BACTERIAL ENDOCARDITIS


Since very little is known of the effectiveness of the newer antibiotics in the treatment of bacterial endocarditis, the authors determined the minimal inhibiting concentration of eight antibiotics for eleven strains of alpha streptococci (Streptococcus viridans), two strains of Group D streptococci, and three strains of staphylococci recovered from cases of subacute bacterial endocarditis. The antibiotics used were penicillin, streptomycin, Aureomycin, chloramphenicol, Terramycin, neomycin, bacitracin and polymyxin.

Eleven strains of Streptococcus viridans not belonging to Group D were highly susceptible to the action of penicillin. The minimal inhibiting concentration of penicillin ranged from 0.006 to 0.06 micrograms per cubic centimeter. Aureomycin, Terramycin, bacitracin and streptomycin were slightly less effective. There was considerable strain variation in susceptibility to streptomycin and neomycin. Chloramphenicol was less effective and polymyxin entirely ineffectual.

Two strains of Group D streptococci proved resistant to penicillin, Aureomycin, Terramycin, chloramphenicol, neomycin and polymyxin. They were fairly sensitive to bacitracin and streptomycin.

Three strains of Staphylococcus aureus were susceptible to streptomycin, Aureomycin, Terramycin and bacitracin. They were resistant to chloramphenicol and polymyxin. There were strain differences in reaction to penicillin and neomycin.

MINTZ


Two cases of subacute bacterial endocarditis occurring in rheumatic hearts and caused by a coagulase-negative Staphylococcus albus are presented. Pericarditis was a striking feature, being produced in both cases by multiple areas of focal embolic infarction of the myocardium.

Despite apparent improvement under penicillin therapy, both patients died after a remarkably similar clinical course. The presence of pericarditis and pericardial effusion calls for comment because pericardial symptoms and signs are uncommon in endocarditis due to Streptococcus viridans. The degree of myocardial damage was sufficiently extensive to be the cause of death.

BERNSTEIN


A case of acute bacterial endocarditis due to penicillin-resistant staphylococci was treated with combined aureomycin and chloramphenicol. During the course of treatment many severe side reactions occurred, including mucosal changes in the mouth and gastrointestinal tract, skin lesions and peripheral neuritis suggestive of avitaminosis B, as well
as a complicating fungus infection of the skin. Vitamin administration was only partially effective until the antibiotics were discontinued after bacteriologic cure was certain. The conclusion that the disturbances were attributable to the antibiotics appeared warranted from the course of events in this case, and from similar experiences in the literature. The mechanism is obscure but may be related to the destruction of intestinal bacteria essential for production or utilization of vitamin B, or possibly to a direct competitive blocking effect on intracellular metabolism producing changes similar to vitamin deficiency.

**Ensberg**

**CONGENITAL ANOMALIES**


The authors report 2 cases in one family of Kartagener's triad (situs inversus, bronchiectasis, sinusitis). One had an anomalous left subclavian artery. They indicate that in the literature bronchiectasis is present in roughly 20 per cent of cases of situs inversus. The diagnosis of anomalous left subclavian artery was made in the left anterior oblique position wherein the barium filled esophagus was indent from behind above the level of the aortic knob. A similar small indentation was present in the right anterior oblique view. Since the two patients were brother and sister, both presented the triad; one had in addition another congenital anomaly (aberrant left subclavian artery), and both patients coughed persistently from early infancy. It is fair to assume that the entire triad is congenital in origin.

**Schwedel**


A case of isolated pulmonary stenosis in an 11 year old patient is described. Cardiac catheterization revealed the usual physiologic criteria for this diagnosis—an elevated systolic pressure in the right ventricle of a pulmonary systolic pressure that is markedly lower than the right ventricular systolic pressure. From their studies the authors conclude that patients with pulmonary stenosis may maintain an adequate cardiac output at rest and with ordinary activity. The simple relationship pressure gradient (mm. Hg)/cardiac output (L.)/stenotic index can be considered an approximate numerical expression of the dynamic significance of the pulmonary stenosis. The dilatation of and the high diastolic pressure in the pulmonary arteries in the majority of the catheterized cases are associated with intrinsic changes of the pulmonary artery which can be recognized by angiocardiography. The pulmonary diastolic hypertension may be caused by maldevelopment of the whole pulmonary tree, consisting of a decrease in the total number of medium sized and smaller branches of the pulmonary artery. Dyspnea and cyanosis occur only during temporary or ultimate heart failure. Relative inadequacy of the circulation during stress manifests itself by less dramatic symptoms such as easy fatigability.

**Harris**


Two cases of aberrant insertion of pulmonic veins are described, both in young adult males, who were asymptomatic in regard to the cardiovascular system, but in whom cardiac murmurs were present. Both patients showed electrocardiographic evidence of right ventricular hypertrophy, with an RR' complex over V1 and V2, and radiologic evidence of enlargement of the right ventricle with prominent pulmonic arteries. On conventional roentgenography, one patient showed a curvilinear density in the right lower lung field parallel to the cardiac border, which did not pulsate. Angiocardiography revealed this to be the right lower lobe pulmonic vein aberrantly inserting into the inferior vena cava, and associated with an interatrial septal defect. The other patient showed symmetric widening of the superior mediastinum by sharply demarcated, laterally convex, homogeneous and pulsatile structures. Angiocardiography identified the right side of this density as dilated superior vena cava, and the left side as a wide aberrant pulmonary vein, from the left upper lobe, which joined the left innominate vein. In addition, the presence of an interatrial septal defect was confirmed by cardiac catheterization.

**Corbell**


The differential diagnosis of congenital lesions associated with radiographic prominence of the pulmonary artery segment include interatrial septal defect, patent ductus arteriosus, Eisenmenger's complex, idiopathic dilatation of the pulmonary artery, and isolated pulmonic stenosis with poststenotic dilatation. The authors add to this interventricular septal defect with dilatation of the pulmonary artery, and present the case of a 43 year old boy, in whom the diagnosis of this entity was made. He presented the characteristic murmur and thrill of an interventricular septal defect, but the fluoroscopic findings of a prominent pulmonary artery segment, the appearance of right ventricular enlargement, and increased pulmonary vascular markings were more consistent with the presence of an interatrial septal defect. Cardiac catheterization revealed pres-
ABSTRACTS

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pressures in the right ventricle at the upper limit of normal, and a higher oxygen content in right ven-
tricular samples as compared with blood from the right atrium, indicating a shunt of oxygenated blood into the right ventricle. Angiocardiography revealed dilatation of the right atrium and the right ventricle, dilatation of the main pulmonary artery, but normal pulmonary artery branches, and a somewhat dilated left ventricle. The aorta and left atrium were normal. These two studies confirm the presence of interventricular septal defect with dilated pulmo-
nary artery.

Cortell

Megibow, R. S., and Feitelberg, S.: Further Experi-
ences with Microplethysmography in the Study of Congenital Heart Disease. J. Mt. Sinai Hosp. 17: 303 (Jan.–Feb.), 1951.

The microplethysmogram is a graphic time curve of the digital volume fluctuations, which for prac-
tical purposes are considered to represent a summation of constant phasic and aphasis changes in digital blood volume. The volume pulse wave is a positive biphasic pulsation characterized normally by an abrupt vertical upward deflection, the systolic limb, and a more oblique downward deflection, the diastolic limb, the latter splintered normally about its midpoint by a tiny deflection, the dicrotic notch, occasioned by closure of the semilunar valves.

Forty-six patients in whom the diagnosis of patent ductus arteriosus was confirmed by cardiac catheter-
ization, by angiocardiography, or by thoracotomy showed microplethysmographic changes indicating patency, namely, a flat, obtuse, or rounded apex, the absence of a distinct dicrotic notch, the loss of the normal difference in the gradient between the systolic and diastolic limbs, and variations in volume pulse amplitude. These changes were also noted postoperatively in patients who had the Blalock-Taussig operation.

One patient who showed the microplethysmographic changes of patency was found to have an aneurysm of the sinus of Valsalva which had ruptured into the right ventricle, and another patient, who also showed the characteristic tracing, was found to have an aortic septal defect.

Cortell


The authors report on the case of a 5 year old boy who was cyanotic from 2 months of age, who was markedly underdeveloped, and had a decreased exercise tolerance. The significant diagnostic find-
ings were the presence of left axis deviation in the electrocardiogram, with P1 and P2 tall and peaked, indicating atrial enlargement. A high R wave was present in aV2, and a small R and deep S in aV1.

The presence of left axis deviation in such a child suggested tricuspid atresia, associated with such additional anomalies as to make the defect compatible with life. Conventional roentgenography of the chest revealed a striking absence of the expected lower right cardiac convexity, prominence of the left lower contour, and a normal ascending aorta and aortic knob. Angiocardiography confirmed the clinical impression of tricuspid atresia, a large inter-
atrial septal defect, interventricular septal defect, and diminutive right ventricle. In addition, it estab-
lished the presence of transposition of the great vessels, and suggested the presence of pulmonary stenosis. Since the pulmonary vessels filled poorly, it was felt the patient would benefit from an anastomosis of the left subclavian artery to the left pulmonary artery. This operation was successfully performed with striking increase in exercise tolerance and diminution in cyanosis.

Cortell


The authors point out the diagnostic criteria of uncomplicated pulmonary stenosis, which may be valvular or isolated infundibular stenosis, the former being more common. The patients are usually asymptomatic until the second or third decade, when dyspnea and right-sided congestive failure may supervene. Cyanosis is usually absent and, if present in the absence of congestive failure may mean a physiologically patent foramen ovale. There is a loud harsh systolic murmur, with or without a thrill, loudest in the second, third or fourth left intercostal spaces. The murmur may be transmitted to the neck. The second sound at the pulmonic area may be normal, increased, or decreased in intensity. There is usually x-ray and fluoroscopic evidence of right ventricular enlargement, and sometimes the right atrium may be enlarged. In the majority of cases, poststenotic dilatation of the pulmonary artery is found, which may have increased pul-
sations. The electrocardiograms may be normal, but more often show evidence of right ventricular hypertrophy, and occasionally partial right bundle branch block. Cardiac catheterization shows an elevated right ventricular pressure, a normal or decreased pulmonary arterial pressure, and no evidence of shunt by virtue of normal oxygen saturation values. Angiocardiography is of value in deter-
mining if the stenosis is valvular or infundibular.

Cortell

CONGESTIVE HEART FAILURE

The authors present observations of several cases having angina pectoris which was caused by congestive heart failure. Various factors (such as emotions, exposure to cold, gastric or intestinal reflexes) may provoke the actual onset of pain in these patients. However, the main cause seems to be increased venous return toward the right heart and a failing left ventricle. The combination of increased blood demand caused by increased work and anoxenia leads to coronary insufficiency. Frequently, anginal pain is the first sign of left ventricular failure and appears before nocturnal paroxysmal dyspnea or pulmonary edema. This particular type of angina pectoris is reversible and may disappear completely after treatment of the failure.

LUISADA


The authors review recent researches regarding the sequence of biochemical events in the normal and the failing myocardium. Pyruvate, glucose, lactate, acetate, ketone bodies, fat and amino acids may serve as oxidizable substrate for cardiac muscle. Coenzymes required in many of the oxidative processes are derivatives of vitamin B complex (thiamine, biotin, pantothenic acid, niacin and pyridoxine). It is also possible that vitamin E plays a role in regulating oxidation and phosphorylation. Necessary for the dehydrogenation systems are enzymatic hydrogen carriers including riboflavin and cytochromes. Phosphate bond energy is made available by carrier substances such as creatine and adenylc acid. Szent-Gyorgi's hypothesis of muscle contraction in the heart proposes that the ultimate contractile unit is the actomyosin fibril, a conjugate of polymerized actin and myosin. Depolymerization and shortening of actomyosin causes muscular contraction and the release of energy. This depolymerization is thought to be initiated by the nodal impulse acting on intracellular potassium. In diastole, polymerization of actin is brought about by adenosine triphosphate and myosin. The energy for cardiac work during systole is thus derived from adenosine triphosphate during diastole. This mechanism demands labile phosphate, an adequate supply of which can be maintained only through continuous oxidation of substrate.

Two main types of heart failure may be visualized: (1) disturbances in energy production: (a) oxygen lack, including anoxia and anemia; (b) enzyme or coenzyme lack, the chief example of which is beriberi; (c) hormonal lack or imbalance, such as thyrotoxicosis. (2) Disturbances in energy utilization, as indicated by studies of patients with congestive failure due to hypertension or valvular disease, in whom coronary blood flow, oxygen extraction and substrate utilization are not impaired. In this latter group digitalis generally results in marked clinical improvement, whereas in the high-output failure group in which oxidative metabolism or phosphate bond conservation is impaired the drug causes little or no clinical improvement. It appears that the primary action of digitalis may be to improve the ability of the actomyosin fibril to utilize available phosphate bond energy and thereby increase cardiac work without comparable change in oxygen consumption.

Enselberg


The cation exchanger used in this study was a carboxylic resin in the hydrogen cycle. It is a very fine whitish powder of a sandy consistency without any unpleasant odor or taste, being an almost completely insoluble substance, and having the property of retarding absorption of sodium, calcium and potassium, but permitting absorption of phosphates and chlorides. The end result is therefore similar to the effect obtained from ingestion of ammonium chloride but the advantage of the resin is its control of sodium absorption even though the patient eats a fairly normal diet free from the monotony of extreme sodium restriction. It was administered to a total of 7 cases exhibiting the various manifestations of congestive heart failure. However, because of its bulk, gastrointestinal distress, or its unpalatability, the resin was rejected by 4 of the patients and its effectiveness in these cases could not be evaluated. In the other 3 cases, it appeared to provide considerable benefit. In one case, it was effective in diminishing the frequency of abdominal paracenteses for ascites; in another case, it was responsible for the maintenance of the dry weight even with reduced frequency of administration of mercurial diuretics. In a third case, elimination of edema and ascites was not accomplished in spite of the usual treatment of congestive heart failure over a long period of time, until treatment with the resin was begun. In the absence of marked impairment of renal function, the resin appears to be relatively nontoxic in the doses used.

Wendros

CORONARY ARTERY DISEASE, MYOCARDIAL INFARCTION


The authors report a series of cases of recent myocardial infarction resulting from syphilitic coronary ostial stenosis. In 5 cases there was minimal or absent coronary arteriosclerosis, and in 2 cases, there was an associated moderate to severe coronary arteriosclerosis without occlusion distal to the stenosed ostia. Clinical features of this syndrome in-
clude (1) persistent and prolonged anginal pain, (2) physical signs of aortic valvular insufficiency, (3) positive serology, (4) past history of syphilitic infection, (5) dyspnea, and (6) sudden death. Electrocardiograms were recorded in 2 cases and showed left ventricular strain. Although ostial stenosis is common in syphilis (24 per cent) myocardial infarction due to syphilitic ostial stenosis is rare. The authors believe that since syphilitic ostial stenosis is a slowly progressive process, adequate collateral circulation develops. When persistent angina pectoris develops, however, it has the same ominous significance as stenosing coronary arteriosclerosis.

**Hellerstein**


Clinical experience and statistical tables suggest that coronary heart disease has increased, independent of the aging of the population and improved diagnosis. A sample study of coroners' records suggests that spontaneous rupture of a cardiac ventricle in the elderly is similarly occurring more often. An analysis was made of the necropsy records of the London Hospital, where the coronary arteries as well as the myocardium have been routinely examined since 1907 to 1908. Some 6000 reports from these years to 1949 were studied, relating to both sexes and to ages 30 or 35 to 69, inclusive. These reports show about a sevenfold increase from 1907-1914 to 1944-1949 in the number of cases of coronary heart disease. They suggest that coronary thrombosis and myocardial infarction were rare before the first world war and have since become common, that is, that as a common disease they are new and not merely newly recognized.

An attempt was next made to estimate the prevalence of coronary atheroma in the population from these records. They showed a substantial decrease of advanced coronary atheroma, as defined mainly by the report of calcified lesions in the arteries, between 1908-1913 and 1944-1949. The decrease was seen in all the relevant sex, age and pathologic categories (including hypertensive) studied. It occurred in two phases that seemed to be connected with the two world wars. Some implications of these contrasting trends are discussed, for example, that coronary thrombosis and heart disease may not be simple and direct functions of the atheroma. Possible nutritional relations of the decrease of the atheroma are considered, together with their relevance to the health of an aging population.

**Bernstein**


In 4 patients with calcific aortic stenosis, death occurred following an episode of chest pain simulat-
incidence with age. The accumulated data indicated that coronary artery disease carries a more serious prognosis for men under 40 than for men aged 40 and over.

WENDKOS


The authors describe 3 patients with acute myocardial infarction. Although each of them had gout there had been no acute manifestation for some years. In each case acute gouty symptoms appeared during the period of recovery. In studying the possible factor of derangement of uric acid metabolism, the writers found that myocardial infarction is associated with a sudden fall in the circulating eosinophils with a return to normal after about two weeks. It is mentioned that an acute attack often occurs in gouty individuals after surgical procedures, usually one week after the operation. The patients reported here developed acute gout about one week after the onset of the infarction. A possible allergic response to the products of damaged tissue is mentioned as a possible explanation in both instances. The possibility of a vasomotor factor in the etiology of gout is considered and it is mentioned that there may be a central mechanism involving the hypothalamus.

ROSENBAUM


A follow-up study was performed on 243 patients who had a hypoxemia test during the years 1942 to 1946. The authors found a lower average life expectancy in the male group compared with the female group. In the former the mortality was especially high in cases with a positive hypoxemia test. In cases with a doubtful test the results of the follow-up study were equivocal. A negative test was followed in five instances by cardiac death within six months and, therefore, does not exclude advanced myocardial disease. In a group of hypertensive patients clinical symptoms and signs proved to be a better guide as to degree of coronary involvement and prognosis than the hypoxemia test.

PICK

ELECTROCARDIOGRAPHY


The authors have studied the changes in epicardial and intraventricular leads in acute cor pulmonale produced by mechanical compression of the pulmonary artery. There was an elevation of the RS-T complex in the pulmonary conus, trabeicular zone and right atrial and ventricular cavities, and a depression in the left epicardium and cavities. The increase of right intraventricular pressure produces a partial or total decrease of septal convexity, constituting an “inverted Bernheim.” The “inverted Bernheim” produces an intraseptal block and modifies the septal vectors. The conversion of the rsR of the epicardium of the pulmonary conus to qR is due to the formation of an obtuse angle between the conus and the septum, so that the septal vector goes away from the conus. The RS-T changes likewise are related to changes in the right surface of the interventricular septum. The diagnosis of acute cor pulmonale was made in 40 patients with pulmonary infarction, in 14 patients with pneumonia, and 14 patients with primary or metastatic pulmonary carcinoma. In serial records of the patients with infarction, 37.5 per cent showed no electrocardiographic changes; 15 per cent had the McGinn-White pattern with deep S, Q3; 15 per cent had a shift of AT to the left, of plus 10 to minus 45 degrees, and inversion of T wave in V1 to the transitional zone; 15 per cent had disturbances of rhythm, and the remainder showed right bundle branch block, axis shift to the right, and anterolateral ischemia. The presence of Q in V6 is not a differential sign between acute cor pulmonale and posterior infarction, but reflects changes in the right heart in a horizontal position. Coronary T waves in right precordial leads indicate right ventricular ischemia, and in left precordial leads left ventricular ischemia. Diffuse coronary insufficiency plus distension of the right ventricle with unusual compression on its walls are held responsible for these changes.

HELLERSTEIN


The transition zone of the T wave and QRS complexes was studied in 150 normal electrocardiograms and in 195 tracings exhibiting left, right or combined ventricular strain. In the normals, the transition zone was found between C2 and C3. There was a tendency for a more abrupt transition in electrically vertical and semivertical hearts and for a clockwise shift in vertical hearts. In left ventricular strain, the transition zone was shifted far to the right or left, but was most often located at positions C2 to C4. The T wave was sometimes notched in the region where its direction changed. In right ventricular strain the transition zone was found in several leads, especially in horizontal hearts. In combined ventricular strain a double transition zone was found (leads V1 to V3 and V2 to V3). The location and width of the transition zone were of little diagnostic value as isolated criteria in the interpretation of left or right ventricular strain.

HELLERSTEIN


Intravenous injection of histamine in rabbits, in
a dose of 0.5 mg. per Kg., produced typical shock and significant changes in the electrocardiogram, which showed deep S-T depression in leads I and II and marked S-T elevation in lead III, similar to clinical tracings of myocardial infarction. In addition, disturbances of impulse formation and conduction were seen in the form of premature beats, escapes, and A-V block of various degree. A subcutaneous injection of various antihistamines (2 to 3 mg. per Kg.) protected the animals from histamine shock and the associated electrocardiographic anomalies for about 150 minutes.

**PICK**


In some patients with myocardial disease, bundle branch block appears only at a critical heart rate. The author presents the electrocardiograms of a 47 year old man showing left bundle branch block in the limb leads where the rate was 68 to 80, and normal intraventricular conduction in the chest leads where the rate was 60 to 68. Four days later, QRS complexes in limb and precordial leads showed prolonged intraventricular conduction. The cardiac rate ranged from 71 to 86 beats per minute. The ventricular complexes representing bundle branch block were similar in the two electrocardiograms. Functional changes of fatigue or recovery from fatigue were considered responsible for the fluctuations between normal and delayed intraventricular conduction.

**HELLERSTEIN**


The authors determined in 600 electrocardiograms, obtained on normal individuals of various ages (newborn to 60 years) the position of the Q and S vector in the frontal plane and in space. The Q axis in the frontal plane was shifted to the left (to about –60 degrees) in the newborn and migrated with increasing age to the right to about +120 degrees. The deviation and changes of the S axis occurred in opposite direction (about +150 degrees at birth and –90 degrees in the oldest group). The spatial position of both vectors remained unchanged throughout all ages, the Q vector maintaining a forward inclination and the S vector a backward inclination.

**PICK**


The authors report 5 cases of ventricular aneurysm proved pathologically, one of which was diagnosed electrocardiographically because the tracing was characteristic of anterior myocardial infarction with persistent elevation of the RS-T segment over a two year period. The electrocardiograms in these cases are constantly abnormal with persistent RS-T elevation in the precordial leads. It is felt that the displacement of the RS-T segment may be the result of continuous myocardial injury of the subepicardial or subendocardial ventricular wall.

**KITCHELL**


The authors have repeated the classic iced water experiment of Wilson and Finch and studied the effects on the T wave in unipolar limb and precordial leads and on the ventricular gradient. Primary T wave changes occurred after the ingestion of 800 cc. of iced water in 5 of 6 normal subjects, 4 of 11 patients with left ventricular hypertrophy, 5 of 7 with old anterior myocardial infaracts, and 4 of 7 with old posterior infaracts. The T wave in leads I, aVF, and aVL in the right-sided precordial leads tended to become relatively or absolutely more positive, while in the left posterolateral chest leads and leads II, III and aVF, there was a decreased positivity or increased negativity of the T wave. There was a tendency for the terminus of G in all groups to move counterclockwise toward the first and second sextants, the same region to which G sweeps in posterior wall ischemia. The effective “vector of cooling” of the entire group was located around minus 90 degrees on the triaxial reference system. This localization and the T wave changes support the concept that the iced water ingestion produced a delay of repolarization of the posterior wall of the heart. In control experiments, 800 cc. of tea at body temperature were ingested without significant change.

**HELLERSTEIN**


The authors report on the electrocardiographic tracings taken during cardiac catheterization on 49 patients. Of these, forty-three were from normal patients, and two were from cases of rheumatic endocarditis. Auricular premature contractions were noted in 7 cases, nodal premature systoles in 11 cases, and ventricular extrasystoles in 33 cases, the latter occurring most commonly when the catheter was at the tricuspid orifice, or when it was either at the interventricular septum or being drawn from the pulmonary artery back into the outflow tract. Supraventricular tachycardia was observed in 6 cases, of momentary duration when the catheter was in the auriere. Ventricular tachycardia was observed in 12 cases while the catheter was in the right
ventricle. There was one episode of ventricular flutter with a rate of 240 per minute, which ceased spontaneously in 11 seconds.

One patient with an electrocardiogram typical of a Wolff-Parkinson-White conduction developed an auricular tachycardia while the catheter was passed through the tricuspid valve. Although the catheter was immediately removed, the tachycardia persisted for over two hours, despite intravenous therapy with pronestyl and quinidine lactate. Three hours after intravenous digoxin, the heart returned to regular sinus rhythm with normal conduction. The next day sinus rhythm with Wolff-Parkinson-White conduction was recorded.

Two to one heart block was recorded in one case, S-T segment deviation and T wave changes were seen in 3 cases, all associated with tachycardias. Eight patients developed widening of the QRS complex, probably related to conduction disturbances in the right ventricle.

The authors point out that the aberrant rhythms produced all subsided spontaneously and no irrita-ble discharging ventricular focus ever remained after removal of the catheter.

**Cortell**


The electrocardiographic pattern in multiple chest leads depends on the spatial position of the mean electrical axis. To prove this point the authors present electrocardiograms of a dog, in which the position of the heart within the closed chest was changed by means of threads attached to the apex and pulled through the chest wall in various directions. A shift of the apex to the left produced an increase of the positive deflection in the left-sided chest leads and a shift to the right a similar change in the right-sided leads. Deflection of the axis of the heart in forward direction produced positive deflections in all chest leads and with the apex pulled forward (axis backward) QRS became inverted in all chest leads. The evaluation of the prevalent direction of QRS in the chest leads, associated with determination of the right hand of the frontal plane from the three standard leads, permits a fair estimate of the spatial position of the mean electrical axis of the heart.

**Pick**


The authors present autopsy data on a series of cases with the electrocardiographic pattern of left bundle branch block and distinct Q waves in lead I and/or aVL and the left-sided chest leads. The study of the cases revealed that, contrary to statements in the literature, this type of electrocardiogram does not necessarily indicate the presence of myocardial infarction of the free wall of the left ventricle or massive necrosis of the intraventricular septum. A Q wave in lead I, can, according to the authors, be found in left bundle branch block with positional changes of the heart (respiratory movements, changes in position of the body), in the presence of an additional conduction defect through the right bundle or in pre-excitation of the right ventricle. Pronounced heart failure in hypertension or in aortic lesions with dilatation of left auricle, left ventricle and secondary hypertrophy and dilatation of the right ventricle may also account for the persistence of a Q in left bundle branch block.

**Slapak, L.: The Electrocardiographic Diagnosis of Ventricular Aneurysm. Cardiologia 17: 265, 1950.**

The author reports electrocardiographic findings in 62 cases with ventricular aneurysm which was verified at autopsy in 49 instances (79.03 per cent). The aneurysm was localized in 27 cases around the apex, in 25 cases on the anterior wall, in 7 cases on the posterior wall and 3 cases had two aneurysms. In 54 cases (87.1 per cent) the electrocardiogram showed distinct Q waves and persistence of S-T elevations in the corresponding leads, and in some cases persistent S-T depression in the reciprocal leads. In one case, S-T elevation was present 10+ years after the acute infarction. Five patients showed the pattern of left bundle branch block and in 2 cases the electrocardiogram did not permit definite conclusions because of the presence of multiple infarcts on both anterior and posterior walls.

**ENDOCRINE EFFECTS ON CIRCULATION**


Paper chromatographic and radiosterographic studies after administration of radioactive (I131) iodide to 6 hyperthyroid patients indicate that 97 to 99 per cent of the labeled iodine is protein-bound. Practically all of the labeled organic iodine in the plasma in Graves’ disease was found to exist as a single substance indistinguishable from thyroxine.


Steroidal hormones have been reported to have effects upon cerebral metabolism varying from anesthetic properties and anticonvulsive activity to changes in mood and level of fatigue. Using the
nitrous oxide method, cerebral blood flow and cerebral metabolic studies were performed on 15 human subjects. Administration of desoxycorticosterone glucoside produced a rise in cerebral venous sugar concentration above the arterial level. This indicated to the authors liberation of sugar by the brain. A small but significant rise in the mean arterial glucose concentration might be accounted for by liberation of glucose from other sources, possibly the liver. However, no arteriovenous sugar difference occurred in the peripheral blood, suggesting the absence of an immediate effect of desoxycorticosterone glucoside on glucose metabolism of the muscles of the forearm. The mean arterial blood flow, cardiac rate, and rate of cerebral blood flow were not altered by this steroid.

WAIFE

HYPERTENSION


The authors report results of experiments designed to clarify the mechanism of acute hypertension, which can be produced in the dog by clamping a branch of the pulmonary artery or pulmonary veins. The hypotension was not affected by bilateral section of the vagus nerves, by division of the cervical spinal cord or destruction of the entire thoracic part of the spinal column. The hypotension, however, was reduced following Synamine infiltration of the adventitia of the left pulmonary artery, or by anatomic dissection of the aorta and pulmonary vessels following section of visible rami of the cardiac plexus. The authors feel that "some vascular sensitivity, especially developed in the pulmonary vessels," may account for this particular type of hypotension.

Pick


These experiments support the statement that if enough of a variety of adrenal hormones is given postoperatively to maintain animals made hypertensive before bilateral adrenalectomy, the preadrenalectomy hypotension will be continued at the hypertensive level. “Maintained” is defined in terms of body weight, appetite, and activity. Dehydrocorticosterone acetate and sodium chloride, 11-desoxycorticosterone acetate, and adrenal extract all seem to protect against the postadrenalectomy fall in pressure. Use of DCA was limited by hypoglycemic symptoms after one week. Edema was frequent in hypertensive-adrenalectomized dogs supported by DCA or adrenal extract and sodium chloride. Adrenalectomized-hypertensive dogs required about twice as much adrenal extract as adrenalectomized-normotensive dogs for maintenance. The electrophoretic pattern failed to demonstrate a possible reduction of renin-substrate after adrenalectomy. The globulin fractions of plasma were all increased during adrenal insufficiency. No one fraction showed a consistently greater shift than the others.

OPPENHEIMER


Results obtained with DCA in attempts to elevate blood pressure of rats are variable. This variation depends upon some unexplained factor in the rats. After hypertension is established at 300 mm Hg for a month, vitamin E reduces pressure during the period of its use. After being discontinued pressures again rise. Hypertension induced by a choline-deficient diet appears more rapidly with DCA although the levels reached are no greater. The estrogen estradiol dipropionate, and the antihistamines, Antistine and Pyribenzamine have been shown to be capable of producing hypertension in male rats.

OPPENHEIMER


Adrenal glands are not necessary for the maintenance of salt hypertension (2 per cent sodium chloride substituted for drinking water) for a period of at least four weeks. After adrenalectomy heart size decreases, although blood pressure remains elevated. Salt hypertension rapidly returned to normal when tap water was substituted for 2 per cent sodium chloride within three days in otherwise normal rats. It is concluded that adrenals do not play an important role in the pathogenesis of salt hypertension. The presence of the kidneys is not required for the maintenance of salt hypertension for at least the three days during which the animals survived after bilateral nephrectomy. It is pointed out that these results are consistent with the hypothesis that salt hypertension is dependent on disturbances in fluid distributions which are independent of adrenals and kidneys.

OPPENHEIMER

PATHOLOGIC PHYSIOLOGY


Electrocardiographic proof of ventricular fibrillation is rarely possible and treatment of ventricular asystole by electrical shocks may be dangerous,
since the anticipated ventricular fibrillation may actually be induced by the stimulating current. The presence of ventricular fibrillation may be proved instantaneously, as demonstrated by the author in experiments on rabbits, by observation of the movements of a needle introduced through the chest wall into the ventricular muscle; the same needle may be used for application to the ventricles of defibrillating electrical shocks. Induction of fibrillation by this method was possible only with currents of moderate intensity and if the shock coincided with the phase of partial refractoriness in the cardiac cycle. Shocks of greater intensity effected a coordinate contraction followed by cardiac standstill and irreversible anatomic lesions.

**Pharmacology**


Quinidine lactate (0.65 Gm.) administered intravenously within several minutes produces a maximal cardiac effect, as determined by changes in QT, within 15 minutes. The magnitude of effect is greater than that attained with identical doses administered orally or intramuscularly. However, the toxic effects of quinidine lactate given intravenously make its therapeutic use hazardous.

Pseudoventricular tachycardia occurred in two subjects with auricular flutter following the intravenous administration of 0.65 Gm. of quinidine lactate.

Quinidine lactate (0.65 Gm.) administered intramuscularly is no more toxic than quinidine given orally in similar doses. A maximal cardiac effect in subjects with regular sinus rhythm (normal and abnormal hearts) is attained in about 30 minutes. The duration of peak effect is between two and four hours in subjects with normal hearts and at least six hours in those with abnormal hearts. At 24 hours a small but significant quinidine effect persists.

Observations suggest the following time schedule for intramuscular administration of quinidine: when rapid therapeutic effect is important, hourly administration is indicated; when necessity for speed in therapeutic response is less urgent, administration should be at intervals of three to four hours.

**Bernstein**


Forty-four male albino rabbits were given an injection of horse serum into the cornea overlying the pupil of each eye sufficient to produce a circular opacity of 5 mm. in diameter. Two days later, 40 of these animals were given a single intravenous injection of 10 cc. of sterile horse serum per kilogram of body weight. Twenty of the 40 rabbits received an intramuscular injection of 7.5 mg. (0.3 cc.) of cortisone daily, beginning one day prior to the intravenous injection of the horse serum. The 20 remaining rabbits were used as controls and received 0.3 cc. of physiologic saline solution intramuscularly. On the thirteenth day after the intravenous injection of serum, all of the animals were skin tested for hypersensitivity. On the fifteenth day, blood was taken for precipitin tests for circulating antigen and antibody, and the animals were killed for examination.

There was no striking difference between the skin reactions in the treated and in the control animals. Cortisone did not prevent the development of hypersensitivity and did not inhibit the skin of the sensitized animals from reacting to the injection of the antigen. There was an excessive amount of lipid in the sera of the cortisone-treated animals which necessitated an extraction procedure which lowered the antibody titer. There was a slight tendency for the titers of the cortisone-treated animals to be lower than the controls. There was no parallelism between antibody titer and the development of anaphylactic visceral lesions. The cardiovascular lesions of hypersensitivity (periarteritis nodosa, rheumatic-like cardiac lesions) developed in 17 (85 per cent) of the 20 control animals, and in 4 (20 per cent) of the cortisone-treated animals. Acute diffuse glomerulonephritis with cellular proliferation of the glomerular tufts occurred in 10 (50 per cent) of the control animals. Treatment with cortisone inhibited the proliferative glomerular lesion, but in 15 per cent of the 20 sensitized animals produced a type of severe glomerular damage with accentuated hemorrhage. ACTH, however, inhibits the glomerular proliferation and does not produce the latter type of lesions. The authors, therefore, question the use
of cortisone in the treatment of acute glomerular nephritis.

Margolies


The author finds no evidence of renal toxicity, as indicated by changes in the glomerular filtration rate, glucose Tm and renal paraaminohippurate Tm, in 2 female dogs following the administration of Mercuhydrin and Thiomerin in doses of 1 mg. per Kg. of mercury for five days or after a single dose of either 3 or 5 mg. of mercury per Kg. of either drug. The acute effects of the two mercurials were studied in one dog by determination of filtration rate, renal plasma flow, glucose Tm, and electrolyte excretion for two hours after the intravenous administration of single doses of each drug equivalent to 1, 5, and 10 mg. of mercury per Kg. At the highest dosage level, Thiomerin caused a marked fall in the glucose Tm with subsequent death of the animal despite the administration of BAL which had protected the dog from the same dose of Mercuhydrin. Mercuhydrin caused a greater reduction of glomerular filtration than Thiomerin and a lesser fall in glucose Tm. The author concludes that Thiomerin is more nephrotoxic than Mercuhydrin in large doses.

Sagall


The administration of quinidine sulfate to a patient with heart palpitation led to the development of allergic thrombocytopenic purpura. The fall in blood platelets was attributed to the inhibition of platelet formation by the bone marrow megakaryocytes as well as to increased platelet destruction. The withdrawal of quinidine led to spontaneous recovery.

Harris


Methods of determining thyroid function with radioidine involve the determination of the rate of urinary excretion, uptake by the thyroid gland and incorporation into the “hormonal” iodine of the blood.

The mean urinary excretion in thyrotoxic patients was 25 per cent, with a range of 7 to 45 per cent, and in euthyroid patients the average excretion was 59 per cent, with a range of 23 to 95 per cent. Ninety-one per cent of the euthyroid patients showed an uptake between 10 and 35 per cent. The other 9 per cent had higher values. Ninety-four per cent of hyperthyroids had uptakes greater than 35 per cent. The remaining hyperthyroid patients showed 34 per cent uptake or less. There was a definite overlap between the euthyroid and hyperthyroid groups.

The rate of incorporation of injected radioiodine into plasma protein-bound iodine varies with the degree of thyroid activity; there is no overlapping of the conversion ratios between the hyperthyroid and euthyroid groups. Values range from 13 to 42 per cent in euthyroids and from 45 to 96 per cent in patients with hyperthyroidism. Values of 10 per cent or less are considered to show hypothyroid activity. Patients with hypertension or cardiovascular disease and elevated basal metabolic rates, but no known thyroid malfunction did not show a high conversion ratio.

The results of treatment with radioactive iodine are encouraging. Many years will be required, however, before final evaluation of the possible harmful effects of internal beta radiation to the thyroid and other body tissues can be fully established. A dose of approximately 0.1 millicurie per estimated Gm. of tissue in the gland is given and additional iodine administered as indicated. Hypothyroidism has been the only complication resulting from radioactive iodine administration.

There is a definite correlation between the histologic pattern and the avidity of malignant tumor for radioiodine. All the patients in whom the tumor localized I131 showed varying amounts of glandular formation with colloid, the concentration approximately paralleling the amount of colloid present. Thus, it appears that radioiodine holds some promise for a desirable therapeutic response in the patient whose tumor has a tendency to be differentiated. Since many persons with carcinoma of the thyroid may live many years even with metastases, it will require many years to evaluate fully the results of I131 therapy for thyroid cancer.

Bernstein


The purpose of these experiments was to measure the action of Digilanid on the creatine reserve of normal rat hearts and to compare these results with any effects which might be produced in animals with an altered thyroid state. Digilanid administered to normal rats for 10 days caused a decrease in creatine concentration of about 18 per cent. Following 28 days of Digilanid treatment, the creatine concentration, ventricular weight and total creatine content were found to be within normal limits. Digilanid had no influence on the percentage decrease in creatine produced by thyroxin injections, but did diminish the hypertrophy of the thyrotoxic ventricle and as a consequence increased the relative loss of total
creatine. Although thyroparathyroidectomy elevated the creatine concentration slightly, concomitant cardiac atrophy accounted for an essentially normal total creatine content. The only significant effect of Digilanid in the thyroparathyroidectomized rats was to enhance the cardiac atrophy, thus leading to an actual loss of creatine from the hearts. Therefore, in the animals with altered thyroid function, Digilanid caused an actual decrease in ventricular mass which was reflected in the relative or absolute fall in the total creatine content.

MINTZ


Khellin (Visamin) is a dimethoxy-methyl-furanochromone derived from the plant Ammi visnaga, which grows in the eastern Mediterranean countries. It relaxes visceral smooth muscle by direct effect on the muscle fiber. It has a potent and prolonged coronary vasodilator effect and systemic arteries are said to be less susceptible to its action than the coronary arteries. The authors made observations upon 32 patients for periods ranging from 3 to 10½ months. The studies were controlled by subjective and objective methods, including placebos, exercise tolerance tests and electrocardiographic observations. Twenty-six patients displayed a decrease in the frequency and severity of their angina pectoris; the improvement was marked in 11 patients, moderate in 11 and slight in 4 others. The khellin dosage required ranged from 120 to 240 mg. daily, with an average of 160 mg. The dose required was usually determined by gradually increasing the daily dosage by increments of 40 mg. The ultimate daily dose for maintenance was often less than that needed to initiate improvement. Toxic reactions usually consisted of nausea, vomiting, anorexia or insomnia; none of these were serious but at times they did prevent further increase in daily dosage. The authors conclude that khellin is a safe and effective drug for the treatment of angina pectoris.

ROSENBAUM

PHYSICAL SIGNS


The authors studied 14 patients who were chosen because, in the absence of tricuspid stenosis, a presystolic pulsation was visible or palpable over the liver area; the pulsation was confirmed by liver pulse tracings. Eight cases had congenital heart disease (interatrial septal defect, pulmonic stenosis, Eisenmenger's complex, tetralogy of Fallot); 3 cases had myocarditis with congestive heart failure; and 3 cases had cor pulmonale and failure, chronic auricular flutter and congenital aneurysm of the aortic sinus with perforation into the right atrium. The underlying factor in all the patients studied appeared to be obstruction to right atrial or ventricular outflow due to increased resistance in the right ventricle or pulmonary circuit. This may be common to heart failure, right ventricular hypertension, pericardial effusion, pulmonary hypertension and interatrial or aortic-atrial shunts. The right atrium and the large veins leading to it act as a unit, so that when the right atrium has to contract against an increased resistance, pulse waves are propagated into the liver to produce presystolic pulsations. The presystolic pulsations of the liver were considered to be due to a presystolic pulse wave propagated from the right atrium. The authors state that it is unlikely that 10 to 20 cc. of blood from the right atrium would increase the liver size sufficiently to make it easily perceptible.

HELLERSTEIN


The author emphasizes the relatively high occurrence of tricuspid stenosis. Out of 317 cases with rheumatic heart disease autopsied at the National Heart Institute of Mexico, 146 had evidence of an organic tricuspid insufficiency and 31 of tricuspid insufficiency and stenosis.

The author refers to previous studies proving that the systolic murmur of tricuspid insufficiency can be heard and registered best in inspiratory apnea. Both the opening and the closing snap of the tricuspid valve and a possible diastolic murmur are louder during inspiratory apnea. These facts are explained by the increased right ventricular output during forced inspiration and the following apnea.

LUISADA

PHYSIOLOGY


The red cell volume of 25 normal young men was measured by mixing the subjects' erythrocytes with radioactive chromium (Cr⁵¹) (half-life 26.5 days). The tagged cells were reinjected and the radioactivity of the subjects' red cells subsequently determined. Red cell radioactivity remained constant for about 24 hours. The accuracy of the method was within 5 per cent and was verified by hemorrhage and transfusion experiments. The results with this method agreed within 6 per cent with the radioiron technic.

The average circulating red cell volume was 2351 cc. or 31.8 cc. per Kg. body weight.

From the data obtained in tracer studies with radioactive chloride, Cl\textsuperscript{36}, it was possible to estimate the biologic decay periods of this element for human subjects. A knowledge of the biologic decay rates of chloride in man is of importance in the understanding of the physiologic turnover and exchange rates in normal subjects, in patients with edematous states, including congestive heart failure and in individuals internally contaminated as a result of military and peaceful applications of nuclear energy.

Cl\textsuperscript{36} as NaCl in water was administered to three patients intravenously. One patient was followed for 37 days and 2 patients were studied for 70 continuous days.

The biologic decay periods for Cl\textsuperscript{36} varied considerably, being influenced by the intake of chloride, variations in size of the chloride compartments, state and progress of the congestive heart failure and drugs such as mercurial diuretics, desoxycorticosterone acetate, bromide, sodium and cathartics.

\textit{Mintz}

Wollenberger, A.: Utilization of C\textsuperscript{14}-Labeled Glucose by Cardiac Muscle Treated with a Cardiac Glycoside. Science 113: 64 (Jan.), 1951.

Ouabain was added simultaneously with C\textsuperscript{14}-labeled glucose to slices of dog myocardium. An analysis of oxygen and glucose metabolism revealed that the rate of glucose oxidation was doubled although there was no increase in glucose uptake. It was further found that lactic acid production was greatly reduced by ouabain. The acceleration of cardiac respiration by ouabain is quantitatively accounted for by the increase in the rate of glucose oxidation. It was calculated that the amount of glucose consumed which was converted to lactic acid decreased from 28 per cent to 11 per cent. It is suggested that in cardiac muscle the glycogenolysis accelerates the formation of pyruvate from glucose and lactate.

The author believes that it is unlikely that the stimulation of cardiac energy metabolism by these compounds is the cause of the increase in the force of contraction. More probably, the functional and metabolic changes are both products of a cellular alteration which is still obscure.

\textit{Waife}


The author draws attention to the following experimental facts which appear to be inconsistent with present theories of the mechanics of arterial circulation. In an artificial rhythmic circulation of fluids, increase of resistance at the end of the tube produces a greater increase of the diastolic pressure than of the systolic, the contrary of what is found in clinical cases of hypertension. In an isolated organ or in an isolated artery, rhythmic circulation gives rise to more flow than continuous circulation, even if the pressure of the latter exceeds the systolic pressure of the former. Elasticity of the vessel diminishes the height of its pulsations. If the latter factor would not be compensated by some other factor the arterioles would receive blood without pulsation and the work of the heart would be much increased. It has been demonstrated that the arterial wall plays some part in aiding the propulsion of blood. Deficiency of the arterial wall must, therefore, be considered in the explanation of clinical syndromes like hypertension and shock. Since the coronary arteries produce the same electrical phenomena as other arteries, the role of a functional vascular factor has to be investigated to explain the occurrence of angina in cases without organic coronary disease.

\textit{Pick}

\textbf{RHEUMATIC FEVER}


The authors describe three cases of mitral stenosis in which supranuclear bulbar palsy developed abruptly as the result of bilateral cerebral emboli. One of the patients was a chronic fibrillator, the second had paroxysmal fibrillation and the third had a regular sinus rhythm. All were younger than is usually found when arteriosclerosis produces this condition. Dementia is not a feature of the condition and improvement in these cases was fairly rapid.

\textit{Bernstein}

\textbf{ROENTGENOLOGY}


A technic is described for visualizing of the thoracic aorta by puncture of the vessel through the second left intercostal space and direct injection with radiopaque material. The authors claim excellent results and a minimum of danger, consisting mainly in the possibility of lesion of the internal mammary artery. The method is recommended especially for the differential diagnosis of aneurysms of the aorta and its main branches from other mediastinal masses, for recognition of large arteriovenous aneurysms and of congenital anomalies of the aortic arch.

\textit{Pick}


In two mass miniature radiographic surveys, a
total of 12,713 subjects were x-rayed and 47 cases of cardiac disease were diagnosed radiologically and checked by clinical examination. In survey 1 (11,929 subjects) 17 out of 22 cases of rheumatic heart disease and 7 out of 8 cases of congenital heart disease had previously been diagnosed. There were 14 instances of hypertensive heart disease none of which had been diagnosed before the mass survey. In survey 2 (244 subjects, all women), only 3 cases of cardiac disease were diagnosed radiographically out of a known number of 15 occurring in the group.

It appears therefore that mass miniature radiography is of limited value in the diagnoses of cardiac abnormalities and may reveal some cases of cardiac disease with few or no symptoms. Most cases will be missed because they have not reached the stage where there are radiologic abnormalities.

**BERNSTEIN**

**SURGERY IN HEART AND VASCULAR SYSTEM**


Eleven cases of angiomatous malformations of various types were reported; in each instance exsanguination was carried out. The patients were studied preoperatively using cerebral angiography. This procedure was valuable in making the diagnosis and locating the lesion. The patients ranged between 7 and 34 years of age.

The angiomatous malformations generally consisted of several large arterial trunks entering a central mass of tangled vessels, the angionema. Many large, thin-walled, friable venous channels constituted the outlet.

The authors believe that surgical removal of a cerebral angionema should be seriously entertained if the lesion is accessible and can be removed without profound and permanent impairment, even though the operative risk may be great.

**ABRAMSON**


The authors attempted to emphasize some of the principles involved in the treatment of vascular injuries. It was their impression that whenever possible all severed arteries should be reapproximated to reestablish continuity of lumen. Large hematomas are best treated with immediate incision, ligation of bleeding vessels, and a delayed closure in 5 or 6 days. If left alone or aspirated, such lesions may lead to pseudocyst formation, with infection and necrosis of the overlying skin.

A problem which often causes difficulties in the portion of the extremity below the level of the injury is that of small clots, formed at the site of trauma, being forced into the distal vessel and producing occlusion. Following this the thrombus tends to propagate proximally, with the result that a high thigh amputation may be necessary. In the treatment of such a condition, suggestive evidence has been presented that the artificial production of an arteriovenous shunt, through a side-to-side anastomosis of the artery and vein, and subsequently division and ligation of the proximal venous limb, may be effective in maintaining the viability of the distal portion of the extremity.

**ABRAMSON**


In the author's experience, preganglionic resection of the third and fourth thoracic segments for Raynaud's disease has been disappointing. Most of the patients complained again of blanching followed by blueness and pain following exposure to cold and later to heat. Better results are obtained when the first to the sixth thoracic segments are resected. This is particularly recommended where there are atrophic changes in the fingers. Although primary advanced scleroderma of the hands did not respond well to sympathectomy, if Raynaud's disease has been accompanied by scleroderma of the hands, resection of the sympathetic chain from the first to the fifth thoracic segments gave good results.

In Buerger's disease and arteriosclerotic peripheral vascular disease the presence of a good collateral circulation may indicate sympathectomy. Proof of good collateral circulation are signs such as the absence of marked rubor in dependency and the absence of fast blanching on elevation. Filling of the veins on the dorsum of the foot within 10 seconds in the dependent position after elevation also suggests adequate circulation. Abnormal sweating suggests hyper tonus of the sympathetic system and the likelihood of a good result following sympathectomy. The absence of pulses need not be a contraindication.

Sympathectomy has been effective in relieving 76 per cent of 29 patients with causalgia or reflex sympathetic dystrophy.

**WAIFE**

**VASCULAR DISEASE**


Seventy-five patients with various types of chronic venous pathology of the lower extremity were investigated using an improved method of venography. This consisted of inserting a 19 or 20 gage needle into a dorsal foot vein and firmly fixing it into position with adhesive. The needle was attached to
a 12 inch piece of small-caliber rubber tubing which had on its other end a three-way stopcock. To the free arm of the stopcock was attached an intravenous infusion set containing physiologic saline solution which was used to keep the needle and venous channel patent and to flush the vein free of dye following the injection. A rubber tube tourniquet was placed around the leg just above the malleoli, to obstruct the superficial veins, and a blood pressure cuff was wrapped about the lower part of the thigh and inflated to a pressure of 40 to 50 mm. Hg. The latter step was necessary to obliterate superficial veins at the higher level.

In the normal subject the procedure readily visualized the anterior and posterior tibial veins, the popliteal, superficial femoral, common femoral and external iliac veins. The superficial veins filled above the tourniquet level only when valves to the communicating veins were incompetent. The normal deep veins were found to be smooth and regular in outline.

In patients with a deep venous obstruction, dye could be seen proceeding to this point and by-passing the occlusion by way of collaterals. In cases in which recanalization had occurred, venograms demonstrated the shaggy irregular outline of the vein walls and multiple channels.

On the basis of the method, individualization in the treatment of the postphlebitic extremity was made possible.

**Abramson**


The authors discuss the frequency and gravity of thromboembolism. They state that although prothrombin is essential for the development of clot, the relative proportion of prothrombin and antithrombin is even more important in venous thrombosis. So long as the antithrombin content of plasma is relatively high, venous thrombosis will not occur. Operations of considerable magnitude cause a decrease in the amount of circulating antithrombin beginning the first day postoperatively and continuing for several days. Clotting can, however, be prevented if antithrombin deficiency is corrected by the administration of calcium and alpha tocopherol; the latter acts as an efficient antithrombin. The dosage schedule for both drugs is described.

**Wessler**


The authors in previous studies demonstrated that calcification in coronary arteries is related to changes in elastic tissue and that in such arteries the splitting and fragmenting of the internal elastic lamella is followed by calcification of the fragments. In the current report, this work is extended to the examination of arteries in which atheroma is relatively infrequent, namely the hepatic, the renal and iliac arteries.

It is again shown that calcification which is considered the fundamental aging process in major arteries primarily involves the media, that it originates in an alteration, apparently a degeneration, of the elastic elements, and that it first appears and is most extensive adjacent to the internal elastic lamella, except in the renal artery where calcium deposit is predominant along the external lamella. There is greater deposition of calcium in the iliac artery than in the coronary and renal arteries, and least in the hepatic artery at corresponding age levels.

Calcification following “elastosis” is not specific for the vascular system having been noted in the skin. It is notable in the rabbit and bird as well as in the human. It is not a uniform process, but like atheroma, it is focal. Its development has its initial upsurge in the fifth decade. This work indicates that calcification is independent of intimal plaque formation, but may facilitate the latter. The authors were unable to correlate the intensity of the process with the presence of an obstructive factor. Unfortunately the number of diabetic patients was too small to permit any conclusion.

**Gouley**


A discussion of the etiology, diagnosis, and surgical treatment of various types of injuries to the blood vessels of the extremities was presented by the authors. It was their impression that in the case of complete severance of any artery in the upper extremity, the vessel could be ligated with more or less impunity. However, in the case of a large artery in the lower extremity, such as the femoral above the profunda or the popliteal, it is well to consider some method of restoring continuity, generally by utilizing a vein graft. When it is necessary to ligate a major artery, a concomitant lumbar sympatheticotomy should be performed to insure maximal collateral flow. If laceration instead of complete severance occurs, it is often possible to close the rent by vascular suture, and the patient should then be heparinized for 72 hours.

Traumatic vascular spasm, as results from the impact of some object against the artery or from stretching the vessel, should be treated with vasodilators and paravertebral sympathetic blocks. If these procedures produce no change in the clinical picture, then exploration and possibly arterectomy should be carried out. Exploration may reveal the presence of actual injury and thrombosis of the artery rather than spasm alone.
Delayed traumatic aneurysm in suitable cases should be treated by restoring the continuity of the vessel using a vein graft. If this is not possible, than all means should be utilized to improve the collateral circulation. On the other hand, the most practical way of dealing with an arteriovenous aneurysm is quadruple ligation and excision.

Abramson

The authors present 5 cases of communication between the internal carotid artery and the cavernous sinus, a rare complication of head injury. The fact that the internal carotid artery actually passes directly through the vein, and that in this portion of its course its wall is weaker than elsewhere, predisposes to this type of communication.

When the communication forms, arterial blood pours into the venous sinus, resulting in engorgement of the sinus and reversal of venous flow in the ophthalmic veins and their tributaries. This is followed by congestion of the conjunctival and episcleral vessels, edema of the lids, pulsating ophthalmos, and temporal displacement of the globe in the orbit. If the pressure is sufficiently high or if the intercavernous or basilar sinuses open wide enough, the opposite cavernous sinus may likewise become distended, and pulsating ophthalmos may occur on both sides. Generally there is an increased intraocular tension. The symptoms usually experienced are a bruit heard by the patient, and diplopia. If there is any question regarding the nature of the lesion, an arteriogram may be performed.

The treatment of the communication consists of ligation of the common and external carotid arteries in the neck.

Abramson

A case is reported of a 23 year old Negro man with meningococcemia and meningitis, complicated by gangrene of the left foot, eventually necessitating amputation. Only 11 other similar cases have been found in the literature. Nine of these have been reported since 1944.

An analysis of these reported cases suggests that (a) severe meningococcemia is always present, (b) the recent occurrence of this complication coincides with the advent of antibiotics, (c) it is uninfluenced by sulfonamide and antibiotic treatment and (d) gangrene of the toes and fingers is probably a special instance of the regularly associated gangrene of the skin.

The possible mechanism of this gangrene including arterial and arteriolar spasm, agglutinative or sludging phenomena in the red blood cells, and a direct toxic effect in the vascular endothelial cells going on to inflammation, thrombosis and necrosis, is discussed.

Bernstein

The author states that evidence of accelerated vascular damage in the diabetic patient may precede symptoms of insulin insufficiency and that these vascular changes should be viewed as an associated phenomenon rather than a complication of diabetes. He feels that the course of this vascular damage has not been significantly altered by the use of insulin, diet, level of control, or severity of the disease and appears to be related primarily to the duration of the diabetes.

Wessler

A case of arteriovenous fistula of the lung in a 63 year old patient is presented. An electrokymogram, recorded over the pulsating shadow, revealed large pulsations starting earlier than those of the aortic knob. The extremely early ejection of the right heart was explained by the abnormally low resistance of the pulmonary circulation caused by the shunt. Studies of blood chemistry and hematologie revealed that only 18 per cent of the blood was passing through the shunt. This might explain the good tolerance and the age reached by the patient.

Luisada

OTHER SUBJECTS

The authors have studied the effect of positional changes on the duration of the various phases of the cardiac cycle and the posteroanterior diameter of the heart caused by the assumption of the erect posture. Normal male medical students were studied under basal conditions. The duration of the phases of the cardiac cycle was determined by the electrokymogram and the apparent stroke volume and posteroanterior cardiac diameters by a modification of the technique of Ring and co-workers presented in detail in an appendix. Change from the supine to the vertical posture was associated with shortening of the duration of rapid ejection, total ejection, and total systole, and prolongation of the duration of isometric relaxation and rapid filling. The duration of rapid ejection appeared to be related to the strength of contraction. Reflex stimulation of the cardiac accelerator nerves upon the assumption of the upright posture may account for part of the shortening of
rapid ejection and total ejection. The shortening of the duration of total ejection and total systole upon standing is also related to diminished cycle length, increased strength of contraction, diminished stroke volume, and unknown factors. The duration of rapid filling is an index of the rate of ventricular diastolic filling and is dependent on the atrioventricular pressure gradient. The duration of rapid filling is followed by venous cuffs, after venesection and upon standing. There appears to be no evidence to indicate any active muscular factors which influence the duration of rapid filling. Venesection in the supine position produced a prolongation of the rapid filling phase, similar to that found when the subject was standing, although there was no associated decrease in stroke volume. This indicates that, although the duration of rapid filling is an indication of the rate of ventricular diastolic filling, the minute volume of blood returning to the heart may not necessarily be diminished with a prolongation of rapid filling.

Hellerstein


Pathologic changes in the mediastinal lymph nodes are almost constant findings in autopsies of patients with heart failure. The nodes present alterations which are analogous to changes found in this condition in the pulmonary parenchyma and consist in vacuolar changes (passive congestion), cellular reaction with erythroblastopenia, microhemorrhages especially into small infarcts, hemosiderosis with development of granulation tissue, leading eventually to modification and disappearance of the normal nodular structure. Certain histologic features suggest that these changes are not merely "passive" phenomena, but may develop in successive, brusque and repeated bouts due to active participation of vascular and nervous regulatory mechanisms.

Pick


The authors describe the characteristics of the normal ballistocardiogram. Upward deflections are produced by headward forces; downward deflections by footward forces. The ballistocardiogram may be described as to the regularity and definitiveness of each beat pattern, relative amplitude of the component waves, the variation with respiration, and the constancy of the HK time. The normal pattern is regular from beat to beat except for slight respiratory variations in amplitude. The onset of each normal, complete pattern is definite. Each individual stroke must be studied in its relationship to others.

The afterwaves of the preceding beat are useful to determine where the baseline should be drawn. The normal and abnormal characteristics of the H, I, J, K and HK waves are discussed. Low amplitude of pattern may occur where the cardiac output is low and/or ventricular musculature is weak. Irregularity and indefinitiveness of pattern indicate serious impairment of ventricular function, as may occur with cardiac infarction, failure, pericarditis or myocarditis. Increased respiratory variation occurs with angina pectoris.

Harris


When simultaneous respiration and ballistocardiogram tracings are recorded in a normal subject, the height of the IJ stroke will increase with inspiration and decrease with expiration. The authors present a discussion of the normal variation and certain evidence to show that an abnormal (increased) variation may be associated with a diminution of the pulmonary blood pool. Increased respiratory variations were found in patients with angina pectoris and in hypertensive patients following bilateral dorsal sympathetomy, as well as in patients with emphysema. The decrease in the pulmonary pool could be caused either by increased intrapulmonary pressure on expiration, or by an increase in the peripheral and splanchnic blood pools such as occurs following a bilateral dorsal sympathetomy. In certain cases coronary insufficiency might be secondary to a critically low ventricular output caused by an increased peripheral pooling and a consequent decreased pulmonary pool.

Harris


Fifty-four cases of sickle cell anemia are reviewed. Anemia, pain, fever, and jaundice associated with cardiac murmurs in a Negro patient usually suggested the diagnosis of sickle cell anemia. The presence of direct-reacting serum bilirubin suggested hepatic involvement and enlarged tender livers were frequently found. Roentgenologic examination of 39 patients revealed 27 patients with enlarged hearts. In 9 patients the typical mitral configuration of rheumatic heart disease was observed; the others had generalized heart enlargement or left ventricular enlargement. Significant variations in size of the heart with a return to normal were observed in 3 patients. Mitral systolic murmurs were heard in 20 cases; pulmonic systolic murmurs in 5; aortic systolic murmurs in 2; and mitral diastolic murmurs in 5. The electrocardiogram showed myocardial ischemia in 12 patients. Hematologic studies indicated continued hyperactivity of the bone marrow and a disap-
pearance of the symptoms without persistent elevation of the erythrocyte count. The author condemned the routine administration of blood except in severe cases because of the frequency of blood transfusion reactions and the lack of evidence of prolonged benefit to the total circulating erythrocyte count.

HARRIS


Serum and plasma proteins were studied electrophoretically in 15 cases of sickle cell anemia and in one case of sickle cell trait. Hypoalbuminemia was present in 13, hypergammaglobulinaemia in 12, and elevated beta globulin in 3 cases of the disease. The protein values were normal in the case of sickling trait. Fibrinogen was elevated in 8 of 10 cases.

The authors believe these are nonspecific changes and probably due to the general disease processes with tissue breakdown, particularly in the liver.

WAIFE


In contrast to most reports which have considered disseminated lupus erythematosus to be a diffuse disease of the collagen system occurring almost exclusively in young adult women, the authors found 10 cases in males of a total of 36 seen at the Philadelphia General Hospital since 1936. Five of these in whom there was pathologic confirmation of the diagnosis are presented in detail. These patients illustrated the commonly accepted clinical and pathologic findings of the disease.

SAGALL


A 22 year old female laboratory technician who worked with living toxoplasma parasites, complained of lassitude, headache and fever up to 41 C. A maculopapular exantheme and small tender lymph nodes were found, particularly in the neck. Tests for toxoplasma infection were positive. The electrocardiogram revealed low T waves in the standard leads and in the CF leads in positions 6 and 7. Subternal pain and oppression appeared, and the electrocardiographic changes were progressive. They gradually disappeared after six months, but oppression and shortness of breath on exertion persisted.

SCHERF


The author presents an analysis of the results obtained in 1130 hypoxemia tests, performed on 1103 subjects. Both normal subjects and patients with coronary heart disease breathed a 9 per cent oxygen mixture in nitrogen for 10 minutes while electrocardiograms were taken before, during, and after the test. Of 136 patients in whom the diagnosis of angina pectoris was reasonably certain, only 30.8 per cent showed positive hypoxemia tests according to the criteria of Levy and associates. In patients where no suspicion of coronary artery disease existed, 4.5 per cent showed positive results.

While it is recognized that a negative hypoxemia test does not rule out coronary artery disease, from these results it appears that a positive hypoxemia test does not always mean organic coronary disease, but may be only an expression of functional coronary insufficiency. Among the factors which might modify coronary adequacy are the oxygenation of the blood flowing in the coronary vessels, the diameter of the arteries, and the functional state of the myocardium. The latter is influenced by neurogenic and humoral regulation.

The relatively low percentage of positive tests in the group with angina pectoris is a result of the rigid selection of patients, excluding those with congestive heart failure, and those with previous electrocardiograms showing changes due to an infarction or marked “coronary insufficiency.”

Apart from one case which showed a typical vasovagal syndrome (fall of blood pressure, pallor, and sweating) who promptly recovered after therapy, only occasional minor disturbances such as headache and palpitation were noted. No serious disturbances resulted from this test. The authors believe this is due to the criteria for the selection of patients and to the promptness with which the test was interrupted at the first appearance of such reaction.

WAIFFE


The volume of the heart is determined by radiography and a modified Kahlstrof formula. Erythrocytes labelled with radioactive phosphorus are injected intravenously and the activity of the red cells of arterial blood samples, drawn at fixed intervals, is determined. Dilution curves are obtained. In cases of dilatation of the heart the dilution curves are changed because the labelled cells have to mix with the increased amount of residual blood and they appear with delay in the arteries.

The author concludes that there is probably a small amount of residual blood even in the healthy. The amount of residual blood increases markedly in patients with cardiac dilatation.

SCHERF
ABSTRACTS

Circulation. 1951;4:437-454
doi: 10.1161/01.CIR.4.3.437

Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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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/4/3/437.citation

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