ABSTRACTS

Editor: Stanford Wessler, M.D.

Abstracters

Jonas Brachfeld, M.D., Philadelphia
I. J. Fox, M.D., Rochester, Minnesota
John Helwig, Jr., M.D., Philadelphia
Robert Kalmansohn, M.D., Los Angeles
Harold Karpman, M.D., Los Angeles
Herbert J. Kayden, M.D., New York
Seymour Krause, M.D., Pittsburgh
George S. Kurland, M.D., Boston
Eugene Lepeschkin, M.D., Burlington
Robert J. Luchi, M.D., Philadelphia
R. J. Marshall, M.D., Rochester, Minnesota
J. Earle White, M.D., Durham

Morton H. Maxwell, M.D., Los Angeles
Henry N. Neufeld, M.D., St. Paul
Milton H. Paul, M.D., Chicago
Louis Rakita, M.D., Cleveland
Stanley M. Reimer, Ph.D., Boston
Wayne R. Rogers, M.D., Portland
Lawrence R. Ross, M.D., Salt Lake City
Elliot L. Sagall, M.D., Boston
Miltiades Samartzis, M.D., Athens, Greece
Salvatore M. Sancetta, M.D., Cleveland
Sheldon Sheps, M.D., Rochester, Minnesota

ATHEROSCLEROSIS


Among 10 patients with hypercholesteremia on an unrestricted diet, large doses of nicotinic acid were found to be more effective in lowering plasma cholesterol than either safflower oil or sitosterol. When nicotinic acid and sitosterol were combined in treatment, the observed effects were nearly additive. It is pointed out that from a practical point of view nicotinic acid is inexpensive, simple to administer, and does not require alterations in the patient's dietary habits. This drug may therefore prove to be of value in hypercholesteremia when the safety of its long-term use has been established.

Sagall


Aortic implants were placed in the anterior eye chamber of 30 rabbits subsequently fed excess cholesterol and cottonseed oil. After 3 months of such feeding, 7 of these animals were sacrificed, and their implants and also segments of their own aorta were analyzed for cholesterol. Two more groups of these rabbits were sacrificed 2 and 3 months, respectively, after their return to a cholesterol-free diet. It was observed that the aortic as the host's own aorta at the end of the cholesterol feeding period. This difference became even greater in animals that were sacrificed 2 months after cessation of excess cholesterol feeding, but were still hypercholesteremic. However, the ocular implants of rabbits examined 3 months after cessation of cholesterol feeding were observed to have lost almost all of their cholesterol, whereas the animal's own aorta continued to exhibit an unchanged excess of cholesterol. The findings suggest that the ocular aortic implant differs markedly from the aorta in situ in regard to its penetration and retention of cholesterol.

Kayden


The serum level of Sf 0-12 lipoproteins (rich in cholesterol esters) is established by saturated fats, while that of Sf 12-400 lipoproteins (rich in neutral fat) is determined by the carbohydrate content of a diet. This implies that the serum cholesterol level can be reduced by restricting saturated fats from the diet. If the saturated fats are replaced by carbohydrate, the Sf 12-400 lipoprotein and neutral fats will rise. However if
unsaturated fats are used to replace the saturated fats this rise will not occur. By the use of an unsaturated fat diet, patients with ischemic heart implant gained almost twice as much cholesterol disease demonstrated lower levels of serum cholesterol, low-density lipoprotein, and SF 0-12 and SF 12-400 lipoproteins. This was accomplished more efficiently without loss of weight than when low-fat diets were used. Furthermore the unsaturated fat diet was less monotonous and was better accepted.

KRAUSE

BLOOD COAGULATION AND
THROMBOEMBOLISM

Mersky, C., Gordon, H., Lackner, H., Schrire, V.,
Kaplan, B. J., Sougin-Misbashan, R., Nosel, H. L., and Moodie, A.: Blood Coagulation and
Fibrinolysis in Relation to Coronary Heart Dis-

Healthy white men and white men with evidence of coronary artery disease were age-matched and studied relative to various coagulation factors. The patients with coronary disease differed from the control subjects only in having a higher plasma-fibrinogen level in the age group over 50. These same coagulation factors were studied in healthy rural Bantu men and in age-matched healthy urban white men. The Bantu had lower plasma-prothrombin and serum-factor-VII levels, better prothrombin consumption, and higher plasma levels of factor VIII. They also formed more plasma thromboplastin and their fibrinolytic activity was greater than in the control group. There was no difference found in thromboplastin generation when the Bantu was compared to the patients with coronary artery disease. Speculations are made on the significance of these observations in relation to atherogenesis.

Krause

Preziosi, P., Bianchi, A., De Vleeschhouwer, G. R.,
and De Schaedlyver, A. P.: On the Pulmonary
and Cardiovascular Effects of Warfarin So-
dium. Arch. int. pharmacodynam. 123: 227 (Dec.),
1959.

In the isolated guinea pig lung, Warfarin was found to have no neumodilator effect and did not antagonize the pneumoconstriction induced by various agents. These findings did not support the observations of Blumberg et al., who noted a bron-
chodiator action with the tracheal ring techie. The activity of the isolated guinea pig heart was not notably altered by Warfarin in doses of from 1 to 500 µg., whereas doses over 2,500 µg. pro-
duced a marked negative inotropic effect propor-
tional to the dose. Intracoronary injection of 0.5
to 2 mg./Kg. of Warfarin produced an increase
in coronary blood flow in dogs. Warfarin was found to be 10 to 20 times less potent than papaverine in this respect. Injection of 0.5 to 5 mg./Kg. of Warfarin into the peripheral end of the femoral artery of the dog produced an increase in femoral blood flow, which was also less pro-
nounced than papaverine. These vasodilator effects were attributed to a direct myolytic action of Warfarin. Tone and motility of isolated rabbit duodenum and guinea pig colon were reduced by Warfarin in concentrations as low as 1.2 × 10^−5 and 2.4 × 10^−4, respectively. Spastic contractions of the colon, produced by barium chloride or syn-
thetic hypertensin were partly counteracted by Warfarin (4.4 × 10^−4).

Brachfeld

CONGENITAL ANOMALIES

Dadswell, J. V.: Congenital Anomaly of the Left
Circumflex Coronary Artery. J. Path. & Bact.
79: 204 (Jan.), 1960.

A case report is presented of a 72-year-old man who died of bronchopneumonia and at necropsy was found to have a congenital anomaly of the left circumflex coronary artery. The descending branch of the left coronary artery arose from the left posterior aortic sinus and pursued a normal course, descending in the anterior intraventricular groove to the cardiac apex. The circumflex branch arose from the anterior aortic sinus along with the right coronary artery by means of a common ostium and passed posteriorly to the left to reach the atrio-
ventricular groove. The author reviewed the few reported instances of anomalies of this type and noted that since the greater portion of the pos-
terior surface of the ventricle was supplied by the right coronary artery or the anomalous left cir-
cumflex artery, an occlusion of their common orifice would have been more severe than in a heart with a normal coronary distribution.

Karfman

Dammann, J. F., Jr., Thomson, W. M., Jr., Sosa,
O., and Christlieb, I.: Anatomy, Physiology
and Natural History of Simple Ventricular
Septal Defects. Am. J. Cardiol. 5: 136 (Feb.),
1960.

Isolated ventricular septal defects were de-
scribed in terms of their development, structure, and clinical features; and 9 illustrative case re-
ports of young persons were presented. The defect is not detrimental to the fetus but commonly be-
comes symptomatic in infancy unless its diameter is small. Small defects are detectable principally by finding a long, loud, systolic murmur at the mid or low left sternal border with little or no other abnormality being observed. The manifesta-
tions of moderate or large (diameter over 1 cm.

Circulation, Volume XXIII, January 1961
per square meter of body surface) defects depend chiefly on the degree of right ventricular outflow obstruction and therefore the size and direction of the shunt. In infancy these defects usually produce a large arteriovenous shunt which leads to decided enlargement of the left side of the heart and commonly to heart failure. As the child grows the defect becomes relatively smaller and consequently the shunt and the danger of heart failure are likely to lessen. When the pulmonary blood flow is very high, the capacity of the arterioles to dilate is exceeded so that slight pulmonary hypertension often occurs. Later in childhood, even with less voluminous flow rates, the arterioles tend to narrow and their walls thicken resulting in pulmonary pressure rises that may reach systemic levels. In such situations, the arteriovenous shunt decreases and venoarterial shunting and cyanosis appear (Eisenmenger’s syndrome). The electrocardiogram changes from that of left atrial and ventricular flow overload to one showing predominantly right ventricular pressure overload, and the roentgenogram discloses diminishing pulmonary vascularity and a smaller heart. Cardiac catheterization, previously important for diagnosis in general, is indicated at this time to distinguish this syndrome from the clinically similar one in which the right ventricular outflow obstruction is due only to muscle hypertrophy in this region. The need for surgical closure of the defect before the development of severe pulmonary hypertension was noted, and the value of thorough and frequent observation of the patient was stressed.

ROGERS


As a result of cardiac catheterization in 55 patients with cyanotic congenital heart disease, the following conclusions are made: The effective venous oxygen reserve (cc./min./sq.m.) was considerably reduced in spite of polycytemia (20.3 Gm. average hemoglobin). The average effective pulmonary flow was 1.85 L./min./sq.m. while the critical flow was 0.95 L. The possible reduction of effective pulmonary flow to critical levels was 33-55 per cent. The hemoglobin concentration necessary to guarantee an oxygen concentration above critical values was on the average 11 Gm. per cent, while the concentration necessary to keep the oxygen concentration above reaction threshold was on the average 11 Gm. per cent. As most patients with cyanotic congenital heart disease have relative anemia, therapeutic blood-letting should be avoided as far as possible, and all diagnostic procedures causing physical strain, including angio-

cardiography and cardiac catheterization, should be carried out under careful circulatory control.

LEPESCHKIN


The preoperative cardiac catheterization data in 26 patients with isolated ventricular septal defects were correlated with findings at open-heart surgery. The size of the defect was thought to be the major determinant of the hemodynamic changes, and analysis of these changes permitted an estimation of the defect’s diameter. A higher right ventricular systolic pressure tended to accompany a larger defect, but the pressure correlated better with an index of defect diameter divided by maximum transverse heart diameter. The arteriovenous shunt size was related parabolically to the right ventricular systolic pressure. Defects of less than 1 cm. in size and those associated with right ventricular systolic pressures greater than 90 mm. Hg were considered to be unsuitable for surgery.

ROGERS


Congenital heart disease was studied in 173 mongoloid children. Of the 51 patients who died, autopsies were completed on 44 and congenital heart disease was found in 36.4 per cent of the autopsied group. The mean age at death was 3.2 years, and the chief cause of death bronchopneumonia. Congenital cardiac defects were detected clinically in 11 of the 122 living mongols. A history of maternal illness was present in 11 out of 16 autopsy cases and 3 out of 11 clinical cases of congenital cardiac malformations. Higher birth weights and no premature births were found in the mongols with congenital heart disease, whereas no difference was found in birth rank or in parental age between the groups with and without cardiac defects. Among the various cardiac lesions, ventricular septal defects were the most common followed in frequency by atrial septal defects, patent ductus arteriosus, and then by a group of less common miscellaneous lesions.

KARPMAN


Dye-dilution curves in right-to-left and left-to-right shunt, based on investigations in 20 cases of congenital malformation of the heart are reported,
In atrial septal defect a small right-to-left shunt was often found, which disappeared after inhalation of oxygen. In patients with a high ventricular septal defect a noteworthy finding was variations with respiration of arterial oxygen saturation; this was attributed to changes in position of the septum below the overriding aorta. The effect of the Valsalva maneuver on arterial oxygen saturation in the presence of intracardiac shunts is also described.

BRACHFELD


A history of congestive heart failure was obtained in 17 out of 125 pediatric patients with ventricular septal defects. In each case, the initial symptom of congestive heart failure occurred between 1 and 6 months of age; 10 of the patients had persistent heart failure and eventually died before the age of 1. Clinical and laboratory studies in these 17 patients provided evidence of large left-to-right shunts with an increase in pulmonary blood flow; there were no observations of prognostic significance which distinguished between those patients with ventricular septal defects who, after developing cardiac decompensation, adapted to their disease and survived, and those who progressed with a fulminating course to death. The authors state that the guarded prognosis of infants who develop congestive heart failure warrants consideration of surgical intervention. They concluded that exacerbations of decompensation after infancy were rare; patients who survived the first year of life did not succumb to complications of the defect in childhood.

KARPMAN


Electrocardiographic observations on 100 patients with surgically proved secundum type of atrial septal defect and on 33 with the ostium primum type of atrial septal defect are presented. An rsR' configuration (with a QRS duration of less than 0.11 second) in lead V1 was found to be the most reliable single electrocardiographic change in both varieties of atrial septal defects. This pattern is called "right ventricular outflow tract hypertrophy" and is thought to arise from actual hypertrophy or dilatation of this portion of the right ventricle rather than from an interruption of conduction in the right bundle branch. In a smaller number of patients, an Rs or QR pattern was found in lead V1; in others, there was complete right bundle-branch block. These changes, however, did not help in diagnosing the type of atrial septal defect. In differentiating the secundum from the primum defect, the mean QRS axis and the rotation of the QRS vector loop were found to be of cardinal importance. True right axis deviation (mean QRS axis or vector more than +100° rightward) was present in 81 per cent of the secundum defects and in none of the primum defects. In all 100 patients with secundum defect, the mean QRS axis fell between +50° and 180° and the QRS vector loop was clockwise and below the isoelectric line (0-180°). Left axis deviation (mean QRS axis or vector more leftward than −30°) was present in 82 per cent of the ostium primum defects and in none of the secundum defects. The mean QRS axis fell between 0° and −100° in 90 per cent of the primum defects. In 27 patients with ostium primum defects and true left axis deviation, the QRS vector loop was rotated counterclockwise and was above the isoelectric line (0-180°). The terminal QRS vector fell between +120° and 150° in 91 per cent of the secundum defects and between −60° and −140° in 91 per cent of the ostium primum cases. Following surgical closure of the secundum defect the R' usually decreased significantly within 2 to 4 months. In the absence of such regression the possibility of incomplete closure of the defect or of the presence of irreversible pulmonary vascular changes should be considered.

SAGALL


Three patients with Ebstein's anomaly of the tricuspid valve are described. One of these had typical findings of cyanosis, round right atrium, wide P waves, a wide late R' in V1-3 designated as P' and attributed to activation of the atrialized part of the right ventricle, and an early systolic extra sound attributed to contraction of this part. The second patient showed incomplete right bundle-branch block and the systolic extra sound with less characteristic other signs, but intracardiac electrocardiograms showed a zone with right atrial pressures and absence of an atrial intrinsioed deflection; this is an important diagnostic sign. The third patient showed no characteristic radiologic findings and a QRS complex of normal duration with an R' wave only in V1-V3, but an early systolic extra sound. The diagnosis in this patient was made when, during withdrawal of the intracardiac catheter, atrial pressure curves followed pulmonary artery curves directly, without ap-
pearance of right ventricular curves. This behavior is explained by displacement of the tricuspid valve opening toward the pulmonary artery.

LEPESCHKIN

CORONARY ARTERY DISEASE

Observations are reported concerning 1913 male employees of the State of New York, primarily white office workers, who were followed with periodic clinical examinations for 44 months with particular emphasis on their cardiovascular systems. Initially, it was found that 37 out of 1,000 suffered from ischemic heart disease. For the 44-month period of study the average annual incidence rate of ischemic heart disease was 8.5 per 1,000 per year with most of the new cases being manifested by myocardial infarction or angina pectoris and only about one sixth by an abnormal electrocardiographic response to exercise. Although extremes of diastolic blood pressure, of obesity, and of serum total cholesterol were found in individual cases, there was no correlation of these factors with an increased risk of developing ischemic heart disease. It is concluded that available clinical and laboratory technics do not permit accurate individual prognostication of the risk of ischemic heart disease.

SAGALL


Three hundred and twenty-six patients with myocardial infarction were divided into 2 groups: 220 patients with clinical and electrocardiographic data and 106 patients with anatomic information including coronary arteriography, dissection of the coronary arteries and spatial reconstitution of the infarcted area. Prolonged PQ conduction time was found in 18 per cent of the first group of patients and in 24 per cent of the second group. The frequency was almost identical in occlusion of the left anterior descending and right coronary artery. No particular pattern of arterial distribution was found. Septal and atrial arteries were generally visualized by coronary arteriography. Second- and third-degree block was found in 1.4 per cent of the first group of patients and in 5 per cent of the second group. Obstructing lesions of both right coronary and anterior descending arteries were always found, and they partially explained the gravity of the outlook in infarction associated with second- and third-degree block. The role of the anastomotic circulation is discussed.

BRACHFELD


Coronary circulation was studied in 50 patients by catheterization of the coronary sinus and measurement of coronary blood flow by the nitrous oxide technic. A second measurement was made following sublingual administration of nitroglycerin in 37 patients and duration exercise in 15. Of the group of 50 patients, 10 had normal hearts and 23 had the anogonal syndrome. Coronary flow was shown to depend upon the need for oxygen by the heart, and this was related to the hemodynamic and metabolic factors at any moment. Flow was determined by aortic perfusion pressure, duration of diastole and vascular resistance. In the normal subject, coronary blood flow doubles following the administration of nitroglycerin, with a 50 per cent decrease in coronary vascular resistance. In the presence of coronary artery disease with angina pectoris, coronary blood flow shows little change with nitroglycerin; coronary vascular resistance is virtually fixed. It is suggested that the beneficial effects of nitroglycerin in patients with coronary artery disease is probably attributable to a diminution in the contractility of the myocardium and modification of cardiac venous return. The fall in cardiac output and fall in blood pressure represent a fall in cardiac work. In patients with angina and depressed S-T segments on exercise, myocardial ischemia was evidenced by a fall in coronary venous oxygen saturation and the appearance of both pyruvate and lactate in coronary venous blood.

KAYDEN


Cavodil (beta-phenylisopropyldihydrazine), a hydrazine analogue of amphetamine, is a potent inhibitor of monoamine oxidase. The action of cavodil is prolonged, and the effects of a single dose may last for 7 to 10 days. The use of this drug is reported in 28 patients with angina pectoris using the double-blind technic. Forty-one per cent of the group improved with cavodil alone and received no benefit from the placebo. In many instances improvement did not become apparent for 3 weeks. Only 1 patient improved with the use of the placebo alone. Side effects were mild and in no instance was it necessary to modify the regimen. The chief undesirable effects that did occur were 7 instances of mild transient dizziness and this was associated with postural hypotension in 4 instances. Five patients complained of a dry
mouth while on the medication. The results were encouraging and suggested that eavodil may become a useful drug in the management of angina pectoris.

KRAUSE


Assays of the serum lactic dehydrogenase (LDH) were performed on 1,250 occasions on a total of 500 hospitalized patients. The results were studied in regard to the usefulness of this measurement in the diagnosis of acute myocardial infarction. The serum LDH activity was significantly elevated in the 28 patients in whom the diagnosis of acute myocardial infarction was confirmed by autopsy and in all of the 66 patients in whom the diagnosis was established by classic electrocardiographic criteria. In this series there were no false-negative results in every proved case of myocardial infarction. In most of these patients a significant increase of serum LDH activity was detected within 12 hours after the onset of acute infarction. Abnormal values persisted until the tenth day, with the maximum rise occurring from the second through the sixth day. Thus, an increased serum LDH activity was found to be strong confirmatory evidence of acute myocardial infarction when the disease was suspected. Normal LDH activities were found in those patients who clinically were thought to have acute myocardial infarction, but in whom the diagnosis was disproved by autopsy. Elevated serum LDH activity was not limited to acute myocardial infarction, but the presence of an abnormal LDH activity always denoted serious disease. It is of interest that in this series 7 of 11 patients with congestive heart failure, but without myocardial infarction, showed elevated serum LDH levels. The observations of this study warranted the conclusion that the serum LDH serves its most useful purposes when other diagnostic parameters of acute myocardial infarction are atypical and that the addition of this method to those currently employed should permit the accuracy for the diagnosis of acute myocardial infarction to approach 100 per cent.

SAGALL


A patient, who sustained an acute coronary thrombosis, collapsed and developed asystole. Simple measures of resuscitation were used unsuccessfully for 3 minutes. On the ward bed, after a proper intercostal incision was made and oxygenation provided, the asystolic heart responded following 10 minutes of cardiac massage. It began to fibrillate, and this mechanism was then converted to sinus rhythm by the use of intravenous 2 per cent procaine. The patient made an uneventful recovery without evidence of cerebral damage and was alive 9 months later. It was concluded that if cardiac arrest, as a complication of coronary occlusion, was due to disturbances of conductivity or "electrical instability" then all the heart needed was another opportunity to beat. This chance can possibly be provided by cardiac massage and a drug to reduce the irritability of the myocardium.

KRAUSE

Circulation, Volume XXIII, January 1961
ELECTROCARDIOGRAPHY, VECTORCARDIOGRAPHY, BALLISTOCARDIOGRAPHY, AND OTHER GRAPHIC TECHNICS


Various types of premature beats were reproduced experimentally in dogs. Distinction of supraventricular from ventricular beats depended on the location of the extrasystolic QRS in the cardiac cycle as well as on its morphology. Decreased QRS duration and aberrancy were observed in ventricular extrasystoles appearing later in the P-R interval, in contrast with those seen in the T-P interval, which nearly always had a QRS duration of greater than 0.12 second and a pattern of complete bundle-branch block. The summation of a supraventricular stimulus and a ventricular extrasystole was found capable of producing a morphologically normal QRS with duration under 0.10 second. Supraventricular premature beats arising late in the cardiac cycle produced QRS complexes morphologically the same as those of sinus origin. However, those developing early in diastole generated QRS complexes of first- or second-degree bundle-branch-block type (right or left). The authors believed that previously held diagnostic concepts of the site of origin of premature beats should be revised in view of these findings.


The operative electrocardiogram often was of little value in this study, since the surgeon could readily detect arrhythmias. In a few cases, however, the electrocardiogram was the only manifestation of the sudden appearance of a serious difficulty, such as atrioventricular dissociation or bundle-branch block caused by a suture. This was observed twice in the total series, but the catastrophe avoided justified the use of operative monitoring. These electrocardiographic signs are not necessarily specific for certain surgical maneuvers and may result from intraoperative excitation without any detectable anatomic lesion. Other findings, including a widening of the QRS complex, alterations in the S waves, lengthening of the P-Q or S-T intervals, and T-wave inversions could not be ascribed to a definite lesion.


Fourteen patients with Chagas myocarditis were selected for vectorcardiographic study because of electrocardiographic QRS complexes of 0.12 second or greater with a superiorly oriented AQRS. These patterns were commonly found with right bundle-branch block. Ten patients had vectorcardiograms showing complete right bundle-branch block; there was additional evidence of intraventricular conduction disturbance and loss of electrical forces (attributed to myocardial fibrosis) not revealed by electrocardiographic analysis. Vectorcardiograms of the remaining 4 patients presented signs of left ventricular hypertrophy but not of right bundle-branch block. In 2 of these patients the electrocardiographic diagnosis of left bundle-branch block was not confirmed, since the horizontal plane insertion of the QRS loop was counterclockwise and the delay was predominantly in the terminal forces.


The clinical value of intracardiac phonocardiography was studied in 180 patients. The phonocardiograms were obtained from a barium titanate microphone incorporated into the tip of a specially designed catheter. The normal intracardiac phonocardiographic patterns as well as those obtained in a variety of congenital and acquired cardiac
disorders are described. The clinical value of this technic in diagnosis arose from the fact that by this method murmurs could be sharply located to that chamber or vessel that received the blood responsible for their production. The greatest practical help was found in the cases of congenital heart disease. Thus, with an uncomplcated ventriculal septal defect a pansystolic murmur was recorded only within the right ventricle, and with patent ductus arteriosus a continuous murmur was recorded only within the pulmonary artery. These findings enabled a diagnosis of either of these conditions with certainty, even when oxygen studies and clinical signs were equivocal. The different patterns obtained on withdrawing the sound catheter from the pulmonary artery into the right ventricle enabled the differentiation of infundibular and valvular pulmonary stenosis. In atrial septal defect this technic confirmed the source of the murmurs and sounds as the increased flow across the tricuspid and pulmonary valves rather than in the flow across the defect. With Lutembacher's syndrome a mid-diastolic or presystolic murmur in the inflow tract of the left ventricle was a diagnostic sign. This method also proved to be of some help in the cases of acquired heart disease so studied establishing the tricuspid origin of the apical systolic murmur in pure mitral stenosis, in differentiating between a mitral opening snap and a delayed pulmonary closure, and in defining right-sided gallop rhythm.


Of 3,078 routine electrocardiograms, 828 showed a duration of the P wave exceeding 0.12 second (0.11 second at heart rates over 100, 0.13 at those less than 60). The incidence of this widening increased continuously from the second to the fifth decade, in a curve which was parallel to that of the incidence of arteriosclerosis but showed a lag of about 1 decade. Both curves showed a decreased incidence in women. In the patients with widening of the P wave definite clinical signs of arteriosclerosis increased from 10 per cent in the fourth to 50 per cent in the seventh decade. In many patients widening of the P wave preceded the appearance of myocardial infarction or atrial fibrillation. In patients under 40 years of age widening of the P wave was seen in 93 of 1,112 cases. Of these, 17 had valvular disease; 10, hypertension; 11, infections; and 55, no apparent cause: of the latter, 22 had also an intraventricular conduction disturbance.


Electrocardiographic alterations were estimated to be present in 85 per cent of patients with pulmonary emphysema. Early in the course of the disease the electrocardiogram is within normal limits although the QRS and P axes tend to approach +90 degrees. As the emphysema progresses, the standard and precordial leads acquire S waves, and the P waves grow taller and more peaked. Right axis deviation of QRS proceeds to an indeterminate axis when the mean QRS vector appears to be directed backward and perpendicular to the frontal plane. The curious electrical axis alterations in advanced emphysema could not be explained on the basis of anatomic change in heart position and were attributed to altered extra cardiac conduction caused by the insulating effect of emphysematous lung anterior to the heart. The clockwise axis rotation produced, in 2 to 3 per cent of patients, QS complexes in leads V2-3 that could be confused with those of myocardial infarction. The classical electrocardiographic pattern of right ventricular hypertrophy was found in 5 to 8 per cent of emphysematous individuals while right ventricular enlargement was present anatomically more commonly. Twelve illustrative case summaries with chest roentgenograms were presented.


Vectorcardiograms and electrocardiograms were obtained on 100 patients who had uncomplcated left ventricular hypertrophy and no clinical evidence of coronary artery heart disease. Qualitative and quantitative descriptions of the QRS and T loops and the RS-T junction are presented. Analysis of the results showed that a screening diagnosis of left ventricular hypertrophy could be made on the basis of QRS morphology. S-T segment displacement, T-wave configuration and orientation, QRS-T angle, and certain features of
ABSTRACTS

the initial forces and terminal appendage. The data further showed that a definitive diagnosis of left ventricular hypertrophy could be made on the basis of 11 QRS measurements that proved to be frequently abnormal in left ventricular hypertrophy and only rarely abnormal in other conditions. In 91 per cent of the 100 cases, a diagnosis of left ventricular hypertrophy could be made employing only 3 of these 11 diagnostic measurements. It was concluded that in the diagnosis of left ventricular hypertrophy the vectorcardiogram is superior to the electrocardiogram.

SAGALL


The blood pressure of newborn infants was measured by means of an automatic recording device that utilized a crystal microphone in place of the stethoscope; the microphone was placed on the inner surface of a nondistensible blood pressure cuff. The mean systolic blood pressure was 71 mm. Hg (range 58 to 95) and the mean diastolic blood pressure was 52 mm. Hg (range 42 to 64).

KARPMAN


Of 275 punctures of the left heart, 121 showed no serious immediate incidents, but could not be followed; of the 154 patients followed in detail, 88 had no reactions, 3 developed shock necessitating interruption of the procedure, 5 had pneumothorax, of which 1 precipitated cardiac failure leading to death after 10 days. Hemoptyysis appeared in 10 patients after left atrial puncture, especially after repeated attempts, fever of short duration occurred in 18, prolonged pain at the puncture site in 5, and subcutaneous emphysema in 1 patient. Multiple ventricular extrasystoles persisting up to 2 minutes appeared in 5, atrial fibrillation in 2, S-T depression in 2, and S-T elevation lasting 5 days after ventricular puncture in 1 patient. Hemopericardium appeared in 3 patients. In 1 of these, who was anticoagulated before the procedure, it led to death on the 5th day; this patient demonstrated that excessively low prothrombin concentrations should be avoided. In another patient the hemopericardium led to grave heart failure, which disappeared after paracentesis, and to subclavian venous phlebitis, after direct aortic puncture. It is concluded that puncture should be avoided in patients with grave cardiac failure, even if this has improved after treatment, and in those with thromboembolic disease. Mild anticoagulation makes puncture easier but marked hypoprothrombinemia should be avoided. The duration of catheterization plays no important role, but repeated attempts facilitate accidents. In general, transthoracic puncture of the left ventricle is better tolerated than posterior left atrial puncture or retrosternal aortic puncture.

LEFESCHKIN


Biochemical and ballistocardiographic data are reported on 165 normal subjects and 115 patients with coronary heart disease clinically evident by angina pectoris or remote myocardial infarction. The mean serum cholesterol value was significantly higher in patients with coronary heart disease but there was an age trend that resembled that in the normal subjects, namely, a progressive rise from age 20 to a maximum in the seventh decade. Protein and lipoprotein electrophoretic patterns revealed an increased beta lipoprotein and an increased or retarded alpha-2 protein as the most significant changes. In normal individuals lipid protein abnormalities were more frequent as age increased, so that in the sixth to eighth decade they were present in about 50 per cent of the subjects. In patients with coronary disease lipid protein abnormalities were detected considerably more frequently than in the normal subjects, especially in the age range from 30 to 59 years. In all clinically normal persons under 40 the ballistocardiogram was normal. As the age of the normal subjects increased abnormal ballistocardiograms were found more often, with a maximum of 100 per cent being abnormal in the eighth decade. In patients with coronary disease there was a similar trend, but abnormal ballistocardiograms appeared more frequently than in normal persons. Except for the mutual relationship to age there was no association between serum cholesterol levels and ballistocardiographic classification in normal individuals. In the coronary disease group it was only in the 30- to 40-year-old age range that an increased mean serum cholesterol could be correlated with an abnormal ballistocardiogram. In normal subjects and in young patients (30 to 49 years) with coronary disease, lipoprotein and protein electrophoretic abnormalities occurred more frequently in association with abnormal ballistocardiograms
than in those with normal records. It is concluded that the result of this study indicates that further study between changes in serum lipid proteins and circulatory function may be rewarding.

SAGALL

SURGERY AND CARDIOVASCULAR DISEASE


A fatal case of brainstem ischemia is presented as a complication of cardiopulmonary bypass utilizing the left subclavian artery subsequent to ligation of the internal mammary and vertebral branches. Because of anomalous blood supply, the ligation of the left vertebral artery deprived the basilar artery of its major blood supply. A review of autopsy material in adults and children and a review of the literature indicated that the following anomalous communications exist. The right vertebral artery may have inadequate communication to the basilar artery in 3.1 per cent of specimens. Similarly, the left vertebral artery may have inadequate communication to the basilar artery in 1.8 per cent of specimens. In addition, there is a wide variation in the size of the 2 vertebral arteries. Therefore, the femoral route for arterial cannulation during bypass procedures is advocated to avoid the mortality associated with sacrifice of the vertebral artery. Appropriate precautions have been taken in the Blalock-Taussig procedure, in tetralogy of Fallot, operations for coarctation, and resections of aneurysms of the thoracic portion of the aorta.

Sheps

UNCOMMON FORMS OF HEART DISEASE


A very obese 47-year-old man without any other cardiac or pulmonary disease gradually developed sonolence, dyspnea, cyanosis, and signs of right ventricular failure. The vital capacity was reduced (65 per cent), the residual air increased (20 per cent), the arterial oxygen saturation reduced (87 per cent), and the carbon dioxide increased (66 mm.). Erythrocytes and the electrocardiogram showed marked right axis deviation, tall R waves in V1, deep S waves in V6, and inverted T wave in leads II, III, and V1-V6. After dietary and diuretic treatment, as well as thyroxin, had led to a 20 Kg. loss of weight, all findings became more normal and the electrocardiogram showed only slight right axis deviation with normal T waves. Another patient, a 52-year-old man, showed similar findings. The right ventricular hypertrophy in these patients was attributed to pulmonary vascular constriction due to hypoxia as a result of inadequate ventilation combined with increased blood viscosity due to hyperglobulinemia.

Lepeschkin


Both patients (a 56-year-old woman and a 45-year-old man) showed large, immobile hearts, diastolic gallop, venous hypertension, hepatic enlargement, ascites, and leg edema. Cardiac catheterization disclosed reduced cardiac output, elevated pulmonary capillary, pulmonary arterial, right ventricular, atrial, and ventricular filling pressures with a "diaplateau" configuration. The electrocardiogram showed progressive low voltage, QS complexes in the right precordial leads and inverted T waves in the limb and left precordial leads. All these signs are typical of constrictive pericarditis, which was the original diagnosis. The similarity is explained by the anatomic findings, which included destruction of myocardial fibers directly as a result of amyloid infiltration, indirectly as a result of stenosis or occlusion of peripheral arterioles by amyloid, and interference with normal contraction and distention of the remaining fibers, which were imbedded in the stiff amyloid tissue. The "angina of effort" shown by the patients could be due to coronary arteriolar stenosis; later it was accompanied by hepatalgia of effort. The amyloid nature of the cardiac involvement can be suspected in the presence of associated involvement of the tongue, skin or nodes, splenomegaly or hyperglobulinemia, but it can be proved only by means of biopsies of the muscles, liver, skin, or other organs. Treatment with anticoagulants or with cortisone or its derivatives seems to be contra indicated in amyloidosis.

Lepeschkin


A case of right atrial myxoma, not diagnosed during life, is reported. Previously, various authors have published clues to aid in the diagnosis of intracardiac tumors. These include alteration
in signs and symptoms with changes in posture, recurrent episodes of syncope, systemic embolization without bacteremia, variability of heart murmurs, and progressive failure with rapid cardiac enlargement. The authors note the syndrome of fever, anemia, and rapid sedimentation rate in their case and in previously reported cases. The systemic reaction is possibly due to degenerative changes in the tumor, a common manifestation of myxoma.

Krause


The clinical syndrome of puerperal cardiomyopathy may consist of congestive heart failure, cyanosis, tachycardia, triple rhythm, emboli from both sides of the heart, and chest pain. Electrocardiographic abnormalities and roentgen evidence of cardiac enlargement are often found. Though the actual incidence of exacerbations is undetermined, there is a tendency toward recurrence with subsequent pregnancies. Pathologically, the hearts are soft and flabby and contain ventricular mural thrombi. Histologically, the lesions are degenerative rather than inflammatory, and the myocardium shows foci of disintegrating myocardiad fibers. The disease is more common in twin pregnancies. The incidence of the disease is probably low and mortality may occur. No satisfactory cause for the degeneration has been discovered.

Krause


The authors report the complete clinical history, physical examination, and laboratory and necropsy findings in a 15-year-old schoolgirl with a myxoma of the left atrium. Death was produced by a cerebral tumor embolus and was not antedated by any cardiac symptoms. The initial symptoms were those secondary to Raynaud's phenomena but a modified cold sensitivity test was negative. The authors hypothesize that the Raynaud's phenomena may have been secondary to the vasospastic effects of small peripheral tumor emboli.

Karpman

VALVULAR HEART DISEASE


Two hundred patients subjected to mitral commissurotomy were examined clinically and by multiple laboratory technics for periods up to 3 years after surgery. Sixty-seven to 70 per cent improved sufficiently to return to normal life. Twenty-six patients developed mitral regurgitation; however, in 15 of these it was of slight degree and considerable subjective benefit followed surgery. Unsatistactory results were due to inadequate commissurotomy in 3 patients, to restenosis due to rheumatic reactivation in 2 patients, and to arterial emboli in 3. Twenty-five had a postpericardiectomy (postcommisurotomy) syndrome, which was unrelated to the appearance of the left atrial biopsy or to recurrent rheumatism. Objective findings usually paralleled subjective betterment. This parallelism particularly applied to substantial reduction of the diastolic mitral gradient and the pulmonary wedge and arterial pressures, especially when these were very high preoperatively. Subjective improvement could not generally be correlated with roentgenographic changes, pulmonary function tests, or findings of lung biopsy. In some patients the clinical improvement was greater than that reflected by the objective tests, which included vectocardiograms, ballistocardiograms, angiograms, phonocardiograms, and electrokymograms.

Rogers


In an effort to evaluate the accuracy of the indicator dilution technic in measuring mitral regurgitation, an operative shunt was created in dogs between the left ventricle and left atrium, which could be controlled and used for many comparisons between open and closed shunts. Fifteen dogs were so prepared and the degree of mitral insufficiency was regulated to about 20 to 38 per cent of cardiac output. If control values were obtained first, the technic was satisfactory for detection of small amounts of regurgitation. In the absence of control curves, it was not possible to distinguish open from closed shunts. Furthermore, even with a control tracing it was not possible to quantitate the shunt. The authors state that the difficulties in the method are due to variations in volume, mixing, and washout.

Kayden


Fifteen patients with relatively pure mitral insufficiency underwent open-heart surgery. In
2, there was some stenosis of the mitral valve, although insufficiency was the predominant lesion. Two patients were in class II, 9 in class III, and 4 in class IV of the New York Heart Association Classification of Cardiac Function. Hemodynamic data were obtained before and after surgery. Asystole was not induced as the beating heart was essential for the proper evaluation of the effectiveness of the operative procedure. At operation one third of the patients had ruptured chordae tendineae. The involved leaflet was markedly elongated and everted freely into the left atrium during systole. In the remaining patients, the posterior leaflet was usually retracted and deficient in tissue. A dilated mitral ring was found in 9 of the patients. The attack on the mitral valve was individualized. In the presence of a dilated ring, sutures were placed in the mitral anulus in the region of one or both commissures to narrow the mitral ring. Two methods were used in the correction of ruptured chordae tendineae. The flail leaflet was fixed to the left ventricular wall and mitral ring and thereby immobilized. It acted as a baffle against which the intact leaflet could close. Another method consisted of shortening the elongated portion of the leaflet and tightening its leading edge by insertion of plicating sutures. This increased the rigidity of the leaflet and prevented eversion during systole and contributed to valvular competence. In the absence of a dilated ring, when incompetence was caused by deficiency of tissue in the posterior leaflet, a roll of Ivalon was sutured under the leading edge of the posterior leaf. The anterior leaflet met the prosthesis during systole, and competence was achieved. Two patients failed to survive the operation, and a third died on the ninth postoperative day because of arrhythmia. Air embolism occurred early in the series in 2 patients. Two of the surviving patients did not have a murmur at the apex at the time of discharge, and the remainder had a soft apical murmur. Postoperatively there was a uniform decrease in pulmonary artery wedge and pulmonary artery pressures and in the pulmonary vascular resistance to normal or near normal values. The cardiac index increased from below normal to normal values. Indicator-dilution curves demonstrated improvement in the contour at the initial postoperative catheterization in all instances. Three patients have been operated on too recently for evaluation. One patient died suddenly in heart failure 2 months after operation. Another patient has had continuing severe congestive heart failure although considerably improved. The remaining 7 patients are clinically well 3 to 12 months postoperatively and have been classified functionally in class I. In 2 of 3 patients studied hemodynamically after several months there was evidence of some recurrence of mitral insufficiency. The long-term effectiveness of this operative procedure cannot yet be evaluated. At present the authors advise open-heart repair for patients with relatively pure mitral insufficiency when significant progressive functional disability is present.

Sheps


It is commonly accepted that cardiac pulmonary hemosiderosis will result in fibrosis. Probably the deposition of hemosiderin results from pulmonary capillary hypertension, leading to repeated intra-alveolar hemorrhages or diapedesis of red cells, possibly from varicosities in the anastomoses between bronchial vessels and pulmonary arterioles. Two patients with mitral stenosis are presented in whom pulmonary hemosiderosis did not progress to fibrosis. In 1 patient the miliary chest pattern was present for 18 years but after successful mitral commissurotomy it disappeared. In the second patient with typical roentgen evidence of pulmonary hemosiderosis and a 30-year history of hemoptysis, a successful mitral valvotomy could not be performed because of a heavily calcified valve. The patient died from a cerebral embolus, and the lungs at autopsy showed heavy hemosiderosis but no evidence of fibrosis, macroscopically or microscopically. It is concluded the mitral-induced pulmonary hemosiderosis, seen by x-ray, is not a contraindication to mitral valvotomy. Indeed, successful valvotomy might result in gradual disappearance of the miliary infiltration in the lung.

Krause


The dye-dilution method has been reassessed in relation to the quantitative estimation of valve incompetence. The paper shows that under clearly definable conditions in a circulation model, the dye-dilution method yields accurate quantitative estimates of the amount of regurgitant flow. When dye was injected close to the zone of incompetence in either aortic or mitral incompetence, good agreement between estimated and actual backflows was obtained. With a rigid atrium, the effect of valve incompetence on the dye curve was to cause a difference between the estimated and the observed volume between the injection and sampling sites. Estimated backflow was consistently below actual backflow. Intraventricular
injection of dye in the presence of mitral incompetence also caused error in the estimation of volume and backflow. When dye was injected far from the site of incompetence, underestimations of considerable magnitude were observed with both aortic and mitral incompetence. When both valves of 1 ventricle were incompetent, the method did not give correct estimates of the total amount of valvular incompetence.

KURLAND


The purpose of this paper was to describe certain relationships of the annulus-valve complex in the competent and incompetent valve and to describe posteromedial annuloplasty, an operative procedure found to be of value in the correction of mitral regurgitation. Physical signs of mitral regurgitation may be present long before serious disability appears. Once this occurs the course rapidly deteriorates. Superior dislocation of the mitral annulus and enlargement of the left ventricle increase the degree of mitral regurgitation. This results in increased length of distance between the attachment of the leaflets to the annulus and the attachment of the chordae tendineae to the ventricular wall. The operative procedure employed by the authors was to shorten this distance and thus decrease the degree of regurgitation. With the patient on a bypass and the left atrium emptied of blood, a decrease in regurgitation was effected by a posteromedial annuloplasty. Coronary arteries and veins were carefully avoided and the remaining mitral orifice was tested for 2-finger patency to avoid producing stenosis. In patients with pure mitral insufficiency the results were encouraging. When there was combined stenosis and insufficiency the results were less satisfactory because of calcification and marked deformity of the valves. The poorest results have been obtained in lesions associated with some degree of aortic insufficiency. However, it is felt that, when the latter is of minor degree, mitral annulus valvuloplasty should be attempted. Air embolism is always a problem and precautions to avoid this are mentioned. Clots have been encountered only in patients with stenosis. Thrombi have not been seen in patients with insufficiency. The chief indication for the operation is serious disability (class III or IV functional capacity) due to mitral regurgitation or combined stenosis and regurgitation of rheumatic etiology in an apparently inactive state. In the class III patient the risk of open mitral valve surgery, while high, is approaching the risk of blind commissurotomy. This procedure, however, is not indicated at this time in patients with pure mitral stenosis.

LEVINSON


It was possible to produce uniformly high degrees of aortic insufficiency in dogs by transventricular aortic valvulotomy with the Himmelstein valvulotome. Pressure and flow studies were carried out before and after aortic valvulotomy and then repeated after placement of the Hufnagel prosthetic ball-valve in the descending aorta just distal to the left subelavian artery. Pulse pressures were increased from 35 mm. Hg before to 150 mm. Hg after aortic valvulotomy. The mean flow in peripheral arteries was reduced by more than 50 per cent. Cardiac output was also reduced. It might be anticipated that in a chronic state the ventricular ejection might be increased to maintain peripheral flow. Placement of the prosthetic valve resulted in decreased regurgitation from the descending aorta but increased reflux from the cerebral and brachial vessels. There was only slight decrease of reflux in 7 experiments. The mean flow in the descending aorta was increased but there was evidence of further diminution in flow to the cerebral vessels and probably to the coronary arteries. It would appear that successful surgical correction of aortic insufficiency awaits a suitable prosthetic valve.

LEVINSON


A 27-year-old woman with increasing dyspnea of effort showed enlargement of the left ventricle, a diamond-shaped systolic murmur in the third and fourth left interspaces, a normal second sound, and a left ventricular hypertrophy and “strain” pattern with incomplete left bundle-branch block in the electrocardiogram. Catheterization of the right ventricle disclosed normal values, whereas that of the left ventricle showed a systolic pressure gradient of 80 mm. between left ventricle and aorta. During operation for aortic valvulotomy no stenosis could be found, and the patient died 5 hours after the operation. At autopsy marked hypertrophy and fibrosis of the left ventricle, with predominantly subendocardial and septal localization, were found; this caused diffuse stenosis of the entire outflow tract of the left ventricle. In contrast to typical valvular or subvalvular aortic stenosis, the ascent of
the aortic pressure curve was not delayed but synchronous with that of the left ventricular curve; however, it showed a secondary fall soon after its summit corresponding to creation of a stenosis by the contracting ventricular wall. Other points of differentiation were the absence of poststenotic aortic dilatation and the low localization of the murmur. A second patient, a 27-year-old woman, who showed almost exactly the same findings of functional or transient aortic stenosis, was not subjected to surgery.

LEPESCHKIN


Of 92 out-patients 48 to 75 years of age, who showed physiologic arteriosclerosis, 34 had a systolic murmur in the aortic region, confined to the first half of systole, containing frequency components exceeding 70 c.p.s. and usually transmitted to the carotid region. Compared to the persons without murmurs, these persons had a higher incidence of aortic dilatation and elongation, higher systolic blood pressure and especially pulse pressure, and a much higher stroke volume and lower peripheral resistance, determined according to Broemser and Ranke. It is concluded that the murmurs are caused by an increased velocity of systolic ejection, combined with a sudden increase in cross-sectional diameter caused by dilatation of the aorta; both these factors facilitate eddy formation. Roughness of the aortic wall or valves secondary to atheromatosis is not a major factor, as murmurs may be absent when these changes are very pronounced. Increase of heart output by means of exercise or injection of Effortil and Suprarenine may cause systolic murmurs to appear in persons who ordinarily do not show them.

LEPESCHKIN


The clinical and hemodynamic features of 141 surgically proved cases of combined mitral and aortic stenosis are reviewed. The group was composed of 52 men and 89 women and their ages ranged from 23 to 67 years. The findings in this group were compared to those in a series of 2,000 patients with pure mitral stenosis and to a series of 350 patients with pure aortic stenosis. Dyspnea and fatigue were present in 90 per cent of the patients with the combined lesions and two thirds of the group had edema. These observations were not different from those in patients with isolated aortic or mitral stenosis. The incidence of the anginal syndrome and of syncope in the group with combined lesions was one half the incidence in a group with isolated aortic stenosis. The rough murmur of aortic stenosis was present in all cases, and four fifths of the group had an abnormal aortic second sound. The murmur of mitral stenosis was also heard in almost every patient. Four fifths of the group had cardiomegaly by chest roentgenogram. The configuration resembled that seen in mitral stenosis rather than in isolated aortic stenosis. Electrocardiograms revealed a pattern of right, left, or combined hypertrophy in 40 per cent of the subjects. Cardiac catheterization was carried out in 31 patients. The calculation of valve areas showed no difference in the combined or isolated valve lesion. The cardiac output was less in the group with combined lesions compared with the group with an isolated lesion, but marked elevation of mean pulmonary artery pressure was not observed in the group with combined lesions.

Kayden

VASCULAR DISEASE


Microangiographic studies of the rabbit ear were carried out before and as long as 7 months after ligation of the central artery and, in some instances, of 1 of its branches. Circulation was regularly maintained by means of enlargement of previously demonstrable collateral arteries. The enlargement was detectable 1 week after ligation and reached a maximum 2 to 3 weeks later when some of the collateral vessels also had become tortuous. The collateralization appeared to be due to hydrodynamic rather than ischemic forces, and mock ligations were followed by no change in the major arterial pattern. These findings contrast with those following occlusion of a porcine coronary “end” artery, where significant collateral vessels have been demonstrated 48 hours later, or following occlusion of an artery in a hamster cheek pouch in which collateral vessels may develop in sites where vessels have not previously been seen.

Rogers

ABSTRACTS

The clinical picture of left colon infarction consists of severe left lower abdominal pain and tenderness, usually accompanied by a bloody rectal discharge. In 3 patients in whom this picture was present, sigmoidoscopic examination revealed ischemic mucosal changes. These changes consisted of blue-black areas and represented early hemorrhagic infarction. These changes were seen in the rectosigmoid or higher, depending upon the condition of the blood supply. S. Sheps


Eight patients with peripheral arteriovenous fistulas (5 traumatic and 3 congenital) are reviewed. The traumatic fistulas were seen in men whose ages ranged between 20 and 38, while the congenital fistulas occurred in women whose ages ranged between 16 and 23. The fistulas were located predominantly at the site of middle-sized vessels (subelavian; 2; femoral; 2; brachial; 1), and had been present an average of 4 years. At the precordial area the following features were present: accentuated sounds in 1 patient; a soft systolic apical murmur in 2 patients at the apex and a systolic and diastolic murmur, transmitted from the site of the fistula, in 3 patients. Electrocardiographically 3 patients showed “diastolic overloading” of the left ventricle, and 1 a suggestion of left ventricular hypertrophy. Radiologically 4 patients showed moderate cardiac enlargement. Clinically, 1 patient had left-sided heart failure; 1 complained of precordial chest oppression and palpitation with effort; 1 complained of short stabbing precordial pains, and 1 had vague complaints over the affected area. The diastolic pressure in the right ventricle was elevated but never above 10 mm. Hg. A slight gradient between the systolic pressure of the right ventricle and the pulmonary artery was noted. The cardiac index was elevated. The pulmonary pressure was decreased in 2 patients when the fistula was compressed. There was an evident decrease in flow through the fistula when the area was compressed, as proved by the fact that the venous blood distal to the fistula became less saturated following this compression. S. Sheps


The serum level of glutamic oxalacetic transaminase was found to be normal in 16 patients having chronic peripheral arterial insufficiency and in 16 of 19 patients who additionally had gangrene. The remaining 3 patients had elevated levels attributable to coincidental acute myocardial infarction or liver damage. In acute peripheral arterial occlusion, 7 of 9 patients had elevated transaminase levels 10 to 40 hours after symptomatic onset. Femoral artery ligation or embolization in dogs was regularly followed within 10 hours by rises in transaminase values to a peak of 340 units per ml. at 48 hours, and these returned to normal at about 130 hours. S. Rogers


Five cases, 2 due to embolism and 3 to thrombosis, of the anterior tibial syndrome are described. The main clinical features were ischemic necrosis of the anterior tibialis muscle and, in greater or lesser degree, the extensor hallucis longus and extensor digitorum longus muscles. The immediate cause was occlusion of the anterior tibial artery or its parent trunk. This may be due to swelling of the muscles following unaccustomed exertion and resultant rise in intracompartmental pressure above the arterial blood pressure; local expanding lesions within the compartment, with similar effect; and embolism or thrombosis of the anterior tibial artery. For the postexertional cases a prompt incision to divide the deep fascia over the muscles is suggested to decompress the compartment. In cases due to


Experience with 28 patients with ruptured abdominal aortic aneurysms is reviewed. Four patients were considered inoperable. Three patients died during the course of operation. Twenty-one had aneurysms resected and replaced by a graft. There were 9 survivors beyond the 1 month postoperative period. When the diagnosis was difficult as in some obese patients, roentgenograms of the abdomen, and in particular a lateral view, often outlined the aneurysm. Operative technic and management is described in detail. The early complications included impaired circulation to the legs, renal shut-down, and other vascular complications. Wound infections were frequent. Two patients died of ulceration of the proximal anastomosis into the duodenum, with fatal hemorrhage, 6 months and 33 months postoperatively. The cases are reviewed in detail. S. Sheps

Rogers

Circulation, Volume XXIII, January 1961
arterial thrombosis or embolism the use of vasodilating drugs and anticoagulation is indicated.

**Krause**


The experience gained in 10 cases of late arterial embolectomy (carried out from 13 hours to 20 days after occlusion) is discussed. The results were good in 5. In 4, a degree of gangrene developed requiring amputation and 1 patient died with threatened gangrene. Preexisting vascular disease predisposed to recurrence of thrombosis at the site of the arteriotomy and also often precluded retrograde flushing. Pretreatment with anticoagulants in 6 patients seemed to account for the minimal or moderate secondary thrombosis encountered in those cases during embolectomy. In addition, anticoagulants seemed to prevent emboli and thrombi from adhering to the intima. A review of the literature is also presented.

**SHEPS**


The most common symptom of arterial insufficiency is intermittent claudication, which is characterized by distress induced by exercise, usually walking, and is relieved within minutes by stopping and standing. It is important that a good history of the degree of limitation be obtained, and if there is any doubt, a standardized walking test should be performed. The physical examination in aorto-iliac occlusive arterial disease will usually reveal diminished or absent pulsations in the lower part of the abdominal aorta and below the bifurcation of the aorta. Coldness of the feet and legs, and pallor of the extremities on elevation are variable findings, depending upon the degree of collateral circulation. Aortography usually will visualize the site and degree of obstruction, and may reveal other sites of obstruction in the upper part of the femoral arteries and iliac arteries, if these are present. Aortography should be done only if the patient's symptoms are of sufficient severity to warrant surgical treatment and if the patient's age and general health will permit surgical treatment. Contraindications to angiography include bleeding disorders, anticoagulant therapy, and sensitivity to radiopaque substances. Since ischemic neuropathy, ischemic ulcers, or gangrene is uncommon in uncomplicated aorto-iliac occlusion, the author believes that surgical intervention must be individualized for each patient on the basis of symptoms of ischemia, and not routinely done in patients with evidence of occlusion of aorto-iliac arteries.

**Kayden**


Experience in the management of 60 patients having 72 emboli is described. Forty-eight patients having 57 emboli were treated surgically and 7 patients having 9 emboli were treated by anticoagulant agents alone. Five patients were observed to whom no specific treatment was given. In 57 of the 60 patients, the heart was the site of origin of the embolus. Most of these patients had arteriosclerosis, a few had rheumatic fever, recent myocardial infarction and 1 had severe cardiac decompensation. Atrial fibrillation was present in 90 per cent of the patients. One patient had an abdominal aortic aneurysm and another a plastic valve in the proximal aorta, as the source for the embolus. In 1 patient no source was apparent. The technic of embolectomy is discussed, emphasizing the use of multiple arteriotomies and reversed flushing technics. The operative and postoperative use of anticoagulants is also emphasized. Heparin was used preoperatively to forestall propagation of a thrombus when a significant time lag between diagnosis and operation was unavoidable. The authors recommend permanent anticoagulant therapy after removal of an arterial embolus.

**SHEPS**


In 20 patients with Raynaud’s disease, digital arterial pressure was measured with a Gaertner capsule and digital blood flow was measured calorimetrically under standardized conditions, after heat-induced vasodilatation and after l-norepinephrine-induced vasocostriction. Eleven patients were found to have evidence of heightened vasomotor tone and no arterial obstruction; the remaining 9 displayed normal vasomotor tone and arterial obstruction. Only 1 patient showed increased sensitivity to norepinephrine. It was thought that Raynaud’s attacks are produced either by arterial obstruction plus a normal degree of vasoconstriction tone or by heightened vasomotor tone alone, probably resulting from increased sympathetic neural discharge.

**Rogers**


Occlusion of the cranial vena cava can be caused by malignant tumors, aortic aneurysms, mediastinal hemorrhage or emphysema, thrombo-phlebitis or thrombosis; the latter is rare. Gradual development of the obstruction allows adequate
formation of collateral vessels in the vicinity of the vertebral column and in the subcutaneous tissue of the chest wall. Three cases are presented in which the obstruction took place gradually and led to formation of subcutaneous varicosities without subjective symptoms. In 2 of these cases the obstruction could be shown by means of angiography, while in the third case a calcified thrombus could be seen during fluoroscopy and demonstrated at autopsy.

LEPESCHKIN


Experience in management of 53 patients with thoracic outlet compression symptoms treated by anterior scalenotomy is described. A few patients had adjunctive procedures such as excision of cervical rib, division of fibrous bands on ligaments and cervicodorsal sympathectomy. Of 42 patients who had evidence of nerve or artery compression, 80 per cent received relief of symptoms. Of 7 patients who had evidence of subclavian vein compression, 6 received relief of symptoms. The average duration of symptoms for the entire group was 27 months, but the average for 8 patients who had a persistence of symptoms was only 4 months. It was emphasized that careful preoperative evaluation and repeated examination are necessary to eliminate the more "undesirable candidates" for operation. Only in patients with objective signs are the operative results likely to be satisfactory. These signs include sensory loss, a supraclavicular mass, muscle atrophy, scalene tenderness, a cervical rib, the presence of Adson's sign, arterial insufficiency, and venous obstruction. A cervical rib was present in only 12 (22 per cent) patients. This condition must be differentiated from a ruptured nucleus pulposus of the cervical spine, cervical osteoarthritis, and the superior sulcus syndrome.

SHEPS


Of 135 patients having surgical exploration for abdominal aortic aneurysms during 1953 to 1957, 10 were found unsuitable for resection because of renal artery involvement and 15 had resection with replacement by a synthetic graft. The remaining 110 replacements were preserved homografts, 6 of which were inserted under emergency conditions. Eighteen patients died in the postoperative period, 8 from rupture of the graft or its suture lines; and 8 died 1 1/2 to 2 1/2 years later, 3 from graft failure. Because of homograft failure in these 11 patients, the authors currently use a cloth prosthesis. Eighty-one of the remaining patients have been traced over periods up to 4 years postoperatively, and their survival rates have been nearly the same as that of the normal population of the same age (63 years).

ROGERS


The experience with surgery in 12 patients with carotid artery occlusion is summarized. Thromboendarterectomy was done in most patients. When the internal carotid artery is unusually small or extensively atherosclerotic, the authors suggest the prophylactic use of anticoagulants after surgery. Most favorable cases are those with intermittent symptoms with no paralysis at the time of surgery. It is doubtful that the patient with a paralysis of more than a few hours duration can be helped surgically.

SHEPS


In obtaining objective "normal values" in peripheral arterial circulatory disorders several methods are currently used. Arteriograms have been most universally accepted but have the disadvantage of being surgical procedures. Evaluation with the oscillometer is gaining increasing recognition and the best known instrument for this method of testing is the Pachon type of mechanical oscillometer. Measurements were made in 12 healthy men and were used to calculate oscillometric indices at 6 levels from the instep of the foot to the upper part of the thigh. The interpretation of data was thus systematized so that an increasing number of patients (330 in 1958) could be evaluated for the medical and surgical services. The results of these oscillometric tests not only helped to determine the type of operation needed but also to serve as criteria for subsequent improvement in the patient. Two clinically useful norms were established by the use of a standardized oscillometer. The first norm is called the gangrene point and is expressed by an oscillometric index of zero at the instep, zero above the ankle, and 0.125 below the knee. The second norm can be called the walking norm or lower limit of normal and is represented by readings of 0.5 at the instep, 2.5 above the ankle, 4 below the knee, 3.5 above the knee, 2.5 in the middle of the thigh, and 2.5 in the upper part of the thigh. These norms have been used in 904 patients over a period of 4 years.
and have been found to be reliable and useful. They provide an easy, practical method of objective evaluation and a permanent record for the physician.

KITCHELL


Of 7,382 carotid angiograms, carotid-basilar anastomoses were observed in 9 patients; in 6 persons a persistent primitive trigeminal artery was present, in 1 person a primitive acoustic artery, and in 2 individuals a primitive hypoglossal artery. This anastomosis can be easily recognized if during carotid angiography the posterior ramus communicans is not visualized but filling of the basilar artery takes place through a different, typically situated vessel. If the ramus communicans is also filled, the diagnosis is more difficult. The anastomoses usually do not cause any clinical symptoms.

LEFESCHIN

OTHER SUBJECTS


A long-term surveillance of a closed population group in Framingham, Massachusetts, is discussed with relation to problems in the choice of populations for study and questions about the inferences that may be drawn from a survey approach. The progression of atherosclerotic and hypertensive heart disease in normal persons and in individuals with known disease has been followed. Some important characteristics studied in the epidemiology of coronary heart disease, such as relative weight, cholesterol, and blood pressure, are not altered permanently by the disease event. Relative weight, blood pressure, and cholesterol levels for men who develop new coronary heart disease are the same for those who die from the disease as for those who do not, but those women who died weighed less and had higher cholesterol levels than those who survived. There were biases reported in initial responses to the study and biases in follow-up by clinical and other means. The response rate differed by age and sex and according to the section of the town. It also differed according to certain clinical characteristics. This is inferred from a persistently higher mortality in the non-responder group than in the respondent, and from differences between respondents re-examined regularly and those lost to follow-up. These biases are of moment in inferring from relationships shown by a description of the population but are considered trivial for prospective evaluation of hypotheses.

MAXWELL

REVIEWS IN CARDIOVASCULAR DISEASE


ABSTRACTS

Circulation. 1961;23:141-158
doi: 10.1161/01.CIR.23.1.141

Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 1961 American Heart Association, Inc. All rights reserved.
Print ISSN: 0009-7322. Online ISSN: 1524-4539

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://circ.ahajournals.org/content/23/1/141.citation

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

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

Subscriptions: Information about subscribing to Circulation is online at:
http://circ.ahajournals.org//subscriptions/