervals. There was no evidence of generalized autonomic dysfunction. Anterior neck injury occurred in all patients. The third neuronal sympathetic pathway appears partially damaged in the neck and probably is the cause of this dysautonomic headache. The patients responded to treatment with the beta-adrenergic blocking agent propranolol, but not to ergotamine.

ABSTRACTS


AB-4007-77
Migraine Stupor — Lee CH, Lance JW (Division of Neurology, The Prince Henry Hospital, Little Bay, N.S.W. 2036, Australia) — Headache 17: 32–38 (Mar) 1977*

Seven patients aged 10–52 years have had stupor lasting 2 hours to 5 days during attacks of migraine. Commonly associated symptoms included dysarthria, ataxia, incoordination, paraesthesiae, dilation of one pupil and homonymous hemianopia which point to the vertebrobasilar arterial tree as the site of disturbance. Vasoconstriction in this circulation appears to be the most likely mechanism.

Aggressive and apparently hysterical behavior was a feature of the attack in 4 patients.

AB-4008-77
Regional Cerebral Blood Flow Alterations Remote From the Site of Intracranial Tumors — Endo H, Larsen B, Lassen NA (Department of Clinical Physiology, Bispebjerg Hospital, DK-2400 Copenhagen NV, Denmark) — J Neurosurg 46: 271–281 (Mar) 1977*

Regional cerebral blood flow (rCBF) is a dangerous clinical condition: a state of preherniation.

AB-4009-77

The authors conducted quantitative analysis of computerized tomography (CT) scans to measure tumor size, cerebral edema, and regional blood volume in man. Mass lesions without edema caused a local reduction in blood volume. Cerebral edema also reduced blood volume in proportion to its severity. Consideration of the electrolyte changes and water shifts in white-matter edema suggested that the decrease in absorption coefficient seen in CT scans was due to the increase in water content. Thus, in cerebral edema separation of blood vessels as well as increased interstitial pressure decrease blood volume, and the regional differences in turn reflect pressure gradients within the brain.

AB-4010-77
Ruptured Intracranial Aneurysms. Case Morbidity and Mortality — Post KD, Flamm ES (Department of Neurosurgery, New York University Medical Center, New

*Authors' abstract
The authors review 100 consecutive cases of ruptured intracranial aneurysms to assess the overall morbidity and mortality. Patients were placed on a regimen of bed rest, sedation, control of blood pressure, anticoagulants, and antifibrinolytic therapy. Surgery was performed on 86 patients with symptomatic aneurysms and microsurgical techniques. The incidence of early rebleeding while on epsilon aminocaproic acid and control of blood pressure was 11.8%. The overall surgical mortality was 8.1%, and the surgical mortality of patients in Grades 1, 2 and 3 was 6.3%. Of the 100 patients, 60 were able to return to their prior activities, and 25 had moderate neurological deficits that required limitation of their activities. The total case mortality was 15%. The evidence presented indicates that the regimen of active medical treatment before microsurgical intervention has improved the overall case morbidity and mortality, as well as the chance for long-term survival.

**AB-4011-77**

Cerebrovascular Sensitivity to Vasoconstricting Agents Induced by Subarachnoid Hemorrhage and Vasospasm in Dogs — Toda N (Department of Pharmacology, Shiga University of Medical Sciences, Ohtsu 520-21, Japan), Ozaki T, Ohta T — *J Neurosurg* 46: 296-303 (Mar) 1977*

In anesthetized dogs, subarachnoid hemorrhage (SAH) was induced by the mechanical rupture of the unilateral intracranial internal carotid artery. Vasospasm was angiographically determined 24 hours and 7 days after SAH. Contractile responses to serotonin, norepinephrine, histamine, and K+ were compared in control and bleeding sides of the middle cerebral arteries removed from dogs with SAH, and from sham-operated dogs. Under sham operation and 2 hours after SAH, responses in the arteries of both sides did not appreciably differ but response was significantly less in arteries from the bleeding side as compared with the control side 24 hours and 7 days after hemorrhage. However, median effective concentrations of serotonin, histamine, and K+ were approximately the same in the arteries from both sides. Vasospasm and decreased sensitivity to the vasoactive agents of middle cerebral arteries were reversed 42 days after SAH. It is thus quite likely that initiation and maintenance of post-hemorrhage vasospasm is not associated with an increase in the sensitivity of cerebral arteries to vasoconstricting endogenous substances, rather the state of decreased sensitivity of cerebral arteries in contact with SAH may be instrumental in relieving prolonged vasospasm.

**AB-4012-77**


Spinal cord blood flow (SCBF) was measured over a wide range of artificially varied mean systemic arterial blood pressures (MAP) in a group of monkeys with alpha adrenergic receptors blocked by the intravenous administration of phenoxybenzamine (Dibenzyline). The SCBF was found to vary linearly with changes in MAP. Autoregulation appeared to have been abolished. These data are cited as evidence for a dominant role of the sympathetic nervous system in control of the spinal circulation.

**AB-4013-77**

Norepinephrine Levels in Experimental Spinal Cord Trauma. Part 1: Biochemical Study of Hemorrhagic Necrosis — Rawe SE (Division of Neurosurgery, Medical University Hospital, Charleston, South Carolina 29401), Roth RH, Boodle-Biber M, Collins WF — *J Neurosurg* 46: 342-349 (Mar) 1977*

Levels of norepinephrine (NE) in the spinal cord tissue of nontraumatized cats are highest in the cervical and lumbar enlargements. A rather uniform but slightly increasing concentration gradient from cephalad to caudad is observed in the thoracic segments. A 500 gm-cm trauma at the T-5 or C-7 spinal cord segment did not demonstrate any significant increase in NE levels measured sequentially over a 4-hour period after trauma. Dopamine levels could not be detected in the nontraumatized or traumatized cat spinal cords. Four traumatized cats treated with alpha methyl tyrosine, a tyrosine hydroxylase inhibitor, and followed clinically for 5 months showed no improvement in neurological function when compared to untreated traumatized cats. This study does not support the norepinephrine hypothesis of experimental spinal cord trauma.

**AB-4014-77**

Norepinephrine Levels in Experimental Spinal Cord Trauma. Part 2: Histopathological Study of Hemorrhagic Necrosis — Rawe SE (Division of Neurosurgery, Medical University Hospital, Charleston, South Carolina 29401), Roth RH, Collins WF — *J Neurosurg* 46: 350-357 (Mar) 1977*

Alpha methyl tyrosine (AMT) or reserpine administered intravenously 24 hours before sacrifice in the nontraumatized cat resulted in significant reduction in tissue levels of norepinephrine (NE) tested at the T-5 spinal cord level. Phenoxybenzamine given 2 hours before sacrifice did not alter NE levels at T-5. Histological sections of spinal cord examined 1 hour after a 500 gm-cm trauma at the T-5 level in cats, pretreated 24 hours before trauma by a single dose of AMT or reserpine, demonstrated no reduction of gray or white matter hemorrhages when compared to controls. In cats pretreated with phenoxybenzamine 2 hours before trauma there was a marked reduction of hemorrhages at 1 hour posttrauma when compared to controls. The animals treated with phenoxybenzamine had a 32% reduction of systemic blood pressure before trauma, demonstrated no pressor response to spinal cord trauma, and were severely hypotensive posttrauma. It is concluded that posttraumatic blood pressure has greater etiological significance in the pathogenesis of experimental spinal cord hemorrhages than tissue levels of NE.

**AB-4015-77**

Headaches Related to Sexual Activity — Lance JW (Division of Neurology, The Prince Henry Hospital, Sydney,
ABSTRACTS

AB-4016-77
Large Cerebral Vessel Disease in Sickle Cell Anaemia — Boros L, Thomas C, Weiner WJ (Division of Neurology, Michael Reese Hospital and Medical Center, Chicago, Illinois 60616) — J Neurol Neurosurg Psychiatry 39: 1236-1239 (Dec) 1976*

An 18-year-old male with documented sickle cell disease was admitted to the hospital for the final time in coma. Cerebral angiography revealed multiple stenotic lesions of the large cerebral vessels. The pathology of this large vessel involvement is demonstrated and the potential contribution of large as opposed to small cerebral vessel disease in the neurological manifestations of sickle cell anaemia is discussed.

AB-4017-77
Cerebral Cortical Changes in Acute Experimental Hypertension. An Ultrastructural Study — Nag S, Robertson DM (Department of Pathology, Queen’s University, Kingston, Ontario K7L 3N6, Canada), Dinsdale HB — Lab Invest 36: 150-161 (Feb) 1977*

Multiple focal cortical areas of increased vascular permeability to tracer substances occur in experimental hypertensive encephalopathy. In this study, rats with angiotensin-induced acute hypertension were used to determine whether increased permeability was associated with focal cerebral edema and if so, the tissue component involved. In addition, the mechanism of increased permeability and the types of vessels involved were investigated using horseradish peroxidase as a tracer.

AB-4018-77
External Carotid-Vertebral Artery Anastomosis for Vertebrobasilar Insufficiency — Corkill G (Department of Neurological Surgery, University of California, Davis-Sacramento Medical Center, Sacramento, California 95817), French BN, Michas C, Cobb CA III, Mims TJ — Surg Neurol 7: 109-115 (Mar) 1977*

Two patients with previous brain stem infarction and current symptoms of vascular insufficiency in the basilar circulation had evidence of vertebral artery occlusive disease. Angiography demonstrated ostial stenosis of the dominant right vertebral artery and retrograde flow down the left vertebral artery to the level of the transverse process of C2 in the first case and to the level of a severely stenosed origin in the second case. Carotid circulation was patent in both cases. The blood flow in the posterior circulation was augmented by extracranial anastomosis of the external carotid artery to the vertebral artery in the foramen transversarium at the level of Cl-2 by a lateral approach in Case 1 and at the level of C4-5 by an anterior approach in Case 2. Postoperative improvement in neurologic status occurred in both cases.

AB-4019-77
Balloon Occlusion and Embolization of an Internal and External Carotid-Cavernous Fistula — Fleischer AS (Division of Neurosurgery, Grady Memorial Hospital, Atlanta, Georgia 30303), Berg DJ — Surg Neurol 7: 145-148 (Mar) 1977*

Interventional neuroradiologic treatment of an unusual carotid-cavernous sinus fistula filling from both the external and the internal carotid artery in a 28-year-old female is reported. Fogarty balloon occlusion of the internal carotid artery via cervical percutaneous puncture and Gelfoam embolization of external branches were carried out under angiographic control.

Twenty-one patients experienced headache related to sexual activity. Two varieties of headache could be distinguished from the clinical histories. The first, developing as sexual excitement mounted, had the characteristics of muscle contraction headache. The second, severe, throbbing or "explosive" in character, occurring at the time of orgasm, was presumably of vascular origin associated with a hyperdynamic circulatory state. Two of the patients with the latter type of headache had each experienced episodes of cerebral vascular insufficiency on one occasion which subsequently resolved. A third patient in this category had a past history of drop attacks. No evidence of any structural lesion was obtained on clinical examination or investigation, including cerebral angiography in seven patients. Eighteen patients have been followed up for periods of two to seven years without any serious intracranial disorder becoming apparent. While the possibility of intracranial vascular or other lesions must always be borne in mind, there appears to be a syndrome of headache associated with sexual excitement where no organic change can be demonstrated, analogous to benign cough headache and benign exertional headache.

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Quantitative morphometric studies 8 minutes after the onset of hypertension demonstrated significant perivascular gial swelling around arterioles, venules, and capillaries; the swelling was confined to the permeable areas and absent in the nonpermeable areas of the same animals.

Ninety seconds after the onset of hypertension, horseradish peroxidase reaction product was present in focal superficial segments of the walls of penetrating arterioles but rarely in venular and capillary walls. At this time period endothelial cells showed prominent pinocytotic uptake of tracer. Eight minutes after the onset of hypertension, reaction product was again found in arteriolar walls and had extravasated into the surrounding extracellular space of the neuropil as well. Extravasation also occurred through capillary and venular walls but was less frequent. At this time interval endothelial pinocytotic activity was still prominent.

There was no mechanical damage of vessel walls in the form of endothelial discontinuities or disruption of interendothelial spaces. Tracer was not found in interendothelial junctions in continuity from lumen to base. The principle mechanism of increased permeability was enhanced pinocytosis, which occurred rapidly, being demonstrable 90 seconds after the onset of hypertension; it was observed principally in permeable arteriolar segments.

AB-4018-77
External Carotid-Vertebral Artery Anastomosis for Vertebrobasilar Insufficiency — Corkill G (Department of Neurological Surgery, University of California, Davis-Sacramento Medical Center, Sacramento, California 95817), French BN, Michas C, Cobb CA III, Mims TJ — Surg Neurol 7: 109-115 (Mar) 1977*

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*Authors’ abstract
Computed Tomography in Intracranial Arteriovenous Malformations — Terbrugge K, Scotti G, Ethier R (Department of Radiology, Montreal Neurological Hospital, Montreal, Quebec H3A 2B4, Canada), Melancon D, Tchang S, Milner C — Radiology 122: 703–705 (Mar) 1977*

22 patients with proved intracranial arteriovenous malformations (AVM) were studied by computed tomography (CT). Of these, 18 were also studied by CT after intravenous injection of contrast material. The plain scan was normal in 23% of cases. A combination of plain and contrast-enhanced CT proved to be superior to other screening techniques in patients with a possible intracranial AVM.

Ring Blush Associated With Intracerebral Hematoma — Zimmerman RD (Department of Radiology, Albert Einstein College of Medicine, Montefiore Hospital and Medical Center, Bronx, New York 10467), Leeds NE, Naidich TP — Radiology 122: 707–711 (Mar) 1977*

Seven cases of ring blush following spontaneous and post-traumatic subacute and chronic intracerebral hematoma are presented. As such a hematoma ages, a ring blush may be seen following contrast-agent enhancement. Serial CT demonstrates disappearance of the ring blush from two to six months after the first scan. The CT appearance of the ring blush is not specific for hematoma, but its peripheral location and lack of mass effect may be considered suggestive of hematoma with appropriate clinical findings. The characteristic serial changes permit correct diagnosis without surgical intervention in most cases.

Basilar Artery Ectasia Demonstrated by Computed Tomography — Peterson NT (Department of Radiology, Cleveland Clinic Foundation, Cleveland, Ohio 44106), Duchesneau PM, Westbrook EL, Weinstein MA — Radiology 122: 713–715 (Mar) 1977*

Basilar artery ectasia was demonstrated by computed tomography (CT) in 4 cases. The course and diameter of the basilar artery as seen by CT closely approximated those aspects of the artery visualized by angiography. The clinical manifestations of basilar ectasia correlated with what brain stem structures were impinged upon by the ectatic artery.

Internal Carotid Artery Blood Flow During Cerebral Angiography — Nornes H (Department of Neurosurgery, National Hospital of Norway, Rikshospitalet, Oslo, Norway) — Neuroradiology 12: 219–225 (Feb 25) 1977*

A total of 13 contrast injections of Isoopaque Cerebral (meglumine metrizoate) were made into the precerebral arteries or the aortic arch in 6 patients and the bilateral internal carotid artery blood flow monitored continuously using implanted electromagnetic blood flow probes. The most frequent causes of flow changes were found to be due to sudden changes in arterial blood pressure or ventilation which caused a simultaneous and generally identical flow pattern in the two arteries. In 4 patients a slight increase in flow in the artery receiving contrast medium was observed; the increase ranged from 10 to 20% above control level. In one patient the ICA receiving contrast medium showed an initial drop in blood flow to about 85% within 15 sec while the contralateral side showed an increase in flow to about 110%. This sequence was followed by a 6 minute period of slightly increased blood flow on the injection side while the other side showed a slight decrease. A discrepancy in carotid vasomotor response was seen after the injection of 50 ml of contrast medium into the aortic arch with filling of both carotids in the angiogram. Flow changes thought to reflect "arterial spasm" (increased vascular resistance) were observed during attempts to puncture the common carotid artery. The risks connected with this method are discussed. Repeat flow recordings throughout the 24 hours following angiography did not show flow changes attributable to the angiographic investigation.

Arteriography of the Anterior Communicating Aneurysm — Kamisasa A (Department of Neurosurgery, Saitama Medical School, Moro, Saitama-ken, Japan) — Neuroradiology 12: 227–232 (Feb 25) 1977*

Optimal projections for the delineation of anterior communicating aneurysms were investigated by means of model experiments and the results applied to 30 clinical cases. The oblique half-axial, the oblique orbital, the full axial, and the reverse oblique projections proved useful adjuncts to conventional projections in studying the anterior communicating aneurysm.


Treatment of patients with prosthetic valve endocarditis with existing guidelines has failed to reduce the over-all mortality rate to below 50 per cent. However, subgroups with high or lower risk of death can be delineated on the basis of risk factors such as early onset following surgery, high-risk causative organisms, cardiodynamic failure, and septic emboli. High-risk patients comprise more than 70 per cent of those with prosthetic valve endocarditis in recent series. Analysis of previously reported series indicates that the mortality rate for high-risk patients with late onset of prosthetic valve endocarditis treated by valve replacement was less than that of patients receiving only medical therapy. We have treated 6 consecutive patients with prosthetic valve endocarditis (3 early onset, 3 late onset) by valve replacement before completion of a course of antibiotics. All patients survived surgery but one patient died after 4½ months of noninfectious causes. Prompt valve replacement is technically feasible and should become the standard therapy for patients with prosthetic valve endocarditis who do not fall into the lower risk group.
New York 10021), Aberfeld DC — Arch Neurol 34: 251-252 (Apr) 1977*

A case of a spontaneous dissecting aneurysm of the left internal carotid artery in a 48-year-old woman was treated by endarterectomy. We review the literature and discuss the pathogenesis.

AB-4027-77
Intracranial Cavernous Angioma — Bartlett JE (Department of Diagnostic Radiology, Lester E. Cox Medical Center, Springfield, Missouri 65802), Kishore PRS — Am J Roentgenol 128: 653-656 (Apr) 1977*

Cavernous angiomas are a rare but important clinical entity because of their potential curability. Three patients who had intracranial cavernous angiomas confirmed at surgery are presented. Preoperative recognition is greatly aided by a tendency to calcify, as identified both by skull films and more sensitively by computed tomography. A well demarcated collection of rounded densities on CT scanning, showing mild contrast enhancement and no significant mass effect, should suggest the possibility of cavernous angioma. Conventional angiography characteristically reveals a hypovascular appearance without abnormal arterial feeding vessels. On films of high technical quality, a subtle vascular stain, possibly associated with a few large draining veins, may be detected. There is usually no mass effect unless there has been a previous episode of hemorrhage. Cavernous angiomas may manifest a pronounced increase in activity on radionuclide brain scanning.

AB-4028-77
Vesicular Transport of Horseradish Peroxidase From Brain to Blood in Segments of the Cerebral Microvasculature in Adult Mice — Van Deurs B (Anatomy Department A, University of Copenhagen, DK 2200 Copenhagen N, Denmark) — Brain Res 124: 1-8 (Mar 18) 1977*

The transfer of protein from the cerebral ventricles to the parenchymal bloodstream in mice was studied by electron microscopy. After perfusion with the protein tracer horseradish peroxidase (HRP, M.W. approx. 40,000) through the cerebral ventricles, the tracer penetrated the ependymal lining of the ventricles and was found in the extracellular space of the neuropil close to the ependyma. HRP was also seen in the vascular basement membrane and in endothelial vesicles opening at the abluminal endothelial surface, or situated within the endothelial vesicles opening at the abluminal endothelial surface, or situated within the endothelial cells in segments of the microvasculature (mostly small arterioles). In some of these segments HRP was also seen on the luminal surface of the endothelia and in surface-connected vesicles. The junctions connecting adjacent endothelial cells were never penetrated by HRP. It is concluded that vesicular transport of HRP across the endothelium of the cerebral microvasculature represents a possible mechanism for protein removal from brain extracellular space.

AB-4029-77
Detection of Subarachnoid Blood Clot and Other Thin, Flat Structures by Computed Tomography — Lim ST (Division of Neuroradiology, Little Company of Mary Hospital, Torrance, California), Sage DJ — Radiology 123: 79-84 (Apr) 1977*

Eight cases of subarachnoid hemorrhages are reported to illustrate the ability of CT to demonstrate thin, flat collections of subarachnoid blood clots and the importance of CT in localization of the bleeding site, especially in cases of multiple aneurysms. The major factors in the detection of these lesions are discussed on the basis of partial volume phenomenon.

AB-4030-77

Computed tomography (CT) is a reliable technique for examining patients with subarachnoid hemorrhage and intracranial aneurysms. Extravasated blood is easily recognized and the location of the ruptured aneurysm may frequently be predicted by its distribution into the subarachnoid spaces and brain parenchyma. CT alleviates the need for repeat angiography while following the patient’s clinical evolution since it clearly shows rebleed, edema, following vasospasm, and hydrocephalus.

AB-4031-77

Soluble fibrin monomer complexes (SFMC) were determined in users of different oral contraceptives. Quantitative gel filtration of β-alanin precipitated plasma samples yielded the relative (per cent of total fibrinogen content) and absolute (mg per 100 ml plasma) amount of SFMC. Increased levels of SFMC were observed in users of oral contraceptives, when compared to age, parity and socioeconomic background matched control groups. This increase was more pronounced in users of Neogynon (0.05 mg ethinyl estradiol, 0.25 mg norgestrel) than in the ones using Microgynon (0.03 mg ethinyl estradiol, 0.15 mg norgestrel). Users of Ovulen (0.1 mg mestranol, 1 mg ethynodiol diacetate) in addition to the rise of SFMC levels exhibited elevated fibrinogen levels in plasma. The data presented indicate a limited state of hypercoagulability in users of oral contraceptives.

AB-4032-77
Familial Intracranial Aneurysms and Cerebral Vascular Anomalies — Hashimoto I (Department of Neurosurgery, Toranomon Hospital, Tokyo, Japan) — J Neurosurg 46: 419-427 (Apr) 1977*
The author reports a family in which four members had intracranial aneurysms and one additional member was suspect. One member had multiple aneurysms that were successfully treated surgically. Elective angiography on five asymptomatic members of the family disclosed asymptomatic aneurysms in two. In addition, cerebrovascular anomalies were found in many of the family members. The parents of the family were consanguineous. High incidence of these associated anomalies and consanguinity in the parents tend to suggest the hereditary basis of the disease. Banding analysis of chromosomes in three siblings with aneurysms and three siblings without aneurysms was carried out. Elective investigation of the asymptomatic members should be considered where there are already two or more affected in a family. The indications for surgical prophylaxis on asymptomatic aneurysms in other members of the family are discussed.

**AB-4033-77**

Treatement of Myotic Intracranial Aneurysms — Bingham WF (Department of Neurosciences, Gunderson Clinic, Limited, La Crosse, Wisconsin 54601) — *J Neurosurg* 46: 428–437 (Apr) 1977*

Two patients with myotic intracranial aneurysms were successfully treated with only antibiotic therapy. One patient, who had subacute bacterial endocarditis, rheumatic valvular disease, and an abscessed tooth, sustained a subarachnoid hemorrhage from a ruptured right middle cerebral artery trifurcation aneurysm. The other patient, who had Turner’s syndrome and probable congenital aortic stenosis, developed multiple neurological findings during an episode of acute bacterial endocarditis precipitated by an infected ingrown toenail; a false aneurysm of the distal left middle cerebral artery and two lesions involving the left superior cerebellar artery were found. A study of the literature shows that only 45 patients with myotic intracranial aneurysms have received adequate antibiotic therapy and angiographic documentation. Statistically, there does not appear to be a clear-cut advantage to antibiotics plus surgical therapy over antibiotics alone. In fact, in 21 patients who underwent serial angiography, lesions were smaller in six and not visualized in 11. In four patients the aneurysms increased in size; in two others fresh lesions formed.

The author proposes the following diagnostic and therapeutic regimen: 1) earliest possible diagnosis of the underlying disorder; 2) appropriate antibiotic therapy; 3) early four-vessel cerebral angiography and follow-up studies every 2 to 3 weeks; 4) definitive surgery without delay if the aneurysm is larger on the first repeat study; 5) definitive operation upon completion of antibiotic therapy if the lesion is larger or the same size; and 6) postoperative angiography to evaluate the effectiveness of treatment and to search for interim lesions.

**AB-4034-77**

Aneurysmal Tumors of the Basifrontal Region — Maxwell RE (B590 Mayo, Box 96, University Hospital, Minneapolis, Minnesota 55455), Chou SN — *J Neurosurg* 46: 438–445 (Apr) 1977*

The authors report the cases of three men who presented for evaluation of a rapidly progressing dementia. All were found to have a giant aneurysmal mass in the basifrontal region, and all were successfully treated by surgical excision of the mass. The presenting syndrome included rapidly progressive and severe loss of recent memory associated with confusion, chronic headache, wide-based staggering gait disturbance, urinary urgency, frequency, and incontinence, and a fine tremor of the hands exacerbated by purposeful movements. The clinical presentation, radiological assessment, and surgical treatment are discussed.

**AB-4035-77**

Effects of Subarachnoid Hemorrhage on Cerebral Blood Volume, Blood Flow, and Oxygen Utilization in Humans — Grubb RL Jr (Department of Neurology and Neurological Surgery, Washington University School of Medicine, Barnes Hospital Plaza, St. Louis, Missouri 63110), Raichle ME, Eichling JO, Gado MH — *J Neurosurg* 46: 446–453 (Apr) 1977*

Forty-five studies of regional cerebral blood volume (rCBV), regional cerebral blood flow (rCBF), and regional cerebral oxygen utilization (rCMRO2) were performed in 30 patients undergoing diagnostic cerebral angiography for evaluation of a subarachnoid hemorrhage due to a ruptured intracranial aneurysm. Tracer methods employing radioactive oxygen-15 were used to measure rCBV, rCBF, and rCMRO2. The patient studies were divided into groups based on their neurological status and the presence or absence of cerebral vasospasm. Subarachnoid hemorrhage, with and without vasospasm, produced significant decreases in CBF and CMRO2. In general, patients with more severe neurological deficits, and patients with more severe degrees of vasospasm, had a more marked depression of CBF and CMRO2. The most striking finding was a significant (p < 0.001) increase in CBV (to 58% above normal) in patients with severe neurological deficits associated with severe cerebral vasospasm. This large increase suggests that cerebral vasospasm consists of constriction of the large, radiographically visible extraparenchymal vessels accompanied by a massive dilation of intraparenchymal vessels.

**AB-4036-77**

Pathogenetic Role of No-Reflow Phenomenon in Experimental Subarachnoid Hemorrhage in Dogs — Asano T (Department of Neurosurgery, University of Tokyo Hospital, Tokyo, Japan), Sano K — *J Neurosurg* 46: 454–466 (Apr) 1977*

The real pathogenetic role of no-reflow phenomenon in clinical situations such as the acute stage of subarachnoid hemorrhage (SAH) is not yet known. To study this problem, we carried out the following experiment in dogs: SAH was induced by withdrawing a needle previously inserted into the internal carotid artery through a small craniectomy in the lateral base of the skull: Complete dural repair and cranioplasty was done to avoid cerebrospinal fluid leakage. Cortical cerebral blood flow (CBF) changes, measured by a double-needle type thermocouple, intracranial pressure (ICP), electroencephalogram (EEG), and sensory evoked response were monitored under controlled ventilation for 3
hours after SAH. At the end of the experiment, the brain was perfused with carbon black solution at a pressure of 120 mm Hg. The 32 episodes of SAH thus induced yielded two basic patterns of ICP changes which simulated those previously reported with human SAH. In the first pattern, reactive hyperemia was always observed, followed by complete or incomplete recovery of cerebral function. Perfusion defects were frequently seen in the thalamus, basal ganglia, and parietooccipital cortex symmetrically. In the second pattern, prolonged elevation of ICP resulted in failure of recovery of both CBF and EEG. Carbon black filled only the pial arteries and the rest of the brain was totally unperfused. From the results, the pathogenetic role of the no-reflow phenomenon in the acute stage of SAH as influencing the prognosis is strongly suspected.

**AB-4037-77**

Effects of Cyclic AMP and Dibutyryl Cyclic AMP on Cerebral Hemodynamics and Metabolism in the Baboon — Tagashira Y, Matsuda M, Welch KMA, Chabi E, Meyer JS (Department of Neurology, Baylor College of Medicine, Houston, Texas 77030) — J Neurosurg 46: 484-493 (Apr) 1977*

Adenosine 3',5'-cyclic monophosphosphate (cyclic AMP) (0.5 mg/kg) was infused into the carotid artery of baboons anesthetized with sodium pentobarbital, causing a biphasic increase in cerebral blood flow (CBF) and reduction in cerebrovascular resistance (CVR) associated in each phase with stimulation of cerebral metabolism evidenced by increased cerebral oxygen consumption (CMRO2) and cerebral glucose consumption (CMRGl). Intracarotid dibutyryl cyclic AMP (0.5 mg/kg) caused a monophasic increase in CBF and reduction of CVR but failed to alter cerebral metabolism. This may be due to its rapid removal from the circulation with ineffective passage across the blood-brain barrier since intracisternal infusion of dibutyryl cyclic AMP caused sustained increase in CBF, CMRO2 and CMRGl and reduction in CVR. Intracarotid AMP (0.4 mg/kg) and adenosine (0.3 mg/kg) caused an immediate and more marked increase in CBF and decrease in CVR unassociated with cerebral metabolic change making it unlikely that the observed effects of cyclic AMP can be attributed to its breakdown products. Cyclic AMP or its dibutyryl derivative may alter cerebral metabolism secondary to neuronal activation but increase in glucose/oxygen utilization ratio after intracarotid cyclic AMP and intracisternal dibutyryl cyclic AMP also suggests an influence on enzymatic regulation of glucose metabolism.

**AB-4038-77**

Fibromuscular Dysplasia: Multiple “Spontaneous” Dissecting Aneurysms of the Major Cervical Arteries — Ringel SP (Department of Neurology, University of Colorado Medical Center, Denver, Colorado 80262), Harrison SH, Norenberg MD, Austin JH — Ann Neurol 1: 301-304 (Mar) 1977*

A patient presented clinically with acute bilateral carotid artery thrombosis and at autopsy had fresh dissecting aneurysms of all four major cervical arteries. The underlying vascular disorder was fibromuscular dysplasia. It is suggested that relatively minor injury to vessels already pathologically involved contributed to the multiple dissecting aneurysms in this patient.

**AB-4039-77**

Lid Abnormalities Secondary to Cerebral Hemisphere Lesions — Nutt JG (Department of Medicine, Division of Neurology, University of Washington School of Medicine, Seattle, Washington 98195) — Ann Neurol 1: 149-151 (Feb) 1977*

Two patients developed bilateral ptosis and difficulty initiating lid elevation that could not be explained by the ptosis after right hemisphere infarctions. The patients also had frontal release signs, and it is suggested that the lid abnormalities were secondary to bilateral cortical disease.

**AB-4040-77**

Hypertensive Putaminal Hemorrhage — Hier DB, Davis KR, Richardson EP Jr, Mohr JP (Department of Neurology, Massachusetts General Hospital, Boston, Massachusetts 02114) — Ann Neurol 1: 152-159 (Feb) 1977*

Twenty-four consecutive cases of putaminal hemorrhage diagnosed by the technique of computerized axial tomography are reported. The anatomy of the hemorrhages as visualized by CT scanning showed excellent correlation with the pathological findings in 3 autopsied patients. The size of the hemorrhage, as measured from the scan, was correlated with the occurrence and severity of several features of the clinical examination and with the clinical outcome. The relatively low overall mortality of 37% reflected the inclusion in this series of many small, nonfatal hemorrhages that would likely have escaped diagnosis before computerized axial tomography became available.

**AB-4041-77**

Basilar Artery Occlusion in a 10-Year-Old Boy — Ackerman ES, Levinsohn MW (Division of Pediatric Neurology, University Hospitals of Cleveland, Cleveland, Ohio 44106), Richards D, Bonstelle C, Mitchell M — Ann Neurol 1: 204-205 (Feb) 1977*

A 10-year-old boy developed vertigo and signs of brainstem dysfunction. Arteriography demonstrated complete occlusion of the basilar artery. No cause of the occlusion could be determined. This case emphasizes the rarity of basilar artery occlusion during childhood. Its differential diagnosis is discussed.

**AB-4042-77**

Increased Blood Fibrinolytic Activity After Aspirin Ingestion — Moroz LA (Royal Victoria Hospital, Montreal, Quebec H3A 1A1, Canada) — N Engl J Med 296: 525-529 (Mar 10) 1977

Aspirin and sodium salicylate increase the blood fibrinolytic activity in vivo and in vitro. Four normal subjects took 1.8 gm of aspirin, and whole blood fibrinolytic activity increased from 33 to 150% at one to three hours. The increase in fibrinolytic activity was less in platelet-deficient
plasma, and occurred only with aspirin. In vitro, sodium salicylate increases fibrinolytic activity of blood and of polymorphonuclear leukocytes, but aspirin does not. These findings indicated that cellular mechanisms are involved in fibrinolysis.

**AB-4043-77**

An Alternative Approach to Lesions in the Proximal Segments of the Brachiocephalic Arterial System — Gee W (Department of Surgery, National Naval Medical Center, Bethesda, Maryland), Oller DW, Schwartz JE — *Surg Gynecol Obstet* 144: 339–342 (Mar) 1977

If a lesion of the proximal brachiocephalic arterial system is to be repaired by an extrathoracic supraclavicular procedure, instead of a thoracotomy, it is necessary to determine whether the brain will tolerate clamping of the ipsilateral common carotid artery during the procedure. Ocular plethysmography, a measure of systolic pressure in the ophthalmic artery, carried out during preoperative evaluation with and without ipsilateral common carotid compression correlates well with direct measurement of common carotid arterial pressures at the time of surgery, with and without proximal carotid compression.

**AB-4044-77**


The tight junctions between endothelial cells in the vascular system of the brain can be opened and the blood-brain barrier disrupted for about 30 minutes following the intracarotid injection of a bolus of 2 M buffered urea solution. This was examined in baboons. The urea had no lasting effect on cerebral blood flow, oxygenation, or glucose utilization.

Using this technique, it should be possible to test the effects of various drugs on the brain and to detect endogenous substances in venous effluent from the brain.

**AB-4045-77**


In carotid endarterectomy, the nerves most likely to be injured are the greater auricular nerve, the hypoglossal nerve, the marginal mandibular branch of the facial nerve, the superior laryngeal nerve, and rarely the glossopharyngeal and recurrent laryngeal nerves. Detailed anatomy is presented and three illustrative cases are given.

**AB-4046-77**

Coagulation Abnormalities in Women Taking Oral Contraceptives — Carvalho ACA (Department of Medicine, Hematology Research Laboratory, Massachusetts General Hospital, Boston, Massachusetts 02114), Vaillancourt RA, Cabral RB, Lees RS, Colman RW — *JAMA* 237: 875–878 (Feb 28) 1977

Platelet function, coagulation, and fibrinolysis were studied in 13 healthy women taking oral contraceptives and in normal controls. Platelet aggregation and serotonin release were normal, as were the initiating steps of the intrinsic coagulation pathway. Prekallikrein was mildly elevated and kallikrein-inhibitor levels depressed. Heavy-molecular-weight fibrinogen derivatives were significantly elevated, and fibrin and its degradation products were low. Cholesterol levels were normal but triglyceride levels were higher than those of controls. In women taking oral contraceptives, there may be activation of the plasma coagulation system not instituted by factor XII nor potentiated by changes in antithrombin III. Fibrinolysis does not compensate adequately. Perhaps fibrinolytic agents would be useful to treat thrombotic complications in women on oral contraceptives.

**AB-4047-77**

Cooperative Study of Hospital Frequency and Character of Transient Ischemic Attacks. I. Background, Organization, and Clinical Survey — Dyken ML (Department of Neurology, Indiana University School of Medicine, Indianapolis, Indiana 46202), Conneally PM, Haerer AF, Gotshall RA, Calanchini PR, Poskanzer DC, Price TR, Swanson PD — *JAMA* 237: 882–886 (Feb 28) 1977

This paper presents the background information for the cooperative study. Neurologists at six hospitals investigated 1,328 patients with episodic symptoms like transient ischemic attacks (TIA). Diagnostic groupings, demographic studies, handedness, extent of clinical investigation, course of the symptom, smoking history, physical examination, laboratory studies, treatment, and follow-up form the basis of the study. TIs in this study were more common in men and less common in blacks. Median duration was 14 minutes for attacks in the carotid system and eight minutes for attacks in the vertebrobasilar system. TIs were more common in smokers. Peripheral vascular disease was more common in people with vertebrobasilar TIs. Bruits had poor clinical correlation, as did indirect measurements of blood flow. Treatment differed widely. Patients on anticoagulants had a higher mortality rate.

**AB-4048-77**

Effects of Voluntary Isometric and Isotonic Activity on Late Transcortical Reflex Components in Normal Subjects and Hemiparetic Patients — Conrad B (Department of Neurology, University of Ulm, 79 Ulm, West Germany), Aschoff JC — *Electroencephalogr Clin Neurophysiol* 42: 107–116 (Jan) 1977

Electrical stimulation of the median nerve during voluntary contraction produces three responses: the muscular M response, the spinal S response, and the C response, presumed to be a long-loop cortical response. The C response is more prominent during isotonic movements than during isometric movements. Repetitive trains of stimuli were facilitatory. In hemiparetic patients, the C response was absent or delayed on the paretic side. Perhaps the C response will be useful in investigating small lesions of the sensorimotor cortex.
Flow Patterns in Stenotic Blood Vessel Models — Azuma T (Department of Physiology, Shinshu University, Medical School, Matsumoto, Japan), Fukushima T — *Biorheology* 13: 337–355 (Dec) 1976

The authors performed a careful study of flow disturbances through stenotic tubes. Different degrees of stenosis caused different patterns of disruption of laminar flow. When the flow was pulsatile, however, constriction of the lumen caused other patterns of turbulence, some of which were able to move upstream against the direction of flow. The authors urge that models with pulsatile flow are necessary if we are to understand the events in a diseased artery.

Computerized Tomography and Intracerebral Hemorrhage — Hayward RD (Department of Neurosurgery, Atkinson Morley's Hospital, London SW 20, England), O'Reilly GVA — *Am Heart J* 93: 126–127 (Jan) 1977

Computerized tomography was performed on 100 consecutive patients with nontraumatic intracranial hematomas. Thirty-eight were primary hypertensive hemorrhage, 52 were ruptured aneurysms, eight were ruptured arteriovenous malformations, and two were bleedings into tumors. Ruptured aneurysms were distinguished from primary hematomas 90% of the time. Arteriovenous malformations and tumors were less easily diagnosed. Of the aneurysms, those of the anterior cerebral artery were diagnosed 100% of the time, those of the middle cerebral artery 83% of the time, and those of the internal carotid artery 66% of the time. The authors conclude that angiography is necessary for diagnosis and localization of the hematoma in the few cases where the CT scan is not diagnostic but will always be necessary before surgery is done for an aneurysm or arteriovenous malformation.


In 15 to 20% of patients with cerebrovascular insufficiency, kinked or coiled internal carotid arteries are the cause. Transient ischemic attacks are the main indication for surgical treatment, although it is justified within the first six to eight hours after a large stroke, if consciousness is preserved. In 38.5% of the kinked or coiled arteries, there was also stenosis at the bifurcation, and without this, auscultation was not helpful. During surgery, all redundant vessels must be opened and inspected for plaques. Sixty carotids were reconstructed with neither mortality nor serious morbidity, and transient ischemic attacks were abolished in all patients.

Transient Ischemic Attacks With Normal Arteriograms: Serious or Benign Prognosis? — Toole JF (Department of Neurology, Bowman Gray School of Medicine, Winston-Salem, North Carolina 27103), Yuson CP — *Ann Neurol* 1: 100–102 (Jan) 1977*

Of 226 patients with cerebral transient ischemic attacks (TIAs) evaluated with panarteriography, 16 had no demonstrable abnormalities in the aorto-cervico-cranial arterial tree. During a follow-up period ranging from three to eight years, 8 of the 16 were asymptomatic; 4 developed strokes and 3 died, 2 of cerebral infarction and 1 of myocardial infarction. The surviving patient who had a cerebral infarct continues to have TIAs. There were 2 other deaths, 1 from myocardial infarction and the other accidental. Two other patients continue to have TIAs.


A new piece of equipment was developed that records the intraocular pressure at the time of biomicroscopically observed collapse of the central retinal artery on the optic disc. A special contact lens with a properly adjusted pressure-sensitive probe allows exact observation of the optic disc and manual compression of the eye, whereas the foot-plate of the probe perceives the intraocular pressure through the applanated peripheral cornea.

Cluster Headache Syndrome and Migraine. Ophthalmological Support for a Two-Entity Theory — Hjarven I (Eye Department, Rikshospitalet, Oslo 1, Norway), Sjaastad O — *Acta Ophthalmol (Kbh)* 55: 35–51 (Feb) 1977*

Patients suffering from migraine, cluster headache and atypical cluster headache, including patients with chronic paroxysmal hemicrania, were studied with respect to corneal temperature, intraocular pressure and corneal indentation pulse amplitude changes during pain attacks. Significant rises in these three parameters were demonstrated during attacks of cluster headache and atypical cluster headache, indicating that intraocular vasodilatation with increased ocular blood flow occurs during attacks. No definite changes were found in migraine. The results strongly suggest that significant pathophysiological differences exist between migraine and cluster headache. The point is stressed that these disorders probably represent separate pathogenetic entities and should be classified as such, and not be grouped together within an ill-defined group of "vascular headache".

 transient ischemic attacks associated with oral contraceptives. Treatment With Dipyridamole and Aspirin — Mazal S (7 Etzel Street, French Hill, Jerusalem, Israel) — *J Neurol Neurosurg Psychiatry* 40: 9–10 (Jan) 1977*

A 24 year old woman after using birth control pills for two months began to suffer from frequent migraine-like attacks, which turned eventually into typical transient ischaemic at-
tacks (TIAs). A significant increase in spontaneous platelet aggregation was found, and combined treatment with dipyridamole and aspirin was started. After two months of treatment spontaneous platelet aggregation rate fell to normal limits and the TIAs disappeared. A causal relationship between increased platelet aggregability and TIAs is supposed.

AB-4056-77

Idiopathic Orthostatic Hypotension From Failure of Noradrenaline Release in a Patient With Vasomotor Innervation — Nanda RN (Department of Medicine, Clinical Medical School, Wellington Hospital, Wellington 2, New Zealand), Boyle FC, Gillespie JS, Johnson RH, Keogh HJ — J Neurol Neurosurg Psychiatry 40: 11-19 (Jan) 1977*

A 26 year old man is described with life-long orthostatic hypotension unrelated to autonomic nerve degeneration and apparently due to failure of peripheral noradrenaline release. Tests of parasympathetic and sympathetic cholinergic nerve function were normal, but sympathetic adrenergic activity was defective. Thus blood pressure regulation was abnormal. There was no pressor response to tyramine, an indirect sympathomimetic drug, but a marked pressor response to the directly acting sympathomimetic drugs phenylephrine and noradrenaline. On standing there was a progressive fall rather than a rise in circulating noradrenaline concentrations, although adrenaline levels rose normally. The pupils showed diminished responses to ephedrine and cocaine, and a normal response to phenylephrine. Fluorescence microscopy of blood vessels showed that they were innervated with adrenergic nerves. His orthostatic hypotension responded well to oral phenylephrine and cocaine, and a normal response to ephedrine (50 mg five times daily) but not to other forms of therapy. It is suggested that this patient's symptoms were due to failure of noradrenaline release even though sympathetic adrenergic nerves were present. We therefore wish to draw attention to a further cause of orthostatic hypotension, failure of peripheral noradrenaline release without autonomic neuropathy.

AB-4057-77

Safety of Carotid Ligation and Its Role in the Management of Intracranial Aneurysms — Miller JD (Division of Neurological Surgery, Virginia Commonwealth University, Richmond, Virginia 23298), Jawad K, Jennett B — J Neurol Neurosurg Psychiatry 40: 64-72 (Jan) 1977*

By using measurements of cerebral blood flow and internal carotid artery pressure it is possible to select patients in whom carotid ligation can be performed with a very low risk of postoperative cerebral ischaemia. A study has been carried out in 100 patients comparing this method with clinical predictions of the type used in aneurysm surgery based on age of the patient, arterial hypertension, time from latest subarachnoid haemorrhage, and neurological status on a modified Botterell scale. These clinical factors were found to be of little value in predicting which patients would and would not develop cerebral ischaemia after carotid occlusion.

AB-4058-77

Syndrome of Normal Pressure Hydrocephalus: Possible Relation to Hypertensive and Arteriosclerotic Vasculopathy — Koto A (Department of Pathology [Neuropathology], Albert Einstein College of Medicine, Bronx, New York 10461), Rosenberg G, Zingesser LH, Horoupian D, Kattman R — J Neurol Neurosurg Psychiatry 40: 73-79 (Jan) 1977*

A patient with clinical features of idiopathic normal pressure hydrocephalus, who responded dramatically to shunting, was found at necropsy to have a severe hypertensive and arteriosclerotic vasculopathy with multiple lacunar infarcts. There was no pathological evidence of thickened leptomeninges, fibrosis of the arachnoid villi, or Alzheimer's disease. An abnormal absorption mechanism was demonstrated with cisternography and by an increase in the concentration of homovanillic acid in the cerebrospinal fluid. It is suggested that vascular changes may play an important role in the pathophysiology in some cases of normal pressure hydrocephalus.

AB-4059-77

Effects of Sulfinpyrazone on Platelet Prostaglandin Synthesis and Platelet Release of Serotonin — Ali M, McDonald JWD (Department of Medicine, University Hospital, London, Ontario N6A 5A5, Canada) — J Lab Clin Med 89: 868-875 (Apr) 1977*

Sulfinpyrazone added to PRP inhibited the release of serotonin induced by collagen. The inhibitory effect depended strongly on the strength of the collagen stimulus. Serotonin release was also inhibited (up to 73 percent) in PRP prepared from subjects who had ingested the drug. This is the first demonstration of a direct effect of a sulfinpyrazone in vivo on in vitro tests of platelet function. Prostaglandin synthesis was studied with lysates of washed platelets, arachidonic acid, and silicic acid chromatography to isolate a reaction product which was tentatively identified as thromboxane B2. Platelet prostaglandin synthesis was shown to be strongly inhibited by sulfinpyrazone. Inhibition was competitive with respect to substrate. It is proposed that effects of sulfinpyrazone on platelet function may be due to inhibition of prostaglandin synthesis. The competitive nature of sulfinpyrazone inhibition may explain why sulfinpyrazone is a strong inhibitor of the release reaction under conditions of dilute collagen stimulation but is weak in the presence of stronger stimuli. In comparing the potency of inhibitors of platelet prostaglandin synthesis the nature of inhibition must be considered. Competitive inhibitors may be incorrectly regarded as weak if studied only at high substrate concentration.

AB-4060-77

Intimal Healing. The Pattern of Reendothelialization and Intimal Thickening — Stemerman MB (Thrombosis/Hemostasis Unit, Department of Medicine, Beth Israel Hospital, Boston, Massachusetts 02215), Spae T, Piliick F, Cintron J, Lejnicks I, Tiell ML — Am J Pathol 87: 125-142 (Apr) 1977*

Studies were undertaken to investigate further the basis of intimal proliferation and the identity of the surface lining
cell in rabbit aortas subjected to extensive deendothelialization. Endothelial cells were selectively removed by passage of an inflated balloon catheter through the arterial lumen. The healing response was evaluated at intervals up to 36 weeks by several techniques: 1) permeability to Evans blue, 2) reappearance of endothelial cells as indicated by the specific marker, adsorbed goat anti-rabbit tissue factor-horseradish peroxidase, 3) planimetric measurements of intimal thickness, and 4) electron microscopy. The results indicate that endothelial cell recovery progressed slowly and that it extended only from areas spared denudation. The regions not covered by endothelial cells were lined by cells of smooth muscle cell origin. Such surfaces were permeable to Evans blue protein complex, and their luminal smooth muscle cells were associated with connective tissue-like material at their luminal surface; this material apparently acted as a base for platelet accumulation. The present findings indicate that the lumen of the extensively denuded vessel is lined by either endothelial or smooth muscle cells and that intimal healing is related to restoration of endothelial cell cover. In addition, intimal thickening reached a maximum well before reendothelialization was complete.

AB-4061-77
Cerebral Ischemia During Carotid Endarterectomy With Severe But Reversible Changes — Kaufman HH (Division of Neurosurgery, 133 Freeman Building, 6400 West Cullen Street, Houston, Texas 77030), Reilly EL, Porecha HP, Khalil KG, Van Horn G — Surg Neurol 7: 195-198 (Apr) 1977*

Electroencephalographic monitoring of a patient during carotid endarterectomy demonstrated severe ipsilateral voltage suppression with preservation of rhythms when the common carotid artery was clamped. Because the atheromatous plaque extended almost to the base of the skull, it was impossible to insert a shunt. Occlusion time was 19 minutes. After carotid flow was reestablished, there was a rapid recovery of voltage. The patient awoke with a profound hemiparesis, but this cleared almost completely within a week. The EEG changes indicated severe ischemia, but, though function was transiently impaired, there was no apparent cerebral necrosis. This case represents the most severe yet reversible episode of ischemia during carotid clamping reported to date. Preservation of EEG rhythms, even in the face of voltage suppression, may have been a favorable sign.

*Authors' abstract

AB-4062-77
Balloon Occlusion of Carotid-Cavernous Fistula: Introduction of a New Catheter — Prolo DJ (Division of Neurosurgery, Stanford University Medical Center, Stanford, California 94305), Burres KP, Hanbery JW — Surg Neurol 7: 209-214 (Apr) 1977*

The most widely used technique for treatment of a carotid-cavernous fistula involves embolization of the fistula with segmental occlusion of the internal carotid artery. An inflatable balloon capping a small flexible catheter becomes a controlled embolus when positioned within the internal carotid artery at the stoma of the fistula. A new double lumen catheter has been designed. Through one lumen the carotid circulation may be displayed. The second lumen allows inflation of the balloon through a self-sealing valve. In twelve patients, results were excellent in eight, fair in two, and poor in two patients intolerant of carotid occlusion.

AB-4063-77

Focal changes in the cat cerebral blood flow were studied by the technique of H2 polarography. Areas studied included the caudate nuclei, thalami and midbrain. A unilateral mass effect was created by inflation of an epidural balloon. A rapid decrease in regional cerebral blood flow was noted ipsilateral to the mass at very small balloon volumes. This was followed closely by contralateral supratentorial decrease in regional cerebral blood flow. The normal midbrain blood flow was found to be preserved until total decompensation (herniation) occurred.

AB-4064-77

Autoregulation of regional cerebral blood flow was evaluated in cats. In normal baseline situations autoregulation was invariably present. Concomitant to an enlarging mass, supratentorial loss of this protective mechanism was seen both ipsilateral and contralateral to the mass. There was relative preservation of midbrain autoregulation until very high balloon volumes were reached. There was no acute recovery in autoregulation upon balloon deflation.

AB-4065-77
Colonic Pseudoobstruction in Patients With Stroke — Reynolds BJ, Eliasson SG (Department of Neurology, Washington University School of Medicine, St. Louis, Missouri 63110) — Ann Neurol 1: 305 (Mar) 1977

Four patients had colonic "pseudo"-obstruction within a few weeks of serious strokes. In this syndrome, there is progressive dilatation of the proximal colon without mechanical obstruction, and its end-point is cecal perforation. Since gas and stools may still be passed, bowel sounds may be present, and electrolytes may remain normal, serial flat plates of the abdomen should be obtained when stroke patients have abdominal distention, to monitor cecal diameter and its rate of increase. If cecal diameter is 12 cm or greater or fails to improve in three days, cecostomy may be lifesaving.

AB-4066-77
Microflow and Cortical Oxygen Pressure During and After Prolonged Cerebral Ischemia — Leniger-Follert E (Max-

Cortical blood flow in cats after regional cerebral ischemia. Return of blood flow results in reactive hyperemia and an increase in tissue oxygen tension. This reoxygenation begins in less than a minute and is homogeneous. In a few hours, hyperemia ends, and the pattern of cortical oxygenation approaches normal. Should there be brain swelling during this critical time, severe cerebral hypoxia may be the result.

AB-4070-77

Cases are reported in which removal of the sympathetic ganglia of T2-T4 and the caudal third of the stellate ganglion resulted in improvement of leg function in patients with transverse myelopathy and sensory levels at T10 or L1. The mechanism is not clear, but perhaps alleviation of spinal cord ischemia was a factor. There is in Japan a syndrome of rapidly-evolving myelopathy in patients with chronic gastrointestinal disease or following bowel surgery, and the reported patients were believed to suffer from it.

AB-4069-77
The Long-Term Prognosis in Untreated Cerebral Aneurysms: I. The Incidence of Late Hemorrhage in Cerebral Aneurysm: A 10-Year Evaluation of 364 Patients — Winn HR (University of Virginia School of Medicine,
Aseptic Thrombosis of Orbital Veins and Cavernous Sinus. Clinical Symptomatology — Brismar G (Department of Ophthalmology, University Hospital, S-22185 Lund, Sweden), Brismar J — Acta Ophthalmol (Kbh) 55: 9-22 (Feb) 1977

Painful ophthalmoplegia can be caused by several disease processes in the cavernous sinus: septic thrombosis, carotid aneurysm, fistula, neoplasm, or the granulomatous condition described by Tolosa and Hunt. Orbital phlebography of eight patients found unexplained filling defects of the cavernous sinus or superior ophthalmic vein, and these are felt to be cases of aseptic cavernous sinus thrombosis. These patients cannot be separated clinically or by phlebography from patients with Tolosa-Hunt syndrome or tumor, nor does response to steroids or heparin distinguish them. Patients with painful ophthalmoplegia deserve carotid angiography, tomography of the base of the skull, and nasopharyngeal examination.

ABSTRACTS 643


From a series of 325 cases of cerebral arteriovenous malformations, seven patients are reported presenting a change in size of the malformation in the course of several years. The enlargement of the malformation is documented by four vessel cerebral angiography, and the haemodynamic and histopathological characteristics are discussed. Serial four vessel cerebral angiography is strongly indicated for accurate diagnosis, and radical excision of these malformations with the microtechnique method is advocated.

ABSTRACTS 643

The authors review 38 cases of hypertensive intracerebral hemorrhage operated on within 7 hours after the apoplectic attack. Microsurgical technique was used for hemostasis and evacuation of the hematoma. At the 6-month follow-up
study, 34 patients could walk unaided or with a cane, one was confined in bed, and three had died.

**AB-4079-77**

A consecutive series of 137 patients with cerebral aneurysms operated on with microsurgical techniques is presented. Occlusion of the aneurysm was performed in 133 patients. Good results were obtained in 85.5% of the entire series and in 92.6% of the patients who were in satisfactory condition preoperatively. The overall mortality rate was 5.8%, and 3.7% for the patients in satisfactory condition. The preoperative and operative factors that influenced the results are discussed.

**AB-4080-77**

Computed tomographic (CT) scans of fresh and coagulated blood *in vitro* as well as calcium and iron solutions demonstrate that the increased absorption seen in hematomas is primarily a reflection of hemoconcentration: calcium plays essentially no role in this increased absorption, while iron makes a minimal contribution. *In vitro* studies of cerebrospinal fluid (CSF) indicate that CT scanning is insensitive to pathological elevations of CSF protein.

**AB-4081-77**
Computed Tomography of Spinal Cord Arteriovenous Malformations — Di Chiro G (Section on Neuroradiology, Building 10, Room 2D13, National Institutes of Health, Bethesda, Maryland 20014), Doppman JL, Wener L — *Radiology* 123: 351–354 (May) 1977*

Computed tomography (CT) of the spine after intravenous contrast enhancement has been used in 4 patients with arteriovenous malformation (AVM) of the spinal cord. The enlarged, contrast-filled vessels constituting the malformation are visualized on CT scans. There was good correspondence between CT and selective angiography. CT may be a useful screening and follow-up method for AVM of the spinal cord and a safe procedure for assessing the results of therapy.

**AB-4082-77**
Normal Ocular Circulation and the Effect of Arterial Occlusive Disorders — Li FC, Tenner MS (Department of Radiology, Downstate Medical Center, Brooklyn, New York 11203), Rothman L, Quencer RM — *Radiology* 123: 369–374 (May) 1977*

Arterial occlusive disease, either primary or secondary, may not only affect the appearance of the ophthalmic artery, posterior ciliary arteries, and choroid crescent, but may be reflected in the prolongation of the circulation time to the choroid crescent. Choroid circulation time determined in 80 normal carotid angiograms showed that a value > 4.5 sec. for a population under 30 years of age, and > 5.6 sec. for a population 30 years of age and older, is prolonged. One should view these studies with suspicion and search for intracranial, intracranial, or extracranial arterial occlusive disease.

**AB-4083-77**
Cerebrovascular Disease in Childhood — Savage JP (Department of Radiology, Division of Nuclear Medicine, Hospital for Sick Children, Toronto, Ontario M5G 1X8, Canada), Gilday DL, Ash JM — *Radiology* 123: 385–391 (May) 1977*

Cerebrovascular disease was reviewed in 92 suspected or proved pediatric cases. In addition to the classical adult patterns of the disease, a separate group of patterns occurs in children and infants who suffer a severe transient episode of cerebral hypoxemia. The patterns in the newborn are periventricular increase, laminar cortical necrosis, watershed infarct, rapidly clearing infarct, and diffuse increase. Bilateral extensive patterns correlate well with an ensuing generalized neurological deficit, and localized patterns with a focal deficit. The mixed and diffuse patterns were found to be the most common.

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Circulating platelet aggregates formed in vivo were serially measured, and platelet-aggregation thresholds were determined in vitro in 82 patients with acute cerebral ischaemia. The percentage of aggregated platelets was increased in 53 patients with completed stroke (30.9% ± 2.0) and in 29 patients with transient ischaemic attacks (34.1% ± 2.3), all studied within 10 days of the acute event. These values were higher (*P < 0.001*) than levels of aggregated platelets in 30 patients with non-vascular neurological disease (16.8% ± 2.3). The percentage of aggregated platelets returned to normal 10 days to 6 wk after acute cerebral ischaemia. Aspirin and dipryridamole did not affect either the increase in or subsequent normalisation of circulating-platelet-aggregate levels in these patients. Platelet-aggregation sensitivity to adenosine diphosphate and adrenaline was also increased in patients with acute cerebral ischaemia, but this abnormality resolved during convalescence. Platelet activation is abnormal in acute cerebral ischaemia but usually returns to normal with or without anti-platelet therapy. This activation of platelets may contribute to the clinical manifestations of occlusive vascular disease.

*Authors' abstract*
The arterial angioarchitecture of twenty post mortem brains, containing thirty infarctions, was examined by means of the translucidation technique after filling the arterial system with a colloidal barium sulphate solution. Although the large as well as the small arteries and arterioles were filled to a variable degree in the infarcted areas, the angioarchitecture was generally severely affected. Their differences were compared in red and white softening areas, and cases of thrombosis, embolism, hemodynamic disturbances and compression of arteries. Also the influence of arterial hypertension and of the age and the location of the infarction determined.

Left Atrial Thrombosis Complicating Mitral Stenosis: Results of Surgical Treatment — Pelletier C (Cardiovascular and Thoracic Surgery, Sacré-Coeur Hospital, Montreal, Quebec H4J 1C5, Canada), Bizri S, Cossette R, Doutigny L, Levy R — Can J Surg 20: 101-106 (Mar) 1977*

In 343 patients treated surgically for mitral valve disease, there was thrombosis of the left atrium in 40. Massive atrial thrombosis was present in 32 of them, yet the diagnosis was suspected or established preoperatively in only 12, because of insufficient clinical signs. A transventricular mitral commissurotomy was performed in 32 patients and mitral valve replacement in the remaining 8. Surgical mortality was 23% in the patients with atrial thrombosis compared with 7% in the thrombus-free patients: 66% of the deaths were due to cerebral embolism. Systemic embolism occurred in 17% of the patients who had a closed approach initially and in 27% following a planned open procedure. Among the survivors, 65% were asymptomatic or markedly improved; the average follow-up was 42 months. Atrial thrombosis increases the surgical risk because of the high incidence of operative embolism, a complication that is not avoided by the use of open procedures, but that could be prevented by earlier surgical treatment of mitral stenosis, before atrial thrombi develop.

Spontaneous Successive Occlusion of the Circle of Willis — with the Growth of Abnormal Vascular Networks at the Base of the Brain — in Relation to the Pathogenesis of so-called “Moyamoya” Disease — Ohno K (Department of Neurosurgery, Tokyo Medical and Dental University, Tokyo, Japan), Fujimoto T, Komatsu K, Inaba Y, Ida T — Brain and Nerve (Tokyo) 29: 37-42 (Jan) 1977*

The pathogenesis of the so-called “Moyamoya” disease which is an angiographical syndrome is still unknown. A 42-year-old case was presented and discussed in relation to the pathogenesis of the syndrome.

A right handed carpenter was referred to our clinic with a chief complaint of memory disturbance. Consciousness was clear. Memory and calculation were slightly disturbed. Electroencephalography revealed marked theta activity and 1.5-3 Hz delta waves more pronounced on the left side. Left carotid angiograms showed diffuse narrowing and marked stenosis at the terminal portion of the internal carotid artery and the occlusion at Al portion of the anterior cerebral artery and at M1 portion of the middle cerebral artery. Slight vascular networks were shown at the base of the brain. The early filling of the internal cerebral vein was seen. Right carotid angiograms showed diffuse narrowing of the internal carotid artery and a stenosis at the origin and segmental narrowing at M2 portion of the middle cerebral artery. Left vertebral angiograms showed marked retrograde filling from the posterior circulation to the anterior. The fenestration of the vertebral artery was found.

Afterwards he was observed as an outpatient in our clinic and his mental disturbance gradually improved. About one year after the first attack he developed disturbance of articulation, left facial paresis and left hemiparesis. Right carotid angiograms showed the occlusion of the internal carotid artery at its terminal portion. Left carotid angiograms demonstrated the growth of abnormal vascular networks at the base of the brain. Three months after the last attack the clinical signs and symptoms almost disappeared.

In this case the development of the signs and symptoms and angiographical changes may be possibly based on the occlusion of internal carotid arterial system. However it is not clear why the occlusion occurred. Abnormal vascular networks increased one year after the middle and anterior cerebral arteries had occluded. The angiographical change shows an interesting fact of the development of cerebral collateral circulation, though it can not explain all causal geneses of the so-called “Moyamoya” disease. The occlusion of the circle of Willis was likely a cause of the development of abnormal vascular networks and it is conjectural that its development was due to the growth of perforating arteries.

Items of Interest

The Patient With Syncope — Noble RJ (Indiana University School of Medicine, Indianapolis, Indiana 46202) — JAMA 237: 1372-1376 (Mar 28) 1977

Review of etiology and diagnosis.

Symposium:


Molecular Interactions in Human Atherosclerotic Plaques — Smith EB (Department of Chemical Pathology, University of Aberdeen, Aberdeen, Scotland) — Am J Pathol 86: 665-674 (Mar) 1977

Response to Injury and Atherogenesis — Ross R (Department of Pathology, University of Washington, Seattle,

Patterns of Cellular Proliferation in Normal and Tumor Cell Populations — Gartler SM (Department of Medicine, University of Washington, Seattle, Washington 98195) — Am J Pathol 86: 685-692 (Mar) 1977

Implications of the Monoclonal Character of Human Atherosclerotic Plaques — Benditt EP (Department of Pathology, University of Washington, Seattle, Washington 98195) — Am J Pathol 86: 693-702 (Mar) 1977

Microsurgical Anatomy of the Upper Basilar Artery and the Posterior Circle of Willis — Saeki N, Rhoton AL Jr (Division of Neurological Surgery, Box J-265 Health Center, University of Florida, Gainesville, Florida 32610) — J Neurosurg 46: 563-578 (May) 1977
Abstracts

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