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BLOOD COAGULATION

Amphetamine in doses of 5 mg. or more, administered by stomach and also by parenteral injection in rabbits and dogs, accelerates clotting time of whole blood as studied by the Lee and White method. Similar results were obtained in a series of human subjects to whom the drug was administered by mouth. Methylamphetamine and dextroamphetamine act similarly but to a lesser degree than amphetamine itself.

BERNSTEIN


The effect of certain substances with vitamin K activity in modifying the action of dicoumarol and Tromexan has been investigated in the human subject. The vitamin K preparations employed were vitamin K1, Menaphthone, Acetomenaphthone, Kapilon, Synkavit, and water-soluble K analogue (Boots).

Apart from vitamin K1, these substances have been shown to possess a minor and inconstant ability to modify the action of these anticoagulants. Vitamin K1, on the other hand, is a reliable and efficient antidote, and is capable of completely blocking the action of therapeutic doses of dicoumarol and Tromexan, and capable of restoring to safe levels within a few hours excessive hypoprothrombinaemia due to these drugs.

Since these differences between the vitamin K preparations are not merely a question of dosage, of all the substances tested here only vitamin K1 can be regarded as a reliable antidote for a hypoprothrombinaemic emergency.

BERNSTEIN

CONGENITAL ANOMALIES

The author calls attention to the fact that absence or diminution of the abdominal aortic pulse is a characteristic feature of coarctation of the aorta. This sign is readily ascertained through careful inspection and palpation of the aorta. It is especially important in differentiating coarctation of the aorta from thrombosis of the bifurcation of this vessel. In the latter condition there are forceful pulsations in the proximal portion of the abdominal aorta.

ABRAMSON


The authors describe three electrocardiographic types associated with right ventricular hypertrophy due to congenital heart disease. The first termed "adaptation type" shows moderate or no axis shift in the limb leads; inversion of the T wave may be present in lead III; there is an upright QRS with or without T inversion to be found over the right precordium, but usually extending not farther than
to lead $V_1$. This pattern develops early in childhood and remains unaltered for years. It is found in cases in which the aorta originates partly or completely from the right ventricle.

The second pattern, called the "resistance type," shows marked right axis shift and inversion of the $T$ wave in both leads II and III, and upright $QRS$ complexes, depressed $S-T$ segments and inverted $T$ waves are seen over the whole precordium, sometimes extending up to $V_6$. Such an electrocardiogram is found frequently in pure pulmonary stenosis, or in association of the latter with an interatrial septal defect.

The third type of electrocardiogram, consisting of right bundle branch block, is termed by the authors the "strain type" and is found most frequently in cases with an atrial septal defect. The appearance of three different patterns of right ventricular hypertrophy in congenital heart disease can be explained on the basis of the different dynamics associated with the various lesions.

**PICK**


The ballistocardiograms of 22 patients were studied. Ten cases presented mitral stenosis; one, mitral stenosis and insufficiency; two, mitral stenosis and aortic regurgitation; two, aortic insufficiency; one, subaortic stenosis and aortic regurgitation; four, coarctation of the aorta; one, patent ductus arteriosus; and one, Lutembacher's syndrome.

The tracings obtained from the patients presenting mitral stenosis showed a diphasic $H$ wave, and often a high $L$ and a deep $M$ wave in 12 instances. Of the five patients in which aortic regurgitation was present, three had high ballistocardiographic waves, while the other two (those having combined mitral and aortic lesions) had a normal amplitude of the waves. In the four cases presenting coarctation of the aorta, a deep $I$ and a shortened $K$ wave were noted. Nonspecific modifications were noted in the case presenting Lutembacher's syndrome and in that with patent ductus arteriosus.

**Luisada**


The authors studied 15 cases of interauricular septal defects, either pure or associated with congenital or acquired lesions. All of these cases were proved by autopsy or hemodynamic studies.

Simultaneous filling of all cardiac chambers or of both auricles, and refilling of the right auricle at the time of filling of the left, are considered diagnostic data upon angiocardiography. These data were present in 93.4 per cent of the cases.

**Luisada**


Cardiac catheterization proved the association of two congenital abnormalities in a 4 year old boy having a loud systolic murmur. One of them was coarctation of the aorta; the other was an overriding aorta without pulmonary stenosis (Eisenmenger complex). This resulted in severe pulmonary hypertension which was increased by the aortic obstruction.

The arterial pressure was $160/109$ (76/66 in the poststenotic section of the aorta); the pulmonary arterial pressure was $160/107$.

Lowering of left ventricular pressure following aortic surgery was expected also to decrease right ventricular pressure.

**Luisada**


In 54 cases with various types of congenital heart disease, all diagnosed with the help of cardiac catheterization and/or angiocardiography, and some of them verified by autopsy, vectorcardiograms were recorded in three planes. Although there was a great variability of the loop patterns, some changes appeared to be characteristic for certain groups of anomalies or for specific lesions. Thus, it was found that in the majority of Fallot's tetralogy with marked right ventricular hypertrophy, the frontal vector loop developed in a clockwise direction; while in cases with left ventricular hypertrophy, like intraventricular septal defects, tricuspid atresia and coarctation of the aorta, the frontal loop took a counterclockwise course (from right to left). However, while in septal defects and coarctation, horizontal and frontal loops had the same direction of development, in tricuspid atresia the loop viewed in the horizontal plane developed from left to right. In one case of common ventricle with other associated anomalies, the vector loop had an unusual contour in all three planes, which suggested an anomalous course of the conduction system. In general, however, spatial vectorcardiograms as found in congenital heart disease can be explained without the assumption of anomalies of intraventricular conduction.

**Pick**

Coelho, E., Da Fonseca, M., Pinto, R., and Nunes, A.: Pulmonary Stenosis with Interatrial Septal

Two cases of pulmonic stenosis with auricular septal defect are described. The diagnosis was made by clinical and roentgenological data, as well as by angiocardiography and catheterization, and was confirmed by postmortem findings. The differential diagnosis of the Eisenmenger complex and the tetralogy of Fallot is discussed. This is considered important because pulmonic stenosis plus interatrial septal defect does not profit by the Blalock-Taussig operation, while it does from the Brocken operation (pulmonary valvulotomy).

The most significant data are prominent pulmonary arch with decreased pulmonary circulation; simultaneous filling of the two atria, the left ventricle, and the aorta two to three seconds after the injection; hypertrophy of the right ventricle; and penetration of the catheter into the left atrium.

Luisada


The authors collected from the literature 34 reports on levocardia in situ inversus and added five of their own observations, two of which were verified by autopsy. Association with other congenital malformations of the heart is very common. Most frequently there is a transposition of the atricles and/or dextroposition of the aorta; in a great number of cases, atresia or hypoplasia of the pulmonary artery was found, or anomalies of the venous return to the heart. A patent ductus arteriosus was present in about half of the reported cases. These associated anomalies produce a variety of clinical symptoms, of which cyanosis, encountered in 95 per cent of the cases, seems to be the most important. The electrocardiogram is of particular interest, since in some verified cases with transposed atricles, the P wave was upright in lead I; thus the most important electrocardiographic criterion of dextrocardia was absent. A search for situs inversus (palpation of the liver and radiologic determination of the gas bubble of the stomach) should be part of the examination in every case of congenital malformation of the heart.

Pick


The indications, value, and interpretation of angiocardiography in the diagnosis of congenital heart diseases are succinctly described. Since at least 26 deaths are known to have followed angiocardiography, and the hazard of the procedure is highest in young patients with congenital heart disease, care should be exercised in the selection of cases for examination.

The authors use frontal and lateral projections routinely in the study of cyanotic congenital cardiac patients. Their cumulative experience totals about 2000 consecutive angiocardiographic examinations without a fatality. Angiocardiography, although frequently employed, is rarely necessary or indicated in the study of a variety of noncyanotic congenital cardiac lesions, such as patent ductus arteriosus and isolated septal defects. It is essential in a few noncyanotic congenital heart conditions, such as coarctation of the aorta where it provides precise anatomic information concerning the lesion.

The authors strongly recommend that all patients with cyanotic congenital heart disease be studied by angiocardiography if surgery is planned. A knowledge of normal anatomy and physiology coupled with respect for an understanding of pertinent clinical and laboratory data will greatly facilitate the interpretation of angiocardiograms. Representative angiocardiograms are reproduced and discussed.

Harris


Impaired pulmonary diffusion of oxygen was demonstrated in 11 out of 62 patients with left-to-right shunts. In some cases diffusion was normal at rest, but was impaired during exercise. Impairment was demonstrated by showing abnormally great differences between arterial oxygen saturations while breathing air and while breathing 100 per cent oxygen. In those who also had a right-to-left shunt the saturation during breathing 100 per cent oxygen did not reach 100 per cent, as it did in those with only a left-to-right shunt.

The author explains this finding on the basis of great augmentation of pulmonary capillary flow. In persons with large left-to-right shunts it is necessary for several times the normal amount of blood to flow through pulmonary capillaries in a given time as in the normal state. This is accomplished by dilatation of the capillary bed and increased linear velocity of blood flow. During exercise there is even greater increase in these changes. As a result there is a functional barrier to the complete transfer of oxygen from the alveolus to the blood stream, since there is insufficient exposure time for the erythrocytes in the stream. Administration of 100 per cent oxygen increases the partial pressure of oxygen in the alveoli and tends to overcome the fault.

In view of the facts that right-to-left shunts may occur without cyanosis, that cyanosis may occur without a right-to-left shunt, and that the intensity of cyanosis is not entirely dependent upon arterial anoxemia, the author offers a revision of Abbott’s classification of congenital heart disease. The au-
CONGESTIVE HEART FAILURE


In 20 cases with auricular fibrillation of various etiologies and chronic congestive failure, different methods of treatment with Lanatoside C (Cedilanid) were studied and compared. In 17 instances full compensation was achieved as evidenced by clinical signs and normalization of venous pressure and circulation time.

In comparing the various methods of administration of the preparation, it was found that rapid digitalization by massive intravenous doses precipitates signs of intoxication which disappear 24 hours after termination of treatment. The same is true with rapid oral digitalization. Contrary to it, signs of intoxication are minimal or absent if digitalization is carried out slowly by the oral route, or more rapidly by divided intravenous doses. As methods of choice the author recommends the following plans: For oral digitalization, 3 mg. Cedilanid the first day, 2.5 mg. the second day, followed by doses of 2 mg., 1.5 mg. and 1.0 mg., the latter continued; for intravenous digitalization, an initial dose of 0.8 mg. followed in four-hour intervals by 0.4 mg., or, in less urgent cases, in 24 and 48 hours by 0.4 and 0.2 mg.

Owing to its great therapeutic range and the rarity and transient character of its toxic effects, Cedilanid is especially indicated in cases in which prolonged digitalization is necessary and frequent medical control impossible.

Pick


Intensive mercurial diuresis in three patients with congestive failure was followed by an aggravation of the edematous state and the development of azotemia. These untoward reactions were promptly relieved by the intravenous administration of hypertonic salt solution. These adverse sequelae to the mercurial diuretics in these cases are ascribed to increased viscosity of the blood with resultant impairment of glomerular function, and to a paradoxical shift of sodium chloride from the extracellular fluid compartment into the cells.

Wendkos


The authors studied the potentiation of mercurial diuretics by ammonium chloride in normal dogs. This potentiation is not the result of increased acidity of the urine and body fluids induced by the acidifying salt. The more significant finding is an alteration in anion pattern of the body fluids, particularly a substitution of chloride for bicarbonate. After Salysrkan, the excretion of chloride regularly exceeds that of sodium, and there is frequently a fall in plasma chloride with a rise in plasma bicarbonate.

The authors suggest that mercurial diuretics specifically block chloride absorption, and the effect of ammonium chloride on diuretics is a consequence of the hyperchloremia which is induced.

Waife

CORONARY ARTERY DISEASE, MYOCARDIAL INFARCTION


A 24 year old diabetic male was admitted to the hospital with the typical clinical picture of sepsis associated with loud systolic precordial murmurs. Blood cultures yielded numerous colonies of Staphylococcus aureus hemolyticus. A diagnosis of acute bacterial endocarditis due to this organism was therefore made. Subsequently, because of evidences of cardiac irregularity and cardiac failure, serial electrocardiograms were made, and the findings in these cardiograms established the presence of a recent posterior wall myocardial infarction. It was therefore supposed that the infarct was the result of a septic embolus to the right coronary artery.

At autopsy, this suspicion was confirmed. On the aortic valve cusp overlying the right coronary orifice, there was a large fungating vegetation which apparently had extended upward into the aorta and from which an embolus had lodged within the right coronary artery, 6 mm. from its origin. This embolus within the right coronary artery was obviously
a purulent embolus. Distal to this occluded coronary artery, the lumen was normal. Fully half of the posterior portion of the interventricular septum was comprised of patchy, yellow-white areas, some with dark red borders and all being fairly firm. These were recognized to be myocardial infarctions. Associated, but unsuspected, was the finding of renal lesions which were characteristic of a necrotizing renal papillitis. The renal lesion was not considered to be related to the bacterial endocarditis, but it was believed to be due to the diabetic state.

WENDKOS


One hundred cases of cardiovascular lues, 13.4 per cent of the autopsy reports examined, were studied. Twenty-one cases had a descending myocarditis, that is, a luetic myocarditis transmitted by contiguity from the aorta.

The clinical diagnosis of this type of myocarditis is considered difficult. The best diagnostic sign seems to be incomplete left bundle branch block in a luetic patient without aortic regurgitation. Protracted heart failure was constant, irrespective of aortic regurgitation or coronary insufficiency.

LUISADA


The term “myocardiosis” was originally introduced by Wuhrmann to designate certain degenerative changes of the myocardium associated with dysproteinemia of various etiology, especially those found in liver disease. However, similar histologic changes—edema, sarcoysis and destruction of myocardial fibers, and widening and fatty infiltration of the interstitial spaces of the myocardium—are also found in other conditions which are not associated with disturbance of the protein metabolism, for example in various intoxications; on the other hand, these changes may be absent in cases with severe dysproteinemia, as in multiple myeloma and in the nephrotic syndrome.

The author suggests use of the term “myocardiosis” more widely to designate generally degenerative changes of the myocardium instead of restricting this name to alterations found in one specific condition. A series of cardiologic disorders known under specific terms like the “heart in hyperthyroidism and myxedema,” the “beri-beri heart,” the “heart in amyloidosis,” the “heart in Van Gierke’s disease” and “changes occurring with derangement of the electrolyte balance” could be covered by a common name “myocardiosis.” Thus the whole group of degenerative alterations of the myocardium could be put in sharp contrast to changes due to inflamma-

tion (myocarditis), and to changes on a vascular basis (“myocardiolosclerosis”).

PICK


The first of these cases was a 67 year old white male who was originally admitted to the hospital with the clinical syndrome of acute myocardial infarction. This diagnosis, however, was not clearly substantiated by the electrocardiogram. He developed further respiratory distress and the clinical features of an acute pulmonary embolism. He developed difficulty in swallowing. The x-ray examination of the chest indicated the presence of enlargement of the right side of the heart, and it was suspected, therefore, that he had dilatation of the right atrium with eventual compression of the esophagus. At necropsy, these suspicions were confirmed; and it was found that in addition to marked dilatation of the right atrium, there were many small aneurysms of the right atrium and that there were many clots filling these aneurysms. Examination of the lungs indicated the presence of multiple pulmonary emboli which obviously had their origin in the atrial thrombi. The ventricle, although scarred and fatty, was not infarcted.

The second case was that of a 69 year old white male who was admitted with the typical clinical features of acute myocardial infarction. The diagnosis was confirmed by an electrocardiogram which revealed typical changes of a recent posterior wall infarct involving the left ventricle. In addition, there were elevations of the P-Q interval in leads II and III, and for this reason an associated infarct of the atrium was suspected. At necropsy, these suspicions were confirmed.

It is because of the rarity of atrial infarction and because the electrocardiographic features of the lesion are not yet sufficiently appreciated that the authors have reported the details of these two cases.

WENDKOS


The authors present ballistocardiograms recorded in 24 patients suffering from coronary heart disease. Only five of these patients had electrocardiographic evidence of myocardial infarction, while 10 suffered from hypertension. An abnormal ballistocardiogram resulted in every case, ranging from grade 3 to grade 4 of Brown’s classification. The authors stress the practical value of ballistocardiography in order to detect the presence of coronary heart disease, where other methods, including Master’s two-step test, have failed.

LUISADA

Ballistocardiographic findings in 195 cases are presented and correlated with results of the Master two-step exercise electrocardiogram. Twenty-seven patients of 113 with negative two-step electrocardiographic tests had abnormal ballistocardiograms either at rest or after standard exercise. Seventy of 75 with positive two-step tests had abnormal ballistocardiograms, and six out of seven with borderline two-step tests had abnormal records.

The authors point out that the character of the ballistocardiographic waves depends on velocity and force of cardiac ejection, and has no direct correlation with the results of electrocardiography. Pathologic changes in the conduction pathways or in the myocardium itself may produce changes in the electrocardiogram. However, the mechanical function may be sufficiently impaired to produce changes in the ballistocardiogram without enough disturbance to alter the electrocardiogram. In a small percentage of patients with definite evidence of coronary artery disease in this series, the ballistocardiogram remained normal.

Further study of these cases is required to determine whether or not the finding has any prognostic value. Similar further study in the group of patients with negative electrocardiographic findings and normal ballistocardiograms is necessary before the complete significance of the findings is understood. The authors feel the ballistocardiogram is a useful tool in the diagnosis of coronary artery disease but should be used in conjunction with careful history, physical examination, and electrocardiographic study. The test should be recorded after standard exercise if the resting record is normal because cardiac ejection force may be impaired only after exertion.

Kitchell


The authors analyzed tracings obtained with Dock's ballistocardiograph in 36 normal persons of various age and in 24 patients with coronary disease. In the normal cases the magnitude of the various ballistocardiographic deflections was measured as recorded during apnea, in deep inspiration and expiration, and following exercise. The results were studied from a statistical point of view and the normal limits for various deflections were determined.

Of the 25 cases with coronary disease, five suffered from angina following myocardial infarction, 17 had anginal pain without evidence of myocardial infarction, and three had electrocardiographic evidence of coronary disease without clinical symptoms. The ballistocardiogram was abnormal in all of them. The alterations became more marked following an exercise tolerance test, regardless of the presence or absence of electrocardiographic changes. The ballistocardiogram, therefore, appears to be of definite value for the diagnosis of coronary disease.

Pick


This report is concerned with 54 consecutive cases of coronary thrombosis with or without myocardial infarction occurring in 52 diabetic patients observed at the Pennsylvania Hospital over an interval of six and one-half years. In this series 64.8 per cent of the patients were women in contrast to a female incidence of 21.2 per cent in a large group of nondiabetic patients observed at the same hospital during the same period. The over-all mortality was 40.8 per cent. The mortality was higher in women, in those patients who had previous coronary thrombosis, and in those whose diabetes had been inadequately controlled. The statistics accumulated in this study suggested that a diabetic man is 1.3 times as likely as his nondiabetic neighbor to suffer coronary thrombosis, whereas in a woman the possibility of coronary thrombosis is increased 14 times if she is diabetic. In this series one in five women with coronary thrombosis was also a diabetic. The role of obesity and various unknown hormonal factors in the shift of the sex incidence of coronary artery disease in diabetes is given some consideration by the author.

Rosenbaum


The problem of coronary artery disease in pregnancy occurred in four patients in the author's series. In addition, 21 cases are summarized from the literature and the general management of these patients is discussed. The total mortality for the 25 patients, who ranged from 19 to 45 years of age, was 24 per cent.

Probable myocardial infarctions were recorded in 15 patients: three occurred prior to pregnancy, ten during the antepartum period, one occurred intrapartum and one postpartum. The latter two died and two infarctions were fatal during the antepartum course; two other patients died among the group of 10 without infarction but with anginal syndrome due to coronary insufficiency. Some of the earlier cases were inadequately studied and may represent errors in diagnosis. It was found that once an infarct has healed, the hypervolemia associated with pregnancy was not a serious problem.

Coronary artery disease should not be consid-
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cered as an indication for interruption of pregnancy or for cesarean section. Nor is coronary artery disease a contraindication to these surgical procedures where other obstetric indications are present. One of the author’s patients was treated for two months during pregnancy with dicumarol for a coronary occlusion. The prothrombin time was maintained at approximately twice normal. The treatment was satisfactory and a normal child was born.

SHUMAN


Determining cardiac output by the dye injection method of Hamilton, the authors studied 11 patients with acute myocardial infarction, seven normal male subjects, and five hypertensive patients. Special modifications in the usual technique were made so as not to disturb unduly these acutely ill subjects. It was found that hemodynamic changes varied with the clinical state of the patient. The mean cardiac index was about 4 liters per minute in the normal young subject; 3.2 in the hypertensives who were more comparable in age to the patients with myocardial infarction; in those who showed little or no evidence of shock or congestive failure following infarction the cardiac index was about 3.4 liters per minute; in those whose illness was moderately severe, 2.9 liters per minute; and in the group suffering from cardiogenic “shock,” all of whom were severely ill with extreme prostration and with the clinical appearance of shock, the mean cardiac index was 1.8 liters per minute. In general the heart rate increased with increasing severity of the infarction. The mean femoral pressure varied from 95 mm. Hg to 79 in the three groups of infarctions. Extreme hypotension was not observed in these subjects, even in those who appeared clinically to be in “shock” and who later died. There was a significant reduction in stroke volume paralleling the three groups of infarction clinically. Thus, those who were in the mild group had a stroke volume of about 76 cc. It was 50 cc. in the moderately severe group, and only 27 cc. in those who had “shock.” Similarly, the total peripheral resistance was strikingly increased in the cardiogenic shock cases.

In short, in severe myocardial infarction there was a reduction of cardiac output, especially stroke volume, an increase in heart rate, total peripheral resistance, central venous pressure, and average circulation time. The less severe cases did not show these abnormalities.

The authors suggest the following sequence of events after severe myocardial infarction: A diminished contractility and a failure in stroke output.

The consequent reduction of arterial pressure immediately, resulting in the activation of neurogenic reflexes and possibly other compensatory mechanisms, produces an increase in total peripheral resistance and tachycardia. This intense vasoconstriction in the presence of reduced stroke volume may be followed by a fluid retention syndrome which may result in congestive heart failure as well as shock-like state. Although these compensatory mechanisms aid in maintaining aortic pressure and hence coronary blood flow, they also may have harmful consequences by adding extra burdens to an already damaged heart. Thus, an elevated total peripheral resistance increases the work of the heart; tachycardia also adds to cardiac work and results in a less effective stroke output; and vasoconstriction results in increased venous filling pressure in the presence of a failing heart.

WAEFFE


A total of 51 consecutive patients admitted to the hospital with a diagnosis of probable myocardial infarction were studied to determine the response of the fasting eosinophil count to their disease and to note whether the occurrence of secondary falls in eosinophil counts would aid in the early detection of complications. The patients were later classified into two groups: group 1, those with definite acute myocardial infarction (23 cases); group 2, included angina pectoris, pulmonary edema, probable myocardial infarction, heart failure, and chest pain (28 cases). Eosinophil counts were made on venous blood by Randolph’s method using a value of 50 or more per cubic millimeter as normal.

Patients with acute myocardial infarction usually, but not invariably, had an early eosinopenia. The lack of an eosinophil fall in infarction patients who had uncomplicated recoveries was probably not on the basis of an inadequate adrenocortical response to stress, although hormonal studies were not made. It was found that acute pulmonary edema was associated with extreme eosinopenia. The eosinophil response did not aid in the prognostic evaluation of the cases, nor did it appear to be of importance in determining the presence of complications, inasmuch as wide fluctuations were noted in the absence of any apparent clinical cause.

SHUMAN

ELECTROCARDIOGRAPHY


The authors present data on nine observations of
acute cor pulmonale, in two of which massive pulmonary embolism was proved by autopsy. In addition to the typical clinical symptomatology, the venous pressure was elevated during the initial stages of the accident, and subsided in the next few days. X-ray examination revealed that because of acute right heart strain, the heart shadow became more horizontal and enlarged in its transverse diameter and the pulmonary vascular markings more prominent.

The characteristic electrocardiographic pattern of McGinn and White was found in seven cases in whom a tracing was obtained within 24 hours following the episode. Within the next days the right axis deviation of QRS and the left axis shift of the T wave showed a tendency to regression towards normal. S-T deviations and T inversions in the right-sided chest leads became more pronounced in later stages of acute cor pulmonale.

**Pick**


In order to amplify previous observations made with the three standard leads, the authors used unipolar leads in a study of changes of the electrocardiogram produced by pregnancy. Deviation of the electrical axis to the left found in the majority of cases is usually due to horizontal position of the heart in association with elevation of the diaphragm. In some cases, however, the axis shift was to the right, and this was to a greater degree during pregnancy than in controls after delivery. This is ascribed by the authors to alterations in transmission of potentials to the left leg, caused by the pregnant uterus. The appearance of an isolated Q in lead III they explain by “vertical position of the heart with rotation to the right along the longitudinal axis, and projection of the apex in forward direction.” Qs associated with an inverted T; in hearts with the same rotation, but in more intermediate position. In three instances, there was an inversion of the T wave in the precordial leads, and in one instance an abnormal spatial position of the ventricular gradient. Such findings suggest that, apart from positional changes, some other “functional” factors may modify the electrocardiogram during normal pregnancy.

**Pick**


Two hundred consecutive cases of acute poliomyelitis were followed by serial electrocardiograms taken at about 10-day intervals. Definite alterations were found in 11.5 per cent; and when divided in age groups, in 4.2 per cent of 72 children, and 15.6 per cent of 128 adults. The changes consisted in abnormalities of the T wave and occasionally in disturbance of rhythm (A-V block, and auricular fibrillation and flutter). They were found frequently in association with abnormal clinical findings (persistent tachycardia) or subjective cardiac sensations, and in cases with involvement of the bulbar nuclei. The majority of the changes appeared in the first to second week of the disease and persisted about one month, sometimes six months to a year. In some cases the associated symptoms suggested a neurovegetative disturbance with increase of the sympathetic tone. This could be proved in several instances by the results of amyl nitrite and dihydroergotamine tests.

**Pick**


In a patient with clinical signs of chronic cor pulmonale, the following unusual electrocardiographic pattern was recorded: small r’s in lead I; deep QS waves in leads II and III; upright T waves in all three limb leads; aVr and aVl were similar in contour, showing a small upright QRS and inverted T wave, while aVp was the mirror image of these two leads; in the precordial leads, a QS present from V1 to V5, a rS in V6, and the T wave was inverted in V1 to V3, and upright in the left-sided chest leads.

In order to explain these findings, the zone of transition of upright to inverted QRS complexes (left and right ventricular potentials) was determined in various planes of the thorax. The distribution of these two contours over the thorax suggested that the unusual pattern in the conventional leads was due to an abnormal anatomical position of the heart, effected by marked clockwise rotation on the longitudinal and antero-posterior axes, with simultaneous backward rotation of the apex.

**Pick**


The concept of vectorcardiography implies two basic assumptions, namely homogeneity of the thoracic electrical field and identity of the origin of the cardiac vector with the center of the heart. While the first assumption is supported by the possibility of finding mirror image potential on diametrically opposed positions of the chest, the second seems to be invalid, since intersections of the axes connecting mirror image potentials do not always traverse the center of the heart, determined radiologically. Studying this problem, the authors found that the electrical center was located outside and dorsally to the heart shadow in 21 per cent of normal cases, in 60 per cent of cases with right ventricular hypertrophy, and in almost 50 per cent of cases with left ventricu-
lar hypertrophy or generalized cardiac enlargement. The greater incidence of these findings in pathologic hearts may be partly due to alterations in position, especially rotation of the heart in association with increase of its size.

**Pick**


A case is reported of rheumatic mitral stenosis with Wolff-Parkinson-White syndrome, followed by flutter and fibrillation. Autopsy with incomplete microscopic study failed to reveal any accessory bundle on the right side. Two types of ventricular complexes were noted during auricular fibrillation; the wider complexes, similar to those recorded when the sinus rhythm was still present, are interpreted as caused by anomalous A-V excitation.

In cases with auricular fibrillation and abnormal excitation, the combined use of digitalis plus quinidine is recommended.

Considerations upon the mechanism of production of similar disturbances exclude the theory of an irritative focus but fail otherwise to clarify the obscure syndrome reported.

**Luisada**


Incidence and significance of notched, upright T waves are studied. They were observed in 16 per cent of the tracings from a series of 1000 electrocardiograms. While notched T waves were infrequently observed in the limb leads, and more frequently in the precordial leads, among normal subjects, they were frequently observed in the limb leads, and even more frequently in the precordial leads, of pathologic cases.

The significance of notched T waves is discussed. Notching of T is noticed under the same conditions which cause inversion of T; both notching and inversion of T can be observed simultaneously, and this is not unusual in impairment of the coronary blood flow.

The true notching of T should be differentiated from an apparent notching caused by fusion between U and T waves.

**Luisada**


A comparative study of 71 normal cases with a deep Q wave in lead III, and 40 cases showing this sign as consequence of myocardial infarction, revealed that currently used criteria for normal and abnormal Q waves, based on measurements of width and size of the deflection, are unreliable. About one half of the normal cases, and about one third of cases with proved myocardial infarction, were "exceptions to the rule." Association of Q3 with a Q wave in lead II and aV5, and its persistence in deep inspiration, proved more consistent with the diagnosis. This was especially brought out by vectorial analysis of the tracings. Vectors producing a deep Q wave in normal persons are located in a mainly horizontal segment of the frontal plane and, hence, are most susceptible to respiratory variations. Contrary to this, a Q vector indicating posterior myocardial infarction is found in a more vertical segment of the frontal plane, and its position is much less variable with deep respiration.

**Pick**


The authors studied cases with the electrocardiographic syndrome of a small r in lead I and deep S waves in leads II and III. In the presence of this pattern, which was termed by others "discrepancy type," the possibility of an anterior wall infarct should always be considered, even when a distinct R wave is seen in lead II. In association with QRS prolongation, the pattern is frequently seen in the combination of anteroseptal infarction and right bundle branch block; the latter, however, can be recognized only in precordial leads, while the limb leads resemble more left bundle branch block. This apparent disagreement of limb leads and precordial leads is due to the change of the usual limb-lead pattern (namely, reduction of the prominent T wave in lead I) by ischemic myocardial destruction, rather than to an anomalous position of the heart. In rare occasions, the precordial leads indicate that the syndrome can occur in association with a left-sided conduction defect; and, sometimes, a completely atypical precordial pattern renders the localization of the intraventricular conduction defect to one or the other side extremely difficult or impossible.

**Pick**

Whitehorn, W. V., and Bean, J. W.: Cardiac Changes Induced by O2 at High Pressure, High CO2 and Low O2 as Manifest by the Electrocardiogram. Am. J. Physiol. 168: 528 (Feb.), 1952.

Decerebrate dogs were used. High oxygen (60 per cent) produced bradycardia and prolonged P-R interval which progressed to A-V block with longer exposures. P Waves were decreased or suppressed. Ventricular premature contractions and nodal rhythms were common with longer exposures. When the heart failed, the pacemaker and conduction were at fault. vagotomy or vagotomy and stellatectomy increased the time required for the onset of findings but did not prevent them from appearing. High
carbon dioxide and low oxygen effects were very similar.

**Oppenheimer**


The authors analyzed eight cases which, in the course of observation, showed the electrocardiographic syndrome of a small T wave in lead I associated with a tall T wave in III, and they arrived at the following conclusions:

The syndrome is suggestive but not diagnostic of coronary disease with infarction of the anterior wall. It is also found in incipient left ventricular hypertrophy, as a sign of digitalis effect, and in hearts with vertical position. If due to anterior wall infarction, it is usually associated with changes in the precordial leads and/or aVl. The syndrome is seen commonly during the healing stages of anterior infarction and rarely in its initial stages, and seems to indicate a favorable prognosis. It develops sometimes in the course of transitory ischemia of the myocardium, without confluent infarction, and hence may be considered to be one of the manifestations of acute coronary insufficiency.

**Pick**

**HYPERTENSION**


Subjects with Cushing’s syndrome have an abnormal response to salt loading and the administration of desoxycorticosterone, in that they do not retain most of the salt following administration of this hormone.

Ten ambulatory male patients with essential hypertension were studied by means of this salt tolerance test. Nine of the ten patients showed a retention of chloride, and all ten showed a retention of sodium after salt loading and desoxycorticosterone acetate. Therefore, patients with essential hypertension did not show an electrolyte abnormality of the type found in patients with adrenal cortical hyperfunction (the Cushing syndrome).

**Waife**


The pH of a group of 19 patients with essential hypertension and normal kidney function was found to have a mean of 7.36, as compared to 14 normotensive subjects with a mean pH of 7.41. The increased acidity of the blood in hypertensives was accompanied by an increased carbon dioxide tension which averaged 47.4 mm. of Hg, compared to 39.6 mm. in normotensives. This is the pattern of primary respiratory acidosis. Hypertensives with impaired renal function showed a picture typical of metabolic acidosis with a low pH and a low carbon dioxide tension.

**PATHOLOGIC PHYSIOLOGY**


The author discussed the causes of arterial spasm or other alterations in the size of large arteries, and means to combat this pathologic state. He found that direct stimulation of the femoral artery in the rabbit, using a faradic current, caused a contraction of the middle third of the vessel. Lumbar sympathetic stimulation produced a marked contraction of the distal third of the artery but not the upper third. With the intravenous injection of epinephrine, the lower part likewise became narrower, while the upper part actually dilated with the rise in blood pressure.

In man the author found that a similar state existed. Electrical stimulation of such vessels as the dorsal pedal artery caused contraction, while the same agent applied to the common femoral had no effect. On the other hand, the large vessels went into spasm when subjected to mechanical trauma. An intact sympathetic nerve supply was not necessary for the maintenance of this state, the local arterial spasm persisting for long periods after the sympathetic nerve supply had been removed from the vessels by periarterial sympathectomy.

Various procedures were tried to remove spasm. Intravenous administration of papaverine, caffeine, and priscoline was without effect on the spastic arteries, although each drug caused rapid relaxation when applied locally to the vessels. The direct use of benzodioxane produced partial relaxation, while inhalation of amyl nitrate had no effect. Of all the drugs tried, papaverine was the most consistently successful in eliciting permanent relaxation when applied locally. The spasm produced by mechanical trauma could not be relieved by sympathectomy.

It was concluded that in case of injury to an artery, early exploration is essential in order to distinguish between true spasm and compression of the vessel by bleeding. If spasm does exist, the entire segment of contracted artery should be exposed and then covered by a warm 2.5 per cent solution of papaverine sulfate and left for a few minutes. If relaxation does not occur within 10 to 15 minutes, the wound should be loosely closed, leaving a fine polyethylene tube in contact with the vessel for instillation of 1 per cent papaverine at intervals until the circulation is restored.

**Abramson**

Catheterization of the renal veins was performed in 13 subjects. Three of them were normal subjects; three had cardiac failure; two suffered from hyperthyroidism; while five suffered from various other noncardiac ailments.

Renal venous pressure averaged 9 cm. water in normal subjects, and 20 cm. water in heart failure. Oxygen saturation averaged 90 per cent in normal subjects, 82 per cent in cardiac patients, and presented slight variations in other patients. Oxygen arteriovenous difference in renal blood was 1.23 per cent in normal subjects, while it was 4.22 in mixed blood. In cardiac failure, the A-V difference of the renal blood increased to 2.85 per cent; in the patients with hyperthyroidism, the difference was found low in the mixed blood.

The absorption coefficient of oxygen of the renal blood averaged 5.0 per cent, whereas it was 22 per cent in the systemic blood; the coefficient was higher in cardiac failure (average 10 per cent), corresponding to the increased value in the systemic blood. It was also higher in hyperthyroidism (9.5 per cent) and in patients with acute hepatitis.

The results of the study are correlated with the clinical findings.

Luisada


In a patient with partial respiratory paralysis, in consequence to poliomyelitis, discontinuation of artificial breathing resulted in bradycardia and elevation of the arterial pressure. The mechanism of these alterations was studied by recording continuous electrocardiograms and determinations of the oxygen and carbon dioxide saturation of the peripheral blood during a short period of depressed respiration. The experiments were performed with the patient breathing normal air and pure oxygen.

The study revealed that the blood pressure elevation was associated with the development of hyperkapnia, while slowing of the heart rate was related to hypoxemia. The mechanism of the bradycardia, as revealed by the electrocardiogram, consisted in the following sequence of events: First sinus bradycardia with successive displacement of the pacemaker towards the A-V node, and finally to a ventricular focus under disappearance of signs of sinus activity. With reoxygenation, restitution to normal rhythm took place in the reversed order. Thus, the cardiodynamics in asphyxia, studied for the first time in man, are similar to those observed by others in the animal experiment.

Pick


The authors present a comprehensive review of sarcoidosis, particularly the pathologic and clinical features of this protean disease. Though involvement of lymph nodes, lungs, skin, spleen, liver, eyes and bones are well known, comparatively little attention has been paid to the cardiovascular damage resulting from direct myocardial involvement or from the effects of pulmonary sarcoidosis.

Cardiac involvement has been found in about 20 per cent of autopsies (including those reported in the literature). The lesions vary from scattered solitary tubercles in the myocardium to extensive infiltration of the muscle of both ventricles by great masses of sarcoid tissue. Death due to chronic heart failure or sudden death may occur in the cases with overwhelming infiltration. In the cases with minor degrees of involvement temporary disturbances may occur during the kaleidoscopic course of sarcoidosis. Various arrhythmias and tachycardias may accompany myocardial failure. Minor irregularities and electrocardiographic abnormalities without other cardiac symptoms are comparatively common.

A complication of severe pulmonary involvement is cor pulmonale. The latter may be quite severe in cases of infiltrating pulmonary sarcoidosis, in which a condition of "alveolar-capillary block" hastens the deterioration produced by the accompanying emphysema and the mechanical interference with blood flow through the small pulmonary vessels. Cardio-respiratory failure secondary to pulmonary hypertension and marked anoxia may terminate the life of many patients with pulmonary sarcoidosis. The characteristic features of this group of cases are dyspnea and cyanosis. It is to be hoped that continuation of current studies of the effect of adrenocorticotropic hormone and cortisone upon sarcoidosis may lead to a better understanding of the disease and better clinical results.

Enselberg

PATHOLOGY

Grewin, K. E.: Two Cases of Polypus Cordis. Cardiologia 20: 40 (Fasc. 1), 1952.

The author presents clinical data of two instances of a large pedunculated myxomatous tumor of the left auricle, revealed by autopsy. Both cases showed during lifetime signs of chronic heart failure, one with unexplained attacks of suffocation, the other with sudden unexplained deterioration of the condition. This could have, according to the author, suggested the correct diagnosis. In view of the recently developed technics, surgical removal of tumors located in the left auricle appears possible. The literature was reviewed in order to establish criteria for intravitam diagnosis of the condition.
Signs which may arouse suspicion of the presence of a left auricular tumor are especially sudden appearance and disappearance of auscultatory signs of mitral stenosis, and attacks of syncope and unconsciousness, related to postural changes and not referable to heart block.

**PICK**


A 5 weeks old female infant, dyspneic from birth, showed at examination enlargement of the heart to both sides and of the liver to the umbilicus. With improvement under treatment with digitalis, a systolic murmur appeared over the precordium. The child died on the thirty-ninth day of life with signs of bronchopneumonia. At autopsy, diffuse fibroelastosis of the endocardium was found, most marked in the left ventricle. The leaflets of the mitral valve were thickened and shortened, and its chordae tendineae were thickened and showed abnormal insertion, both resulting in severe stenosis of the mitral orifice. The aortic valves were hypoplastic, the left ventricle unusually small, the left auricle dilated, and both right auricle and ventricle dilated and hypertrophied. The coronary vessels were normal.

The author rejects fetal endocarditis as the cause of this deformation and favors the possibility of a primary malformation of the endocardium and valves, with secondary changes in the cardiac structures, due to alterations of the direction of blood flow through the heart.

**PICK**


Two types of glomerular lesions occurring in diabetic glomerulosclerosis, the nodular lesion and the exudative lesion, are briefly described on the basis of the findings in a series of 135 diabetic patients. Postmortem findings in 8 cases of Kimmelstiel-Wilson’s syndrome dying in uremia show gross atheroma with much narrowing of the renal arteries.

Atheromatous involvement of the large and small branches of the renal artery gave the kidney a characteristic macroscopic appearance. The histologic picture in all 8 cases showed ischemic obliteration of vast numbers of glomeruli. The pathogenesis of the massive obliteration of glomeruli is discussed, and it is concluded that obliteration results from atheromatous narrowing of the renal arteries superimposed on severe arteriolosclerosis.

**BERNSTEIN**


The author attempted to estimate the importance of lesions of the pulmonary vascular tree as a morphologic basis for right ventricular hypertrophy that was found in 111 instances of pulmonary heart disease in 6770 consecutive necropsies.

The cases were divided into three groups: Group I consisted of obstructive lesions of the pulmonary vascular system of which there were (a) four with pulmonary arteritis resembling periarteritis nodosa, (b) two with metastatic tumor, one of multiple embolization and the other of lymphangitis with reactive fibrosis that occluded vessels, (c) five with recurrent embolizations lasting from months to five years. Group II included five instances without morphologic lesions in the pulmonary vasculature or parenchyma, so-called primary pulmonary hypertension. Group III consisted of 39 with emphysema. Severe sclerosis was found in 17 per cent of these as compared to 10 per cent of emphysema without right ventricular hypertrophy and 7 per cent in controls.

The author concludes that the pulmonary vascular changes cannot be regarded as a morphologic basis of right ventricular hypertrophy. At the most, one may say that it accentuates slightly the normal age changes in the pulmonary vasculature.

**SOLOFF**

Heard, B. E.: An Experimental Study of Thickening of the Pulmonary Arteries of Rabbits Produced by the Organization of Fibrin. J. Path. & Bact. 64: 13 (Jan.), 1952.

Large autogenous worm clots were converted into fibrous tissue in the pulmonary arteries of rabbits inside a month or six weeks. Small autogenous clots produced by intravenous magnesium adenosine triphosphate with Russell viper venom and by Harri-son’s technic appeared to leave the lungs within about two days. It is suggested that while small clots were destroyed by a fibrinolysin, large clots survived long enough to become organized and converted into fibrous tissue. The degree of intimal change in the pulmonary vessels visible after six weeks, however, was extremely slight. It is possible that fibrinolysis may be less efficient in the systemic arteries of human beings and may be reduced in activity by certain changes in the condition of the body over the long period of development of human atherosclerosis. This would allow thrombi to persist long enough to become organized and converted into fibrous thickening.

**BERNSTEIN**

**PHARMACOLOGY**


This is a report on a patient who, while receiving treatment for tuberculous meningitis, developed unexplained electrolyte abnormalities from which she
died. The biochemical findings on the last two days of life were those of a hypochloremic hypokalemic alkalosis. There seems to be good circumstantial evidence that liquorice was responsible for the electrolyte changes shown by this case. It has been shown that liquorice has a desoxycoarticotone-like action, and several other patients who received P.A.S. flavored with liquorice developed tetany with hypokalemia. The P.A.S. could hardly have produced the observed electrolyte changes, because salicylate causes a respiratory alkalosis with low-alkali reserve, but the addition of a mild respiratory alkalosis to the metabolic alkalosis caused by the liquorice would favor the occurrence of tetany.

Bernstein


A group of 18 subjects with various diseases was studied by the nitrous oxide technic. Cerebral circulatory studies were performed before and after the intravenous administration of papaverine hydrochloride in doses of 0.2 Gm. in 200 cc. normal saline over a 15 to 20 minute period. It was found that this drug led to a 13 per cent increase in cerebral blood flow, with a reduction in arterial-cerebral venous oxygen difference, so that cerebral oxygen consumption showed no significant change. There was a significant decrease in cerebral vascular resistance and fall in arterial pressure. There is suggestive evidence that papaverine probably causes arteriolar dilatation, although not localized to the brain.

Waife


Ouabain was found to raise significantly the respiratory quotient of intact rat auricular tissue, mainly by increasing the production of carbon dioxide more than the oxygen uptake. At toxic levels the carbon dioxide production decreased from its maximum level at a faster rate than did oxygen consumption. The respiratory quotient of auricles contracting under tension was greater than when the tissue was not exposed to tension, since they were due to a higher rate of metabolism. Ouabain caused a biphasic response on respiration, depending upon its concentration. The increased respiratory phase of the ouabain effect did not result from an increased rate of contraction of the tissue. The authors believe that their results favor the theory that the cardiac glycosides stimulate the oxidative respiratory system of the myocardial cells by increasing the amount of endogenous metabolites consumed so that each contraction results in a greater increase in carbon dioxide production than it does in oxygen utilization.

Sagall


The effect of procaine amide upon the circulation was studied in normal persons, using cardiac catheterization. The drug was injected in doses of 500 to 800 mg., either intravenously or directly through the catheter into the right ventricular cavity. In six out of seven experiments, the arterial pressure dropped within 10 minutes following the injection, the systolic pressure maximally by 40 mm. and the diastolic by 20 mm. Cardiac output and the cardiac index increased in all instances. With exception of a slight prolongation of the P-R interval and of the QRS duration, no changes were observed in the electrocardiogram.

The authors ascribe the observed changes of the hemodynamics to a twofold action of procaine amide upon the circulation, consisting in peripheral vasodilatation and a depressant action upon the myocardiun. While the former action dominates in normal subjects, myocardial depression becomes manifest in diseased hearts. This may explain some apparent disagreement of the results of the present study with those reported by others in subjects with cardiac pathology. In view of these observations, intravenous administration of procaine amide requires caution and should be used only with strict indications.

Pick


In control experiments 88 per cent of dogs died of hemorrhagic shock. If animals were given aureomycin hydrochloride until two successive stool cultures were free of Escherichia coli and clostridia (10 to 12 days) 88 per cent survived. It was later discovered that six days of pretreatment (2.5 Gm. twice daily) was adequate, whether or not stool cultures were free of the two organisms mentioned at this time. The authors conclude that bacterial action facilitates the development of irreversibility to transfusion in hemorrhagic shock.

Oppenheimer

The ganglionic blocking agents, pentamethyldiethyl-3-azapentane-1,5-diammonium-dibromide (C-9295) (Pendiomide), tris-(2-diethyl-aminomethyl)-amine trihydrochloride (Su-1194), hexamethonium (C₆) and tetraethylammonium chloride (Etamon), as well as Veratramine and tincture of Veratrum viride, antagonized the tachycardia produced by Regitine in 60 experiments on dogs under sodium pentobarbital anesthesia.

**BERNSTEIN**


The effect of several physical therapies on the volume blood flow through the hind extremities was studied on a series of unanesthetized adult dogs. Massage produced little increase in local circulation, while passive stretching caused a significant augmentation in normally innervated and spastic limbs but not in those that were denervated. Electrical stimulation of muscle was followed by a definite increase in blood flow, although during the actual period of tetanic contraction there was a decrease. The consecutive application of three packs caused an augmentation in the normally innervated limb but no change when the skin was previously treated with Butesin.

The question was raised as to whether the increase in blood flow following application of heat and exercise was worthwhile, since there was a simultaneous rise in the metabolic needs of the affected tissues.

**ABRAMSON**


To the series of 348 cases of arrest of the heart reported in the literature, the author added two of his own. Of this number recovery occurred in 112. In those instances in which cardiac massage was carried out, 110 of 212 lived. Only three of the patients who recovered showed residual effects.

It was concluded that cardiac massage is the procedure of choice and that this should be instituted within five minutes after arrest has occurred and not when all other measures have failed.

**ABRAMSON**

**PHYSICAL SIGNS**


In 32 necropsied cases with subendarcoidal hemorrhage located mainly in the outflow tract of the left ventricle, a study of clinical data revealed signs of vagal stimulation as a common denominator. Thus, in one group of patients there was evidence of increased intracranial pressure, and in another group enlargement of cervical nodes was found in proximity to the vagus nerve. One case died a “bolus death” after an attempt to swallow a big piece of sausage, and another shortly after a thyroid operation from bleeding into the mediastinum. Among other possible explanations the authors consider “nervous disturbances of the terminal vascular bed” as most likely cause of the bleeding in this particular localization.

**PICK**


A review of the various cardiac sounds (or tones) is made. It is suggested that the two most common sounds be called first and second sound complex and that both be classified as systolic sounds. The third and fourth (auricular) sound should be called diastolic sounds. A systematic study of the diastolic sounds was made. In about eight per cent of the cases, additional vibrations were found following the diastolic sounds; these were in early diastole, presystole, or both.

The cases having additional vibrations were broken down by age groups and by etiologic groups: (a) The early diastolic vibrations were more frequent between 10 and 29; they were present in some normal adolescents but were more frequent in various types of heart disease. (b) The presystolic vibrations were more frequent between 10 and 19, and again in the old-age groups; they were found only in heart disease.

The various factors responsible for the diastolic sounds in general and for the additional vibrations in particular are discussed. It is postulated that, in the majority of cases, a slightly asynchronous rapid passive filling of the ventricles is responsible for the double third sound; a slightly asynchronous contraction of the auricles, for the double fourth (auricular) sound.

Knowledge of these possible additional sounds is essential for the exact interpretation of diastolic vibrations in the phonocardigrams and the differential diagnosis between mitral stenosis and other types of heart disease.

**LUISADA**

**PHYSIOLOGY**


A series of open-chest experiments was made in order to study the mechanism of production of the first heart sound under the following conditions: (a) in the empty heart; (b) after ligation of the A-V groove; (c) after extensive damage of the A-V valves; (d) after the ligation of the large arteries; and (e) after necrosis of the ventricular walls.
Phonocardiograms were recorded together with tracings of either the cardiac volume or the left ventricular pressure. The experiments did not allow the separation of the vibrations arising in the valves from those arising in the cardiac muscle, since it was impossible to alter ventricular pressure without changing the force of closure of the A-V valves, or to damage the A-V valves without altering ventricular pressure.

Studies were performed on normal human subjects by recording the low-frequency (apical cardiograms) and the high-frequency vibrations (phonocardiograms) of the chest wall, and on normal dogs and rabbits by recording left ventricular pressure and phonocardiograms. They confirmed the existence of two groups of vibrations within the first sound. These two groups of vibrations coincide with the two main valvular events of early systole (closing of the A-V valves and opening of the semilunar valves) and with two distinct waves in the low-frequency tracing of the chest (apex cardiogram).

It is suggested that the first sound is the result of a combination of muscular and valvular factors. Sudden changes in muscular tension activate first the A-V valves and then the semilunar valves. This rapid succession causes a double vibration of the cardiac wall and is further transmitted to the chest wall, including high-pitched (sound tracing) and low-pitched (cardiogram) components. Although simultaneous with the action of the valves, these vibrations are likely to arise in both the valvular and the muscular structures as a response to rapid changes in tension and pressure. Smaller vibrations, possibly of muscular origin, may be seen at times between the two main groups of vibrations of the first sound. Vascular vibrations occur only later, after the beginning of ejection, and have a lower pitch and lesser amplitude.

Luisada


In the systemic circulation there is an increased peripheral resistance when the diastolic pressure is elevated. This is a report on a study of such relationships within the pulmonary circulation. Catheterization of the heart and determination of cardiac outputs by the direct Fick method were performed in a group of 54 patients with miscellaneous heart and lung diseases. A significant correlation was found between the pulmonary arteriolar resistance and the systolic, diastolic, and mean pulmonary artery pressure. However, the correlation of arteriolar resistance with diastolic pressure was no closer than with the mean or systolic pressures. It would appear that a rise in pulmonary arteriolar resistance increases the pulmonary artery pressure, and this increase is as great or greater in the mean or systolic pressures than in the diastolic.

There was a significant negative correlation between arteriolar resistance and arterial oxygen saturation. The pulmonary "capillary" pressure was significantly correlated with the pulmonary artery diastolic pressure.

The authors conclude that there was no evidence that an increased arteriolar resistance produced a disproportionate elevation in pulmonary diastolic pressure as compared to mean or systolic pressures.

Waife

RHEUMATIC FEVER


The author hypothesizes, based on guinea-pig experiments, that the oxidation of ascorbic acid is associated with desensitization and that cabbage contains an —SH compound which prevents oxidation. Cortisone antagonizes this cabbage effect and permits ascorbic-acid oxidation to occur once more.

From these hypotheses, he argues that dehydroascorbic acid should prove clinically effective in man in the treatment of rheumatic fever. He warns that this substance resembles aloxan chemically and may be diabetogenic. Only further work will prove these hypotheses.

Bernstein


The authors studied 40 rheumatic families in order to investigate the possible importance of heredity in rheumatic fever. The results of this study seem to confirm Wilson's conclusions. According to the authors, transmission of a rheumatic heredity by a recessive gene should be considered as proved.

Luisada

ROENTGENOLOGY


In this study, the roentgenograms of the chest of 6,579 persons over 15 years of age, made in mobile units using 70 mm. film, were examined with a view to determining the incidence of an abnormal cardiac shadow and correlating this finding with other methods of examination of the cardiovascular system. Thus, an abnormality of the heart was noted in 87 of the roentgenograms. Subsequent examinations of the 87 persons indicated that 19 had heart disease which was previously unknown, 26 had cardiovascular disease which was previously known, and 25 were found to be free of organic heart disease. Most
of the cases of rheumatic disease were previously known, whereas more than half the cases of hypertensive arteriosclerotic heart disease were discovered for the first time through the chest roentgen-ray survey. These findings compare favorably with the productivity of the survey from the point of view of tuberculosis case-finding.

WENDKOS


The authors discuss the findings and applications of translumbar arteriography performed in more than 300 instances. The technic of the procedure is briefly described and the normal arteriogram described and illustrated. The findings in renal anomalies, cysts and tumors of the kidney, other abdominal tumors, hydrenephrosis, pyelonephritis, arterial aneurysm and thrombosis, and pregnancy are given, and the value of the method in each of these conditions is discussed.

The amount of circulation in the kidneys can readily be estimated, permitting pertinent deduction as to whether the affected kidney need be removed. Among many patients studied for possible renal origin of hypertension, no instance of the Goldblatt kidney was encountered, though the authors cite a reference in which obstruction of the main renal artery with demonstrable collateral circulation was shown in a patient with hypertension, and this was believed to be cause and effect. The diagnosis of renal infarction was made in four instances and proved at operation in one and by autopsy in the other three. Abdominal aortic aneurysm and splenic artery aneurysm were each demonstrated once; abdominal aortic thrombosis occurred in one instance.

The authors conclude that translumbar arteriography is a relatively simple and safe procedure, and that it offers valuable information not obtainable by any other means.

SCHWEDEL

SURGERY IN HEART AND VASCULAR SYSTEM


A sternal deformity is described in which the depressed body of the sternum displaced the heart to the left, producing symptoms. The angulation of the sternum was a double one, with an anterior bowing in the superior portion, in addition to the usual concavity inferiorly. The complaints consisted of attacks of palpitation followed by slowing of the heart and heavy breathing.

Resection of small segments of five costal cartilages on each side, division of the xiphisternal joint, and transverse osteotomies of the sternum at each of the levels of angulation relieved the symptoms.

ABRAMSON


A method is described of occluding the pulmonary circulation in dogs so as to permit the performance of pulmonary valvulotomy under direct vision. The pulmonary artery and right ventricular outflow tract were closed off with clamps, and a longitudinal incision was made in the pulmonary artery. The valve cusps were then cut through the opening, using a bayonet forceps. A Potts ductus clamp was applied to the incision in the pulmonary artery and the two occluding clamps were removed. Following this the incision was closed with a double row of sutures. Of the 10 dogs operated on in this manner, eight survived. It was believed that the maximum time that the circulation could be arrested without causing death was between three and one-half and five minutes. The clinical implications of such an operation were discussed.

ABRAMSON


An experimental study in which valve-bearing segments of a dog’s aorta were grafted to recipient dogs was undertaken. Since plastic valvular prostheses had been unsatisfactory, the authors felt that aortic valve homografts might be more successful. Valve-bearing segments of aorta were implanted in the thoracic aorta of recipient dogs. The circulation in the distal aorta was interrupted no more than five minutes, and paralysis of the hind limb did not result. Care was taken to be sure that the valve segment had the correct relationship to the direction of blood flow. This was performed in 27 dogs, and seven of these animals survived from one to six months, at which time they were sacrificed.

Inspection of the valves in the animals which died early revealed that they were capable of function and were competent when water was injected in a retrograde fashion against them. Valves that were in place for longer periods were shriveled and thrombosed and were not functional. In segments which had been implanted for 12 months, no valve cusp was identifiable. The authors concluded that this method of valve grafting offered no promise of success as far as function was concerned.

The problem was then approached by studying the effect of a need for function on the survival of these valve homografts. Aortic insufficiency was produced in dogs by incising the posterior aortic cusp with a transventricular valvulotome. Then
ABSTRACTS

THERMOEMBOLIC PHENOMENA


A case is reported of a 41 year old male with arteriosclerotic and hypertensive heart disease whose initial electrocardiogram showed no evidence of myocardial infarction. Following an acute episode of precordial pain, the tracing revealed typical changes of recent anterior and posterior infarction. The patient died soon after this record was obtained. Autopsy revealed multiple coronary embolization originating in a pre-existent partially occluding thrombus of the main branch of the left coronary artery.

Schlesinger


Two cases are reported of acute massive venous occlusion in the lower extremity. The clinical manifestations of this condition consist of a rapid onset of severe pain in the inguinal region and upper portion of the leg, extending downward into the leg, associated with the appearance of a marked degree of pitting edema of the entire lower extremity up to the groin. These changes are followed by blue discoloration which begins in the foot and leg and then gradually proceeds upward onto the thigh. Arterial pulsation may or may not be present in the involved limb. The process may progress to gangrene depending upon the amount of venous involvement. This change results from circulatory arrest caused by blockage of the venous return from the extremity. Arterial blood cannot reach the tissues due to the extreme venous pressure built up in the involved extremity by the extensive venous occlusion.

The treatment of the condition consists of the sucking out of the clots from the major venous channels of the thigh. Sympathetic blocks do not alleviate or correct the clinical manifestations.

Abramson

VASCULAR DISEASE


The authors describe the technic for translumbar aortographic examination and state it can be performed without great risk to the patient. They report in detail four cases which were studied by this technic and diagnosed as thrombotic occlusion of the aorta. The value of making an accurate diagnosis in occlusion of the aorta is extremely important.

Abramson
to the welfare of the patient because it affects the therapy which is instituted. A positive diagnosis between coarctation of the aorta, abdominal aneurysm, and thrombotic obliteration of the aorta can be established by translumbar aortographic examination. In addition the exact location of the lesion can be identified. This procedure does not carry any undue risk when used in patients with aortic disease.

KITCHELL


The author discusses the indications and contra-indications for the use of lumbar sympathectomy in the treatment of ischemia of the lower extremities. Necrosis proximal to the toes, extensive visceral disease, advanced atrophy of the skin and subcutaneous tissue, and severe rest pain negate the use of such a procedure, since these conditions represent advanced states of the occlusive arterial disorder. Peripheral ischemia associated with a cold moist foot, intermittent claudication with palpable popliteal pulses, superficial necrosis of the toes with demonstrable vasospasm, and peripheral ischemia that responds to a sympathetic block are states in which sympathectomy is indicated.

ABRAMSON


A case of multiple arteriovenous fistulas of the right lung is reported. The diagnosis was first made in 1943 at which time the patient, a 24 year old male, was experiencing frequent nosebleeds. Cyanosis and clubbing of the fingers were present, while roentgenograms of the chest showed two lobulated opaque areas, one in each lung field. A left pneumonectomy was performed and the patient's condition improved.

In 1949 fluoroscopy revealed a new lesion in the lower right lung field, associated with the return of symptoms. The patient was again operated upon, and three separate arteriovenous fistulas were found in the right lung. Parts of the right lung were resected. The patient was discharged from the hospital in fairly good condition after a stormy postoperative course.

ABRAMSON


The authors discuss the clinical, diagnostic and therapeutic aspects in 11 patients with arteriovenous fistulas between the internal carotid artery and the cavernous sinus. In the seven cases due to trauma, the onset of symptoms was insidious with unilateral pulsating exophthalmos, involvement of the second, third, fourth or sixth cranial nerves, and intracranial bruit. Chemosis and subcutaneous hemorrhages were common. In the four cases with spontaneous fistula formation, the onset was acute with headache, vomiting, and bruit, while the exophthalmos generally appeared later.

Arteriography in the postero-anterior and lateral views was considered essential. Treatment was more satisfactory in the traumatic group. One case responded to daily digital compression of the common carotid artery; the others required ligation of the common carotid artery, the internal carotid artery, the intracranial portion of the internal carotid or a combination of two or all of these procedures.

The authors believe that the collateral supply comes from the opposite common carotid artery rather than from homolateral external carotid branches.

SCHWEDEL

OTHER SUBJECTS


The important consideration in flight is the oxygen supply of the myocardium which depends upon the coronary circulation and upon the oxygen saturation of the blood. Above 15,000 feet, oxygen saturation falls off rapidly, so that no amount of coronary dilatation could provide a sufficient oxygen supply for the myocardium. Therefore, above 10,000 feet, additional oxygen must be available for any person with heart disease. Whether an individual patient should be transported by air or not depends upon his condition, the altitude to be flown, the availability of oxygen, and the qualifications of the flight attendant. In general, however, a patient who can be transported at all can be flown below 10,000 feet, since oxygen saturation of blood remains satisfactory below this level and since experience indicates that patients with coronary deficits, valvular heart disease, and cardiac arrhythmias will tolerate flights made below 10,000 feet without the development of symptoms referable to the heart.

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ABSTRACTS

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