ABSTRACTS
Editor: Stanford Wessler, M.D.

Abstracters

Domingo M. Aviado, Jr., M.D., Philadelphia
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Elliott L. Sagall, M.D., Boston
Charles R. Shuman, M.D., Philadelphia
Louis A. Soloff, M.D., Philadelphia
S. O. Waife, M.D., Indianapolis
Martin H. Wendkos, M.D., Philadelphia

BLOOD COAGULATION AND THROMBOEMBOLISM


Of 1,000 "good-risk" patients having acute myocardial infarction, the half receiving anticoagulants (per cent) but a significantly lower incidence of lumps had a similar case fatality rate (3.1 vs. 3.5 thromboembolism (0.8 vs. 3.7 per cent). The authors believe that this gain does not justify the bother and the danger of hemorrhage involved in anticoagulant therapy in this type of patient. Anticoagulants are advised in most of the minority of patients with acute myocardial infarction falling into the "poor-risk" group and having a case fatality of 60 per cent and a thromboembolism incidence of 10.6 per cent.

Rogers


The AHF activity of bank blood and plasma shows variable stability with slow and progressive deterioration to levels of 30 to 60 per cent of the initial activity after a 3-week storage period. Among the factors that influence the amount of AHF remaining on storage are the initial plasma AHF level of the donor, the type of anticoagulant used, the amount in collection and storage of blood. The preservation of AHF is improved at lower temperatures of storage. In fresh frozen plasma about half the activity is lost in 1 month after which it tends to be stable. At 56 C, AHF is rapidly inactivated. In lyophilized plasma, AHF is stable over a period of years; on reconstitution, its potency is about half that of fresh plasma. Nearly normal levels were maintained in frozen plasmas, carefully collected using citrate or cation exchange resin as anticoagulant. AHF is unstable in oxalated plasmas. For stabilization of this factor prevention of the earliest clotting sequences during collection appears essential.

Shuman


Coagulation studies were performed on 7 control individuals, 6 patients with idiopathic hyperlipemia, and 5 with idiopathic hypercholesteremia. In addition, most of the patients were retested after a standard meal of fat. In none of the individuals was there an alteration of the standard clotting time, 3-tube silicone clotting time, standard prothrombin time, serum prothrombin activity, thrombin generation, and thromboplastin generation. Depending upon the content of triglyceride, there was a distinct difference in the behavior of various plasmas to the action of "incomplete" thromboplastin (Stypven). Stypven prothrombin time was definitely shorter in 4 of 5 healthy control subjects after the ingestion of fat. In the 1 who did not have a shorter time, the expected rise in serum triglycerides (neutral fat) failed to occur. In the patients with idiopathic hyperlipemia, Stypven prothrombin times were abnormally shortened prior to the ingestion of fat, and were only slightly altered after the meal of fat. In the patients with idiopathic hyperchole-
lesteremia, the Stypven prothrombin time was similar to that observed in the control group. Chemical and electrophoretic studies revealed that reduction in the Stypven prothrombin time was correlated with an increase in serum triglycerides. Centrifugation of hyperlipemic plasma into 2 fractions, fat-rich and fat-poor, also revealed a correlation between the content of fat and reduction of the Stypven prothrombin time. No change in erythrocytic fragility (osmotic or mechanical) was observed after the ingestion of food. Intact platelets and disrupted platelets, even more so, exerted an effect similar to that of triglycerides in that they shortened the Stypven prothrombin time. A thromboplastin potentiator (triglycerides) in the plasma, either postprandially or in normal persons or, perhaps more important, constantly in hyperlipemic patients, may result in increased coagulability and thrombosis when thromboplastic material is liberated into the blood stream.

Wendedos


Acute thrombosis of the portal vein is a relatively rare and extremely serious occurrence. Death occurs not from the portal vein thrombosis itself but, rather, from the complications arising from propagation of the clot, usually intestinal thrombosis. It seemed, therefore, that anticoagulant therapy, if begun early in the course of the disease, would be a logical form of management.

A 53-year-old man developed acute upper abdominal pain with signs of toxicity, fever, nausea, vomiting, constipation, and confusion. There was laboratory evidence of hepatic, pancreatic, cholecytis, and small intestinal dysfunction. Exploratory laparotomy revealed a thrombosis in the portal vein. Anticoagulant therapy (heparin) was administered early, and the patient made a reasonably good recovery. Migratory thrombophlebitis has been noted since the operation.

Waipe

ELECTROCARDIOGRAPHY, VECTORCARDIOGRAPHY, BALLISTOCARDIOGRAPHY, AND OTHER GRAPHIC TECHNICS


Ballistocardiographic readings of ectopic beats usually reveal small head-foot waves that often are larger than those of the normal or compensatory beats. Study of this phenomenon in patients with ectopic beats with atrial fibrillation and with normal sinus rhythm showed that the degree of prematurity greatly influenced the ballistocardiographic systolic complexes, for very early beats produced little ballistocardiographic motion while somewhat later beats occasionally had large lateral systolic complexes. Factors, such as mitral stenosis and the inspiratory phase of normal respiration, which reduce the rate of return flow to the left ventricle prolonged the interval after a normal systole during which premature beats evoked small ballistocardiographic waves. On the other hand, aortic insufficiency and myocardial failure, which hasten early inflow, tended to produce short intervals in which small complexes were seen. These findings were interpreted as indicating that motion of blood, rather than motion of ventricular muscle masses, is responsible for almost all the ballistocardiographic force and that motion of blood at the A-V orifices contributes greatly to the genesis of the lateral forces recorded during ventricular systole.

Sagall


This paper is a preliminary report on an instrumental approach to fetal distress using fetal electrocardiography. To obtain an accurate record of the fetal heart rate during labor, the maternal electrocardiogram must be removed, since both electrocardiograms are present as vectors in a volume conductor. This may be done by in-phase cancelling of the maternal complex in a differential amplifier. The early experimental results indicate that it is possible to match and to balance one complex against another, although exploration of a system for rectification, integration, and differentiation is currently under way.

Waipe


The authors studied the effects of various nonpathologic factors such as exercise, ingestion of food, smoking, change in posture, and deep breathing upon the electrocardiograms of healthy young persons and found that QRS complex, S-T segment, and T-wave changes frequently occurred. Since electrocardiograms are generally made under uncontrolled conditions, the necessity for recognition of the effects of these nonpathologic factors in differentiating normal from abnormal electrocardiographic findings is emphasized. In regard to evaluation of the exercise electrocardiogram the authors illustrate and
point out the necessity for revision of the criteria selected by previous writers for distinguishing an abnormal from a normal change.

SAGALL


Phonocardiographic data are presented in 5 cases of mitral stenosis before and after mitral surgery. All developed a postcommisurotomy syndrome. Immediately after surgery, the presystolic murmur disappeared and a systolic murmur was recorded. The latter vanished again in the later postoperative period independently of the commissurotomy syndrome. A diastolic apical murmur and opening snap were not modified by surgery. Splitting of the second sound in the pulmonary region disappeared and accentuation of the apical first sound diminished but the latter recurred after some time and in 1 patient a delay of its inscription was recorded in a later postoperative period. This and the high incidence of the postcommisurotomy syndrome suggest to the authors that in spite of a generally excellent status of the patient, recurrence of mitral stenosis may take place in some instances.

Pick


Ballistocardiograms were recorded from the isolated frog heart, with the help of a specially constructed high frequency instrument. The records did not differ significantly from those obtained in the entire animal, leading the authors to the conclusion that impulses generated by cardiac contraction play a fundamental role and perhaps are entirely responsible for the ballistocardiographic deflections.

Pick


The authors recorded by a modified Dock method the ballistocardiogram in 20 patients with various types of congenital heart disease, and in 4 with mitral disease. In patients with increased right and left ventricular output, e.g., in tetralogy, in a ventricular septal defect, in a patent ductus and in arteriovenous aneurysm, the ballistocardiogram showed an augmentation of all deflections. In patients with increased right ventricular and reduced left ventricular output as in atrial septal defects only the first part of the curve, the I-J waves, were large; whereas the K wave was smaller than usual, as occurs in correlation. In the trilogy of Fallot, the II deflection had a particularly tall amplitude interpreted as a consequence of the increased left atrial filling. No ballistocardiographic abnormalities were found in pure pulmonary stenosis, in cases with Eisenmenger's complex, and in Ebstein's disease. In cases with rheumatic valvular disease the results were inconsistent.

Pick


The pressure gage operates on the Wheatstone bridge principle and has a very stiff, nickel-plated membrane with a resonant frequency of 1,500 c.p.s. and a displacement of 3 x 10^{-7} ml per 10 mm. Hg. The amplifier has a built-in cathode ray scope that can be used for direct pressure readings. The output of the amplifier can be registered with a multiple-channel electrocardiograph.

LEPSCHUKIN


In a series of 56 patients with uremia, followed with serial electrocardiographic and blood chemistry studies, electrocardiographic changes due to hyperpotassemia have been observed in 18 patients. In most cases multiple abnormalities of contour and of rhythm have been observed; and in a few, a single change appears to be the initial electrocardiographic manifestation of hyperpotassemia (peaked, tall T-waves in 2 patients; prolonged P-R interval in 1). A progressive widening of the QRS interval has been noted in all patients. In 1 patient an electrocardiogram, obtained a few minutes before death, simulated a posterior subepicardial infarction. Pre-existing electrocardiographic changes, the association of other electrolyte disturbances, and intercurrent diseases may explain why in some patients the serial changes noted differ from the expected sequence, also observed experimentally. The opinion is expressed that more patients would have presented the electrocardiographic effects of hyperpotassemia if more frequent electrocardiograms had been obtained in the terminal phase of their disease; some patients, however, were followed closely and did not show characteristic electrocardiographic changes. Notwithstanding these limitations and the discrepancies sometimes observed between the electrocardiographic findings and the blood serum potassium level, the electrocardiographic study of patients in uremia
and hyperpotassemia is advocated. The mechanism of the electrocardiographic changes and the treatment of hyperpotassemia are briefly discussed.

**CALABRESI**


The technic of catheterization of the left side of the heart by means of a needle puncture into the left atrium and the introduction of a fine plastic catheter down through this needle into the left ventricle and out into the aorta is described. The authors believe that this method of investigation has much to offer in the accurate diagnosis and study of mitral and aortic valvular disease. Since this procedure has been connected with some complications, several of which cannot be avoided, the authors advise its use only in those cases where information obtained will be necessary for a decision as to a surgical exploration. Pain in the right chest, slight postcatheterization fever, extrastoles, and some hemopericardium are sequelae of short duration commonly encountered and are not considered as complications. Major complications include cardiac tamponade, ventricular fibrillation, cerebral embolism, pneumonia, and pericarditis; minor complications, include small pneumothorax, hemoptysis, pleural effusion, atelectasis, and hematopericardium. In 128 patients, left heart catheterization was without complications in 71. Fifty-one patients had minor complications and 6 major complications. Of 39 patients with angiocardiography through a needle in the left atrium, 9 had minor complications, 8 major complications, and 22 no complications.

**SAGALL**


The cardiac output by the dye method, the "intrathoracic blood volume" and the forearm blood flow were measured in 11 patients with typical myocardial infarction and were remeasured in 9, four to 9 weeks after recovery. The jugular venous pulse was increased in all and dropped after recovery. Neither the pulse rate nor mean arterial pressure gave significant information of the severity of the illness. Cardiac output was reduced during infarction and correlated well with the severity of the illness. It rose after recovery in 6 of the 7 patients studied. The stroke volume increased in all. The fall in cardiac output was less than that usually seen in left ventricular failure. The forearm flow was reduced during infarction and rose after recovery. The "intrathoracic blood volume" was slightly increased in infarction and returned to normal after recovery.

These changes suggest that vasoconstriction and so-called "shock" are a homeostatic reaction. Vasoconstrictive drugs therefore appear indicated, whereas transfusions appear inadvisable.

**SOLOFF**

**ENDOCARDITIS, MYOCARDITIS, AND PERICARDITIS**


A case report is presented describing the clinical features and autopsy findings in a young adult male who died suddenly from what appeared to be myocarditis. On microscopic examination, there was a diffuse myocarditis caused by giant-cell infiltration between the myocardial fibers. A review of the literature is presented. In all of the previous reported 13 patients, as well as this one, the disease was of sudden onset and ran a rapidly lethal course. All patients showed the same pathologic changes. The etiology was obscure, but it was suggested that tuberculosis or sarcoid might be the cause. There were, however, no other lesions found in any of the other organs.

**HARVEY**


The authors described 2 patients with chronic idiopathic pericarditis, manifesting massive effusion and cardiac tamponade, successfully treated surgically. One was a 16-year-old girl and the other, a 53-year-old man. In both instances an extensive pericardiectomy was performed, resulting in immediate clinical improvement. No postoperative complications occurred. It was concluded that patients with chronic idiopathic pericarditis with massive effusion and cardiac tamponade should be treated surgically at an early date.

**ABBRELMAN**


Among 66 patients hospitalized for complications following smallpox vaccination, 2, aged 19 and 16 years, with eczema vaccinatum, revealed transiently significant T-wave alterations in serial electrocardiograms. In one there were no clinical signs of myocarditis, while the other had persistent tachycardia, gallop rhythm and during convalescence reduced physical working capacity. On the assumption that these 2 cases were in-
stances of postvaccinal myocarditis, the authors discuss its possible pathogenesis, prevention, and treatment.

Pick


Not one of 43 patients with subacute bacterial endocarditis due to Streptococcus viridans was edentulous. In 7 the initial attack was specifically related to dental extractions. Relapses occurred in no patient with dental extractions but did occur in 5 patients who retained teeth after the first attack.

McKusick

HYPERTENSION


A case is reported of a 37-year-old man who developed severe hypertension with a rapid, malignant, downhill course that was reversed by the operative removal of the right kidney, which had an infarction due to occlusion of the renal artery. Study of this case and review of the available literature with particular emphasis on patients whose unilateral renal hypertension resulted from occlusive disease of the renal arteries showed a number of common clinical features. For unknown reasons, the disease appears to show a predominance for males. The hypertension is of short duration with an accelerated clinical course manifested by retinopathy, headaches, and high diastolic pressures. Leukocytosis, polyuria, albuminuria, and impairment of urinary concentrating ability frequently are found as part of the reversible form of the syndrome. Since the affected kidney may show normal visualization by intravenous pyelography, lumbar aortography, split-function studies, and observation of change in the size of the kidney may be better objective criteria in the diagnosis of unilateral occlusive disease of the kidney.

Sagall


Hexamethonium and dibenamine do not significantly change the blood pressure in normal rabbits. These 2 drugs do reduce blood pressure in renal and cerebral hypertensive animals. Benzo-.

Paradoxically, serious and sometimes fatal hypertensive vascular disease may be precipitated by the successful repair of coarctation of the aorta. The authors have classified these hypertensive reactions into 2 types, immediate and delayed. In the immediate type, a significant rise in the blood pressure may develop and regress in the first 36 hours. This is of no clinical significance. It is possibly due to a disturbance in the pressor receptors in aortic and carotid arteries. The delayed is the more ominous type, is principally diastolic, and may occur on the second postoperative day. In some patients this may be associated with abdominal pain. Small bowel necrosis has occurred occasionally. In fatalities, arterial necrosis has been found localized to vessels originating from below the coarctation site. The arterial and arteriolar lesions resemble those seen in experimental renal hypertension. There was an apparent predisposition for the vessels of the small intestine to be involved. In 2 patients with abdominal pain, diastolic hypertension and rising white blood cell count, the administration of hydralazine hydrochloride provided effective and immediate relief. Exploratory laparotomy was performed on 2 patients with the discovery of multiple and extensive areas of gangrenous bowel in both. One patient died on the operating table and the other survived after resection of the gangrenous intestine. Case reports of individual patients are presented and various theories concerning the etiology of the delayed hypertensive reaction are discussed.

BROTHERS

METABOLIC EFFECTS ON CIRCULATION


Change in body temperature, produced by an increase or decrease in metabolism, causes homeostatic neurocirculatory mechanisms to change blood flow to the skin by vasodilatation or constriction. From the change in peripheral resistance, cardiac output is reflexly increased or diminished, with tachycardia or increase in stroke output, or the opposite, while mean arterial blood pressure is preserved in the normal range. The fact that the myocardium shares in the general metabolic effect of the thyroid hormone contributes to the maintenance of the new level of circulatory performance. Various visceral organs appear to function at different metabolic levels. Their varying oxygen needs seem to be satisfied in some instances by increased blood flow and in others by increased oxygen withdrawal from a more or less constant blood supply. Organs and tissues respond to an excess of thyroid hormone with various levels of metabolic rate. Confronted by the difficulties of adapting to imbalance of this particular hormone, the circulatory system reacts in ways that are in some instances beneficial and in others detrimental.

BERNSTEIN


Oxygen consumption was reduced to hypothyroid levels in reserpine-treated hyperthyroid and euthyroid animals but there was no significant effect obtained in the hypothyroid animals. The failure of reserpine to antagonize the increase of oxygen consumption produced by 2, 4 di-nitrophenol and to depress oxygen consumption of hypothyroid animals makes a generalized depression of metabolism unlikely. The action of reserpine as a thyroxine antagonist is postulated but a central hypothalamic-hypophyseal or a direct thyroid effect is not eliminated. Changes in body weight in all the animals were probably due to decrease in food and water intake during drug therapy.

AVIADO


The addition of this steroid to the isolated cat papillary muscle or perfused heart preparation resulted in a positive inotropic action, an increased uptake of intramuscular sodium and loss of potassium. Larger amounts gave the opposite effect. It is postulated that 1 or more naturally occurring steroids are necessary for cardiac function. The fact that such small amounts (1.0 µg./ml.) of the compound are needed to elicit a positive inotropic response is indicative of a specific action on cellular activity, probably exerting its influence by altering membrane permeability.

PHARMACOLOGY


Previous studies by the senior author have demonstrated that external local application of epinephrine, norepinephrine, epinephrine and vasopressin on the arterial wall of the carotid sinus and aortic baroreceptive areas caused a stimula-
tion of the baroreceptors and a marked fall of the systemic arterial pressure in normal and in hypertensive dogs. Priscoline and papaverine caused a rise of pressure if applied in the same manner. The resistance to stretch and state of contraction of the muscular wall were considered responsible. Experiments were performed on segments of the carotid artery including the carotid sinus, excised from dogs, in order to evaluate the action of dilator and constrictor drugs on the pulsatile distensibility of the arterial wall. Pressure changes in the arterial segment were recorded with the aid of a Statham pressure transducer. Pulsations were induced by means of a rotating device between a pump and a manometer. The experiments showed that epinephrine and norepinephrine induce a contraction and a decrease of pulsatile distensibility of the arterial wall. Priscoline and papaverine as well as sodium nitrate produce opposite reactions. These experiments confirm the previous conclusions of the authors.


On the seventeenth day of quinidine therapy for atrial fibrillation, a 60-year-old man developed blurred vision, a decrease in visual acuity to 20/50 bilaterally, and a 15 to 17 degree constriction of the visual fields. The quinidine dose ranged from 0.2 to 1.0 Gm. daily. After stopping the drug, the visual abnormalities subsided in 3 to 6 weeks. This appears to be the first reported instance of quinidine-induced amblyopia, although similar reactions of quinidine have been observed and were attributed to retinal ganglion-cell ischemia.

Rogers


Acetyldigitoxin, a pure crystalline glycoside of constant potency with an enteral absorption of 67 per cent, has a moderate latent period of 20 to 30 minutes after intravenous administration and 2 to 4 hours after oral ingestion. The average time of dissipation of the drug from the tissues is 5.6 days. Dissipation of side effects is more rapid than with digitoxin. Signs and symptoms of toxicity disappear in 24 to 48 hours. The average total digitalizing dose in 5 patients was 2.08 mg. administered over a period of slightly more than 30 hours. The therapeutic range was 44.2 per cent. The suggested initial dose is 0.4 to 0.8 mg. followed by 0.4 mg. at 6-hour intervals until the desired effect is achieved or toxicity occurs. The average maintenance dose in 24 patients was 0.15 mg. The therapeutic ratio in this group was 58.3 per cent. The greatest value of acetyldigitoxin is in the patient with heart failure who can be digitalized over a 24- to 72-hour period. While its maintenance effect approximates that of digitoxin, its more rapid dissipation with the resultant more rapid reversibility of toxicity would point to an advantage over the older glycoside in the treatment of congestive failure.

Harris


Reserpine orally in average quantities (0.25 mg. 4 times daily for approximately 12 weeks) in normal subjects usually does not increase basal gastric secretion. Reserpine intravenously in doses of 1.0 to 2.5 mg. is a very potent stimulant of basal gastric secretion in man. The tremendous stimulating effect of reserpine intravenously upon gastric secretion apparently is not dependent upon an intact vagal mechanism or upon adrenocortical stimulation.

Bernstein


Reserpine produces signs of reduction in sympathetic tone in experimental animals that are slow in onset and are considered to reflect a partial central suppression of sympathetic predominance. When reserpine was administered intravenously to dogs after they had received high doses of ganglionic-blocking agents, it produced an immediate pressor response. This action, which is opposite to those commonly attributed to reserpine, indicates that it is peripherally evoked by involvement of a sympathomimetic humoral mechanism.

Aviado


Thiamine-deficient baby pigs showed the following patterns: prolonged P-R interval, QT time, and cycle length, sinus arrhythmia, and atrio-ventricular block. Some animals showed cardiac hypertrophy. The mechanism of these cardiac effects was not explored.

Aviado

In the failing cat papillary muscle, postextrastolic potentiation (augmented regular contraction following an interpolated contraction) is not improved by ouabain. This is interpreted to mean that this phenomenon is unrelated to contractile mechanisms that are susceptible to ouabain. The latent period of inotropic action of ouabain is related to elapsed time, rather than to the number of contractions. An opposite conclusion was arrived at by Wilbrandt et al., using the frog heart.

Aviado


Seventeen of 42 patients who received tetrahydrozoline intravenously exhibited an immediate pressor response that lasted an average of 12 minutes. This was followed by hypotension lasting about 3 hours. This diphasic action resembles the diphasic action of epinephrine. The high initial concentration of the drug causes vasoconstriction. When this has worn off, a sufficient concentration to cause vasodilatation may still be present. It is hoped that these studies will stimulate investigation of related drugs for their anti-hypertensive properties.

Aviado


Ouabain increased the force of contraction of isolated guinea pig diaphragms, stimulated directly or indirectly with supramaximal shock. This implies that whatever systems in cardiac muscle are affected by the cardiac glycosides with resultant increased force of contraction are probably also present in skeletal muscle, and hence the latter could reasonably be used in studies on the mechanism of action of these drugs. If skeletal muscle were to be used for such studies, the effective concentrations of the drug for the production of the positive inotropic action should first be established on a contracting muscle preparation.

Aviado


The value of the new digitalis preparation acetyldigitoxin was tested in 23 patients with congestive heart failure: 22 were treated by oral, and 6 by intravenous medication after sufficient control periods and with complete omission of diuretics in order to eliminate possible sources of errors. In all but 4 patients acetyldigitoxin produced rapid and complete disappearance of symptoms and signs of heart failure. The 4 exceptions were the most severe cases complicated by an active rheumatic carditis or multiple pulmonary emboli. Therapeutic effects were achieved within 24 hours on oral administration and 9 to 30 minutes after intravenous injection. Acetyldigitoxin proved valuable in treatment of supraventricular tachycardias which could be stopped within 10 minutes after a single intravenous dose of 1.4 Gm. Signs of toxicity occurred in 3 of the earlier patients in whom a too high dosage was administered, and in 5 patients with active rheumatic carditis. It disappeared usually within 2 to 5 days. Electrocardiographic manifestations of toxicity consisted of bigeminy in 2, paroxysmal ventricular fibrillation in 1, and second degree A-V block in the 5 patients with carditis. The authors conclude that acetyldigitoxin is a good digitalis preparation. When used in the same dosage as digitoxin it is as efficient, acts as rapidly, is less toxic and exerted faster. It is less prone to produce cardiac arrhythmias than other digitalis preparations.

Pick


In the dog anesthetized with sodium barbital, continuous infusion of norepinephrine, sufficient to elevate mean arterial pressure to levels of 50 to 100 mm. Hg above control, produce proportionate changes in cardiac output, but no significant change in total peripheral resistance. The discrepancy between the effects upon cardiac output in the present study and in those upon unanesthetized humans (in which a reduction in output and increase in resistance have been reported) may be attributed to species difference. However, the more intense bradycardia in man may tend to mask the ability of norepinephrine to enhance cardiac output.
PHYSICAL SIGNS

The authors describe a test to establish clinically whether the vessels forming the main arterial reservoir are primarily elastic or whether the tension is being thrown on the inelastic collagen. The differentiation depends upon changes in pulse pressure occurring when the level of diastolic pressure is reduced with little change in stroke volume. Little change in pulse pressure occurs as the blood pressure is reduced without changing stroke volume if the vessels are elastic whereas with inelastic vessels, the pulse pressure drops. It is assumed that, immediately after the inhalation of amyl nitrite, the stroke volume does not change for a limited number of beats while the blood pressure is dropping and the heart rate is constant. Preliminary intravenous hexamethonium prolongs this state. The test was performed on 15 normal and 37 hypertensive patients. Elasticity was assessed by the ratio change in diastolic pressure. In the normal, the average ratio was 16 per cent. Fifteen hypertensive patients had an average ratio of 31 per cent; twenty-two had an average ratio of 97 per cent. The latter group contained the older patients and were regarded as having "inelastic" central arterial vessels.

SOLOFF


Of 100 cases of mitral stenosis studied phonocardiographically and subjected to mitral commissurotomy, 10 showed an early systolic sound appearing 0.07 to 0.14 second after the maximum of the first sound; 8 of these had relative pulmonary insufficiency or stenosis. In some cases this sound became visible after commissurotomy owing to earlier appearance of the first sound. In 81 cases a systolic murmur was present, and in 44 of these relative pulmonary insufficiency or stenosis was present; in 18 of these a systolic thrill was palpable at the pulmonary ostium during the operation. In 6 cases the murmur was transmitted from the mitral area, in 6 it was considered as accidental, and in 8 aortic stenosis was present. A diastolic murmur (Graham Steell) was present in 18 patients, and all showed relative pulmonary insufficiency in that the pulmonary pulse pressure was at least 40 per cent of the systolic pressure. This murmur was present in only some of the cases with pulmonary insufficiency, while a systolic murmur was present in all of these cases.

LEPESCHKIN

PHYSIOLOGY

The authors report quantitative data concerning the relative intensity of the vasoconstriction induced in the foot of normal male smokers, ages 26 to 33 years, under different conditions. Under all conditions of this study, the smoking of 2 cigarettes in 28 of 31 experiments resulted in reductions in foot blood flow ranging from 9 to 55 per cent and averaging 22.3 per cent. Smoking in the warm room, the cool room, and after 24 or 48 hours of abstinence from tobacco caused decreases in foot blood flow of the same general range. This striking similarity of response suggests that these different control levels of vasomotor activity do not alter significantly the vasoconstrictor effects of smoking cigarettes. Under the conditions of this study smoking was a less intense vasoconstrictor stimulus than cooling the environment from 83 to 68 F.

SAGALL


In studies of unanesthetized dogs, hypophysectomy resulted in a decrease in cardiac output, oxygen consumption, and stroke volume. No appreciable change in arteriovenous oxygen difference, mean femoral arterial pressure, or heart rate was observed. Glomerular filtration rate, renal plasma flow, and renal fraction of cardiac output were markedly reduced in the hypophysectomized animals. Renal vascular resistance increased 2- to 3-fold in contrast to a 24 per cent increase in total peripheral vascular resistance. Although a marked reduction in cardiovascular and renal hemodynamic function resulted following hypophysectomy, there was no correlation between the degree of functional change and either the amount of anterior pituitary tissue remaining or the degree of atrophy of the adrenal cortex.

OPPENHEIMER


Normally the left ventricle consumes 25 per cent more oxygen than the right ventricle and
atrium. Hypothyroid animals were observed to have a decreased oxygen use in the atrium and both ventricles. The decrease was about 25 per cent and proportional in all chambers. In hyperthyroidism the increased oxygen use in all chambers was disproportionate.

Oppenheimer


Temperature changes were observed in blood and rectum by thermistors. Dogs were suddenly exposed to ambient temperatures of -35 C. for 30 minutes. During this experimental period blood and rectal temperatures increased approximately 0.5 C. Rectal temperatures were always 0.2 - 0.3 C. higher than that of the left atrium and the latter in turn was higher than that of the pulmonary artery by 0.01 - 0.15 C. It was considered that increased metabolism and vasoconstriction in the skin play a role in the increased rectal temperature observed during exposure to cold. There may be a thermodynamic basis to explain the temperature gradient between left atrium and pulmonary artery.

Oppenheimer


The authors studied the cardiovascular action of cesium on the isolated frog heart, the isolated rabbit atrium, and the dog heart in situ. They observed, as in a previous study with potassium and rubidium, a negative chronotropic and inotropic action. Hypertension appeared and was attributed to increased secretion of epinephrine. However, cesium was less active than the other ions and it was more toxic for the myocardium. In the electrocardiogram sinus bradycardia and sinus standstill with ectopic rhythms, such as ventricular extrasystoles and ventricular tachycardias, were observed.

Scherf


Alterations of ventricular activity following damage of the conduction system by application of a quinine solution to the ventricular septum was studied in dogs. Comparative data concerning time of onset of contraction in different parts of the ventricles were obtained by introducing catheters into the ventricular cavities, the aorta, and pulmonary artery and into the free ventricular walls and by recording simultaneously 5 pressure values and an electrocardiogram as reference. The degree of delay in contraction of a ventricle consequent to a lesion of the homolateral bundle showed a clear dependence on the extent of the alteration of the electrocardiogram. When a typical pattern of right or left bundle-branch block appeared in the electrocardiogram, retardation of contraction of the respective ventricle amounted to 0.03 to 0.35 second. With lesser degrees of prolongation of the QRS interval (15 to 20 per cent) contraction was delayed by only 0.02 second maximally. The activity of the contralateral ventricle remained unaffected.

Pick


Trauma was produced in rats by tumbling in a Noble-Collip type drum. Pretreatment with epsom salts intraperitoneally decreased the mortality. Circulating epinephrine and norepinephrine concentrations were reduced in treated animals. Control animals were observed to have a pronounced decrease in blood volume after tumbling. This change in volume was prevented by pretreatment with magnesium. The opinion is set forth that, since magnesium maintains blood volume, it thus prevents the increase in concentration of catecholamines observed in control untreated rats.

Oppenheimer


An important experimental technic is presented that measures ventricular force directly. Changes in force of contraction and duration of isometric pressure gradient bear a linear relation to each other. The same is true for changes in force and stroke work. Aortic diastolic pressure and left ventricular contractile force developed during isometric contraction are directly related. Contractile force increased as a muscle was stretched to increase 40 to 60 per cent in length, but beyond this the force decreased.

Oppenheimer

When cat papillary muscles contract aerobically in a Krebs-Henseleit bicarbonate solution, glucose is not needed to sustain contraction. Contractions are reduced and ultimately stop under anaerobic conditions, but recover when oxygen is restored. Control muscles behave similarly. Acrobic recovery is greater if glucose is present during the anoxia.


Thyroxine, triiodothyronine, and acute anoxia were used to produce electric alternans. The alternans was usually associated with decreased contractility. It did not seem to be related to rate. Alternation in the single ventricular fibers of the frog involved rate of depolarization and rate of varying combinations. Mechanisms to explain the actions of the agents tested are unknown.


Conductance is the reciprocal of resistance. When the aortas of rabbits were first cut brain conductance decreased slowly for 1 to 5 minutes, followed by a sudden large drop that was closely correlated with the development of the negative cortical asphyxial potential. A further slow decrease of conductance followed until values of 20 to 30 per cent of controls were observed. Cooling from body to room temperature lowered conductance approximately 20 per cent. Removal of fluid from the surface of the cortex and from the lateral sinus had a similar effect to temperature drop. The rapid fall in conductance was considered to be due to movement of ions from an intracellular to an intracellular position. A sudden increase in membrane potential would explain this and the asphyxial potential.


If the atria are opened, an excised rat heart placed in saline will propel itself with each systole. This jet propulsion was observed during systolic ejection from the aorta. In the excised heart fluid was taken in during diastole and ejected during systole. Nonbeating hearts had an inherent elasticity, since they drew in fluid when released from external compression. The author expresses the opinion that part of systolic energy is dissipated during diastole.


The effects of venesection on pulmonary and cardiac function were studied in 11 male patients with chronic pulmonary emphysema and secondary polycythemia. Mean values for all lung volumes measured or calculated were greater after venesection. Increases in functional residual capacity and residual volume appeared to be most consistent. In each of 4 patients studied, there was a fall of cardiac output after venesection of not less than 1 liter per minute. Stroke volume was decreased; arterial oxygen saturation rose; mean pulmonary arterial pressure decreased in 2 of 3 patients. It was concluded that while venesection reduced intrathoracic blood volume, no improvement resulted in ventilatory performance, alveolar ventilation or ventilation perfusion relationships. The value of venesection in such patients could not be established from this study.


Anatomic changes in the lungs were studied.
ABSTRACTS

in 2 groups of autopsied patients to evaluate the possible etiologic role of methonium salts in pulmonary disease. Methonium-treated cases with arteriolar nephrosclerosis were compared with untreated cases with a similar diagnosis and with the findings in the lungs of patients with mitral stenosis. Fibrous pneumonitis was characterized by fibrin masses in the air spaces often associated with a hyalin-like membrane and a tendency to organize. Its occurrence was significantly more frequent in methonium-treated patients (59 per cent) than in untreated patients (36 per cent) but in both groups it was qualitatively similar anatomically. It was rare in untreated nonuremic cases. Nonuremic fibrous pneumonitis found in 8 patients was marked by tachypnea, relative tachycardia, and dyspnea relieved in the supine position. Pyrexia, leukocytosis, alkalosis, or hypotension characterized the terminal clinical episode.

KURLAND

RENAI AND ELECTROLYTE EFFECTS ON THE CIRCULATION


Large doses of desoxycorticosterone acetate did not block an increase in sodium excretion due to mercurial in 2 of 3 dogs. These animals were previously subjected to bilateral adrenalectomy and constriction of the inferior vena cava. Ascites was present. The authors point out that these observations do not support the theory that mercurial unresponsiveness can be explained by increased quantities of a circulating adrenocortical hormone that causes salt retention.

OPPENHEIMER


The effects of intravenously administered hexamethonium on renal function—temporary decreases in glomerular filtration rate and renal blood flow, usually an increase in renal vascular resistance, a decrease in urine flow and sodium excretion—were not modified by preparatory treatment with reserpine.

MCKUSICK


Cystinuria, galactosaemia, and “Hartnup disease” represent 3 forms of renal aminoaciduria that are genetically determined. In cystinuria the urine contains not only grossly abnormal amounts of cystine but also 3 other basic amino acids. Cystine tends to come out of solution and this is presumably the prime factor in stone formation while the others are freely soluble. The cystinuria is renal in character and not due to a block in intermediary metabolism. More than 1 patient with cystine stone formation may not infrequently be found in the same family and apparently more than 1 different abnormal gene may, in homozygotes, lead to a severe failure in the tubular reabsorption of the 4 amino acids. In galactosemia, the patients are unable to metabolize galactose completely and will show high levels of galactose in the blood and urine. Hepatomegaly, cirrhosis of the liver, ataracts, and early death are the rule unless the patient is placed on a galactose-free diet. The urine of such infants contains abnormal amounts of amino acids, not due to overflow associated with liver damage but purely renal in origin, probably due to a build-up of material toxic to the renal tubule. Hartnup disease is characterized by a pellagra-like skin rash with temporary cerebellar ataxia, constant renal aminoaciduria, and other bizarre biochemical features. The pattern of amino acid excretion in this syndrome is quite different from any other and is specific for this condition. Eleven amino acids are excreted in greatly increased amounts compared with the normal, although the plasma concentrations are within normal limits. It seems reasonable that as the causal sequence of events in these and other similar conditions is unraveled, much new light will be focused, not only on the pathology, but also on the physiology of the renal function.
ROENTGENOLOGY


Patent ductus arteriosus (PDA), particularly in infancy, offers a serious diagnostic problem, especially when a continuous or machinery-like murmur is absent, and only systolic or atypical systolic and diastolic murmurs are present. On the other hand, ventricular and aortic sepal defects and also Eisenmenger's complex may be associated with murmurs difficult to differentiate from patent ductus arteriosus. Cardiac catheterization is often useful and diagnostic, but at times it, too, provides inconclusive results. In infancy the likelihood of failure and death from PDA is greater than the over-all mortality incidence, particularly when associated with ventricular atrial and septal defects. Electrocardiographic and conventional roentgenologic methods are often less helpful than required to establish the diagnosis. Conventional angiography may be helpful in terms of indirect signs (aortic infundibular and pulmonary artery dilatation, left ventricular and left atrial enlargement, persistence of opacification, and re-opacification of the pulmonary artery). Only rarely is it as conclusive in terms of direct opacification of the ductus, the demonstration of contrast filling defects from nonopacified aortic blood (generally in diastole) as is the rapid serial angiography (6 to 12 frames per second) employed by the authors. Selective angiography with injection of the opaque substances through a catheter under considerable pressure, offers even greater possibilities for a nonequivocal diagnosis. The authors have employed this technique not only with rapid serial films, but with cineradiography combined with image intensification. Two simultaneous projections at a 90-degree angle with each other plus electrocardiographic timing offer physiologic as well as diagnostic data. One of the interesting findings indicative of the value of the method is the statement that diastolic shunts from aorta to pulmonary artery may exist even in the absence of diastolic murmurs.

ROENTGENOLOGY


While calcification within the wall of the ascending aorta is commonly found in patients with syphilitic aortitis the author focuses his attention on this finding in 4 of 20 such patients who had no syphilis, clinically, serologically, and ultimately at postmortem examination. Differentiation between syphilitic and the nonsyphilitic aortic calcification was possible on the basis of demonstrable absence of dilatation of the ascending aorta in elderly patients with negative serology.

SCHWEDEL


The authors present the sites at which coronary artery calcifications should be observed when present, and report 6 instances in which calcification of the left descending and circumflex branches were demonstrated. Only 1 of the 6 had definitive electrocardiographic evidence of coronary occlusion. The mentioned sites are: just inside the upper left ventricular margin in the posterolateral position and anterior to the atroventricular groove in the left anterior oblique position for the left descending and circumflex branches; inside the upper cardiac contour in left anterior oblique position and anterior to the right atrium in the right anterior oblique position for the right coronary artery. Characteristically these calcifications have the appearance of linear streaks and interrupted plaques arranged in parallel segments.
ABSTRACTS


Three new cases of unperforated aortic sinus aneurysms were diagnosed antemortem by roentgenographic studies. In the first, a 7-year-old child, the aortic sinus aneurysm believed to be of congenital origin, was associated with mitral and aortic stenosis. The 2 other patients had acquired syphilitic aortic sinus aneurysm. Diagnosis was established by angiocardiography, and confirmed in 1 by postmortem examination. The authors stress the relatively benign course of such aneurysms occurring on a syphilitic basis. However, the danger of rupture in these, as well as in the congenital types (including those occurring with arachnodactyly), indicates the need for early surgery which, at present is not yet practical.

Schwedel


The authors review the roentgenographic findings in 124 patients with mitral disease and attempt to correlate the findings with maximal systolic pulmonary artery pressures as determined by cardiac catheterization. The main pulmonary artery segment was classified as being normal or slightly enlarged (grade 1) and generally corresponded to pulmonary artery pressures of 50 mm. Hg or less; grade 2 and grade 3, indicating moderate or marked pulmonary artery dilatation correlated 92 per cent of the time with systolic pulmonary artery pressures exceeding 51 mm. Hg, but no linear correlation was possible. The authors conclude that if the sole purpose of cardiac catheterization is to determine pulmonary artery pressures, it is probably an unnecessary procedure when enlargement of the pulmonary artery segment is moderate or marked. However, when the pulmonary artery segment is normal or slightly enlarged, then pulmonary artery hypertension (above 50 mm. Hg systolic) can be excluded only by cardiac catheterization.

Schwedel


Direct transthoracic needle puncture opacification of the left and right ventricles was performed 77 times in 60 patients. The chief reason for such a procedure was to demonstrate mitral or tricuspid valvular insufficiency; accessory reasons included localization of extent of localized ventricular bulge (ventricular aneurysm), visualization of the aortic and mitral valves and aortic aneurysms. The procedure was monitored by a 1-lead electrocardiogram and by intracardiac pressures. The left ventricle was entered directly half of the time, in the other half the needle traversed the right ventricle and the interventricular septum as well. Diagnostic results were obtained in about 90 per cent of the successful procedures, including data on gradients between left ventricular and aortic pressures. In 8 instances at least some portion of the injected opaque substance appeared within the myocardium with permanent residual damage in only 1 patient (heart block). Slight to moderate pericardial effusions occurred 11 times, in 1 there was 400 ml. of blood. Various arrhythmias occurred frequently, both during the passage of the needle and presumably secondary to jet effects of the injection on adjacent endocardium. The problem of intrapericardial and intramyocardial injections is discussed and methods for obviating such complications are presented.

Schwedel


The authors discuss the anatomic and physiologic components of the Eisenmenger complex: a large high ventricular septal defect with aortic overriding of variable degree, increased pulmonary vascular resistance with consequent pulmonary hypertension, a shunt of right ventricular blood into the aorta. Deformed aortic cusps, a dilated pulmonary artery and chamber enlargements were secondary or associated features. Significant catheterization data in 12 patients included marked elevation of right ventricular and pulmonary artery pressures without a gradient between the 2 and equalization of these pressures with systemic pressures, usually with bidirectional small shunts. Conventional roentgenography indicated that gross cardiac enlargement may or may not be present and in this group most of the cardiac silhouettes were not strikingly enlarged. The main trunk of the pulmonary artery was almost always prominent, the secondary (hilar) branches were also dilated. The tertiary and quaternary branches on the other hand seemed to shrink with increasing age, or under prolonged observation, suggesting actual pulmonary arterial narrowing (associated with pulmonary arterial hypertension). Right ventricular enlargement, less frequently right atrial enlargement, no left ventricular or
atrial enlargement were the other roentgenologic features. Angiocardiography was helpful in that aortic opacification occurred before that of the left ventricle. Differential diagnosis between Eisenmenger's complex and other congenital cardiac anomalies that had progressed to the stage of or were associated with a right-to-left shunt were presented; these included atrial septal defect ventricular septal defect, patent ductus arteriosus, and primary pulmonary hypertension.

**SCHWEDEL**


The roentgenographic findings were reviewed in 20 proved cases of isolated ventricular septal defect, excluding those with a right-to-left shunt. Ten per cent had marked cardiac enlargement, in 40 per cent this was moderate. Right ventricular enlargement occurred in 85 per cent, left ventricular enlargement in 65 per cent. Almost half had left atrial enlargement. All but 1 of the patients had widening of the main pulmonary artery, 85 per cent had increased prominence of the peripheral pulmonary vascularity. Seventy per cent had demonstrably enlarged pulmonary veins. None had aortic dilatation. Ventricular septal defect, in the view of the authors, may be differentiated roentgenographically from atrial septal defect by the absence of left-sided enlargement in the latter condition, and from patent ductus arteriosus in which the aorta is enlarged. Such enlargement is rare in ventricular septal defect.

**SCHWEDEL**

**SURGERY AND CARDIOVASCULAR DISEASE**


External electric pacemaker stimuli were applied through an esophageal electrode in 26 adult subjects with normal sinus rhythm. In 10 patients the procedure was done during anesthesia and surgery. Impulses of less than 20 volts were ineffective, while impulses of 30 to 50 volts at a rate of 80 to 120 per minute were very effective. In all 10 surgical patients, the heartbeat was taken over by the pacemaker during the operative procedure. Upon discontinuance of the pacemaker, prompt reversion to normal sinus rhythm occurred in every patient.

**ENSELBERG**


In this article 7 cases with death from an unusual cardiac cause after operations for mitral or aortic deformity were presented with the pathologic findings. These included ball-valve action on a surgically produced mitral regurgitation in an atrial cavity occupied by a large thrombus; an undiagnosed case of Lutembacher's syndrome; traumatic removal of a large atrial thrombus; emboization to the right posterior vertebral artery; a surgically ruptured chorda tendinea of a relatively patentous mitral valve; cardiac arrest in a patient with coronary disease but no aortic stenosis as thought preoperatively; and the trauma on the heart superimposed postoperatively by the necessity of re-entering the chest and pericardial cavity because of postoperative bleeding. These cases point out some of the new problems that are becoming evident as the causes of death in patients undergoing mitral or aortic valve operations now that improvement of surgical technic has removed that factor as the most common cause of death in these patients.

**SAGALL**


The case of a man aged 33 years is described in detail. This patient had many of the skeletal and ocular manifestations of Marfan's syndrome. After a series of accidents in which the thorax was struck bluntly, the patient developed the murmur and pulsatile abnormalities of aortic insufficiency together with severe pain in the chest. A Hufnagel valve was inserted into the descending aorta. The patient died of heart failure 4 months after the surgical procedure. The postmortem examination disclosed typical cystic medial necrosis of the aorta. There was a healed intimal tear 3 cm. above the aortic ring. The aorta below this tear measured 16 cm. in circumference, whereas 4 cm. distal to it the aorta measured 7.5 cm. in circumference. There was fenestration of 2 of the aortic valve cusps. At the inlet and outlet of the prosthetic valve the intima had piled up in such a way as to cause almost complete obstruction of the lumen. This acquired coarctation was believed to have added to the load upon the left ventricle in such a way as to cause the progressive congestive heart failure. Because the patient had tearing, grinding pain in the chest at the time of one of the
accidents and subsequent evidence of aortic insufficiency, the authors are of the opinion that the tear in the intima of the aorta and the fenestration of the aortic valve cusps were traumatic in origin or precipitation.

Rosenbaum


Three patients with mitral stenosis and aortic valvular disease are described. Mitral commissurotomy was performed in these patients and within 2 years there developed increasing congestive heart failure and death. The authors postulate a series of dynamic events when mitral obstruction is relieved in the presence of uncorrected aortic valve lesions. It is believed that if the mitral commissurotomy improves the rate of flow into the left ventricle, hemodynamic balance is maintained by a more rapid flow across the aortic valve. This greater flow results in a rise in the pressure gradient, a sequence that initiates myocardial hypertrophy. A second phase in the sequence of events occurs when the myocardium loses contractility, possibly due to alterations in coronary blood flow secondary to myocardial hypertrophy. In this phase the ventricle enlarges, the muscle fibers “overstretch” and a severe demand for energy output is made to sustain the necessary pressure gradient. Progressive left-sided failure and ultimately right-sided failure appear during this phase. If there is aortic valvular insufficiency as well as stenosis the diastolic volume of the left ventricle is increased by both the aortic regurgitation and the improved rate of flow through the larger mitral orifice and an even greater tension is required in the “stretched” myocardium to sustain an adequate pressure gradient across the diseased aortic valve. The authors suggest that if in the operating room a significant increase in the gradient across the aortic valve is demonstrated after relief of mitral valvular obstruction, there is probably need for a concomitant aortic commissurotomy.

Rosenbaum


This important area in the field of vascular surgery, having been opened in 1949, is yet in a developmental stage. An increasing variety of materials is being successfully used for arterial grafting including arterial homografts and heterografts, venous autografts, and synthetic products of solid or woven construction. Homografts seem superior for treating peripheral segmental arterial occlusion, while in aortic or iliac grafting similar results may be obtained with suitable synthetic material. Venous autografts are used only as peripheral arterial replacements. Bovine and equine heterografting is in the animal testing stage; and, since they incite considerable inflammatory reaction, these grafts are more prone to rupture or thrombosis than those of other sources. Of the synthetics, Dacron—because of its stable tensile strength, inertness, low water uptake, and ease of use—is presently favored somewhat over Nylon, Vinyon-N, Orlon, or Teflon. These substances are woven or braided into porous tubes that in situ become reinforced by the infiltration of fibrous tissue. Greater care is required in the placement of a synthetic than a natural graft; and failures have resulted primarily from thrombosis, probably related to inelasticity and buckling. The success of a graft often depends more on clinical judgment in the selection of the patient and on the surgical technic than on the type of graft used.

Rogers


Ventricular septal defects were created in hypothermic dogs (27 C.) by means of a hemostat or scalpel incision sufficient for the placement of a lucite tube 7 to 12 mm. in external diameter. In the 10 dogs receiving a defect in the ventral portion of the septum, either immediately below the pulmonic valve or at a midseptal level, the electrocardiogram remained normal for as long as 21 months, despite the existence of a left-to-right shunt. In the 42 dogs having a defect created in the dorsal septum at the septal crest (where human congenital septal defects often occur and where the right bundle-branch courses), right bundle-branch block was found postoperatively in 19, persisting in 17; and complete heart block was found in 12, persisting in 6. These conduction disturbances were attributed to the direct injury of grossly identifiable components of the conducting system and were believed to be unrelated to the hypothermia.

Rogers


Teflon arterial grafts in 60 dogs were observed for as long as 6 months. All of 18 thoracic aortic grafts, fashioned by a sewing machine from Teflon weaves of types TF-208 and TF-210, functioned well. Of 30 abdominal aortic grafts made of
woven Teflon tubes, 27 remained patent, and 3 thrombosed 2 to 3 weeks after their insertion. Eleven of 12 Teflon tubes 4 mm. in diameter used as carotid or femoral grafts became thrombosed, and the author doubts that any of the synthetic materials now in use will serve satisfactorily for replacing vessels less than 5 mm. in diameter. The author considers Teflon grafts superior to those of Dacron, Orlon, Nylon or Ivalon sponge because of Teflon's maintenance or actual gain of high-tensile strength and its incitement of less tissue reaction. The pretreatment of Teflon by boiling in concentrated nitric and in sulfuric acid is desirable, since tissue reaction is reduced and healing is more rapid while tensile strength is not significantly lowered. Stiffness is a shortcoming of Teflon that may be overcome if it can be produced in smaller fiber size.

Ensberg


Experimental and clinical efforts aimed at revascularization of the myocardium are reported. A brief review of the problem of coronary artery disease and previous efforts at producing myocardial revascularization precede the presentation of the experimental and clinical data.

The experimental work was carried out on dogs and consisted of ligation of the coronary arterial system at different points and the preparation of the hearts, after death, by an injection-corrosion technic to demonstrate anastomoses. One-half of all normal dog hearts showed excellent anastomoses—indeed some appeared to have as rich an arterial vasculature as the "after-operation" specimens published by others. Multiple ligations of small twigs near the apex was associated with a mortality rate of 20 per cent between 24 and 72 hours after operation. Ligation of the descending branch of the left coronary artery yielded a 23 per cent mortality rate. In the latter group, the animals that survived were subsequently autopsied and a marked adhesive pericarditis was found. In the animals that died it was found that the septal branch had also been ligated along with the descending branch of the left coronary artery. More than half of the animals autopsied 3 to 5 weeks after complete coronary sinus ligation showed a diminished number of venous channels in the myocardium and a richer arterial vasculature. Autopsy 6 to 12 months after ligation of the coronary sinus did not reveal a rich myocardial arterial tree.

Coronary sinus ligation with cardiopercardiopexy was performed in 5 patients. Brief summaries of these cases indicate improvement in all 5 patients and 1 late mortality occurring 1 year after surgery.

Brothers


The physiologic and pathologic changes occurring in 13 dogs following complete excision of the pulmonary valve were studied. None of the dogs developed right-sided failure or an increase in systemic venous pressure in the 6- to 10-month period between operation and autopsy. Dilatation and hypertrophy of the right ventricle occurred. Hypertrophy was demonstrated by changes in the weight ratios of right to left ventricle and heart to body weight. The right ventricle was heavier than the left in 6 dogs. Four dogs were able to withstand 20 minutes of exercise daily, on a treadmill at 6 to 8 miles per hour, without apparent ill effect. Preoperative and postoperative cardiac catheterization studies were performed in 11 dogs. The right ventricular pressure was increased by 9 mm. Hg or more in 7 animals and virtually unchanged in 4. Pulmonary artery pressure was increased in 8 and could not be obtained because of technical difficulties in 3. Cardiac output was increased in 4 animals and decreased in 4. In view of the very definite structural changes apparent in the hearts after sacrifice, cardiac failure would very likely have been the ultimate fate of the animals.

Brothers


The authors describe a method of perfusing the coronary and carotid arteries from a reservoir of heparinized arterial blood during carotid by-pass in dogs. This method was tried because of discouraging experiences when the entire animal was perfused. In the early experiments, with the aorta and both brachial arteries clamped, cord damage occurred after a few minutes. However this was minimized when hypothermia was employed. Hypothermia was found to be relatively safe, so far as ventricular fibrillation was concerned, when rectal temperatures were maintained at 30 to 32 C. Neither pulmonary artery perfusion, digitalization, nor inflation of the lungs appeared to be important factors in influencing survival rate. Blood pressure had to be maintained at a level of at least 85 mm. Hg during the by-pass period. In the last 25 experiments it was possible to open the right ventricle for 30 minutes in a group of 21 long-term survivors.

Ensberg