ABSTRACTS OF CARDIOLOGY


The effect on the electrocardiogram of experimental distension of the biliary tract was investigated in 26 patients undergoing surgery of the biliary tract. Sterile normal saline solution was introduced under pressure through a cannula into the gall-bladder or through a rubber T-tube into the common bile duct; the maximum pressure used was 100 cm. of water. Twenty-two of the patients had chronic cholecystitis, 3 had previously had cholecystectomy, and I had a carcinoma of the head of the pancreas with chronic cholecystitis and choledolithiasis. In 14 patients gall-bladder distension and electrocardiographic studies were carried out simultaneously during operation. Of a second group of 13 patients the common bile duct was distended in 12 and the gall-bladder in 1 patient, without medication or anesthesia, 10 or more days after operation. No patient had angina or myocardial infarction and in none did distension of the common duct or gall-bladder cause anginal pain. All patients who experienced pain during distension of the common duct or gall-bladder complained of respiratory distress during distension and in the majority the blood pressure rose. No constant cardiographic changes were found as a result of the distension; control records obtained before operation included abnormal as well as normal tracings. It is concluded that changes in the electrocardiogram in patients with biliary tract disease are variable and may be coincidental, and that it is not justifiable to speak of improvement of the cardiac condition as a result of biliary surgery on the basis of a single pre-operative and post-operative cardiogram, since serial tracing may show instability of the cardiographic pattern, especially of the T waves. A. Schott


Records in 80 male patients without evidence of organic heart disease were taken in the supine position, after standing for 1, 5, and 15 minutes, and again immediately upon resuming the supine position. To investigate the part played by the sympathetic nervous system 0.5 mg. of dihydroergotamine ("DHE 45") was given intravenously to 12 patients and records were again taken supine and erect when the drug effect was at its height. In 25 (31%) there were significant changes in the electrocardiogram on standing, but neither the kind nor the time of appearance of changes were uniform. In 4 temporary A-V rhythm was observed as a result of change of posture. In 11 out of 12 changes occurring immediately on standing could not be prevented by dihydroergotamine. It is concluded that the immediate and delayed changes in the cardiogram must be ascribed to different mechanisms. The former are due to the change of position of the heart and altered contact between the heart and neighbouring structures, the latter to the sympathetic nervous system acting on the heart directly or through the coronary arteries. A. Schott


In a heart that is damaged failure may be caused by sudden rapid rate. Most hearts in which ventricular tachycardia develops have been previously damaged by coronary disease or digitalis. A ventricular tachycardia is recognized by abnormally broad QRS complexes in the electrocardiogram along with an independent atrial rhythm.

Twenty patients with ventricular tachycardia are reported of whom 14 had coronary disease with or without infarction. The others had rheumatic heart disease, except for 2 in whom no organic disease could be found. Nine of the 20 were receiving digitalis at the onset of the attack. In 10 the heart rhythm reverted to normal on quinidine. Quinidine by mouth in a single oral dose produces a maximum concentration in the heart in about an hour, being eliminated in 8 hours. The largest dose used was a total of 5 to 2 g. in 24 hours. The method of Hepburn and Rykert of intravenous dosage is useful, 3 to 5 g. of quinidine sulphate in 500 ml. of 5% glucose intravenously at 100 ml. per hour. Once normal rhythm has been restored, quinidine should be continued by mouth for several days or weeks, the dosage being adjusted to prevent premature ventricular contractions. Morphine intravenously has also been used successfully, 10 to 40 mg., repeated after half an hour to 2 hours. Intravenous magnesium sulphate has also been used successfully. The prognosis is that of the underlying cardiac disease. In some cases achievement of a normal rhythm may not in itself prevent a fatal outcome. J. McMichael


The importance of a low salt intake in controlling oedema is now widely recognized. It has even been shown that, provided the salt intake is low, large amounts
of fluid may be taken without increasing cardiac edema. Schemm carried this principle to the point of recommending a very high daily fluid intake with a diet low in sodium and yielding a neutral or acid ash residue. Thirty patients were admitted to hospital for trial of this regime. Failure to maintain a steady state of edema during a control period led to the elimination of 21 patients from later analysis. In only 9 were the data satisfactory. The regime alone was without beneficial action. Five of the patients were quite unable to consume the large amounts of water recommended. Moreover, the diet was not liked by the majority of patients. After an adequate trial of the Schemm treatment, the condition in 7 patients was found to be much improved on a regime of restricted salt, limited fluid and frequent administration of mercurial diuretics. Analysing critically the charts in Schemm's papers, the authors do not think that diuresis was achieved on his regime. The only occasions on which the patients lost weight were when mercurials were given.

J. McMichael


To facilitate the diagnosis of aortic stenosis the authors studied the clinical and pathological records of 107 post-mortem examinations, in which aortic stenosis with calcium deposits had been demonstrated in the absence of any other valve lesion.

The ages of the patients varied from 10 to 80 years, maximum incidence seventh and eighth decades, ratio males to females 3 to 1. A history of acute rheumatic fever was obtained in two-thirds. Thirty-four patients had chronic congestive failure, 10 had intermittent bouts of failure, and 19 gave a history of an abrupt onset of failure shortly before admission. Cardiac pain was present in only 9 and syncope in 4. The pulse rate was accelerated. Blood pressure was not characteristic. On auscultation the aortic second sound was usually absent or diminished, a systolic murmur was heard at the base in 85% with transmission to the neck in less than half. Basal diastolic murmurs were heard in one-third of the cases. Similar systolic and diastolic murmurs were heard at the apex. Basal thrills were felt in 33 cases, and though usually related in intensity to the degree of stenosis they were absent in several severe cases. Congestive failure was unusually refractive to treatment and was associated with much sweating. Cardiac pain differed from typical angina pectoris in its lack of radiation or portions. It was more closely associated with severe aortic stenosis than with coronary arteriosclerosis. Death occurred suddenly in 21% of patients, usually after 5 to 30 minutes, in contradistinction to the instant death in some cases of myocardial infarction. Coronary arteriosclerosis was common and was associated with myocardial infarction in an appreciable number of cases. Arteriosclerosis was common in the abdominal and descending aorta but not in the ascending.

The condition was diagnosed clinically in only 24% of cases, signifying too great an acceptance of the classical triad of basal systolic murmur, thrill, and small, slowly-rising pulse.

W. T. Cooke


In order to assess the importance in rheumatic children of a loud blowing systolic murmur in the absence of demonstrable cardiac enlargement a comparison was made of the after-history of 144 children having such a murmur with that of 171 similar patients with potential and possible heart disease but with not more than a soft systolic murmur. The average follow-up period was 8 years (5 to 19 years). Those with the loud blowing murmurs were more susceptible to rheumatic fever as judged by the incidence of recurrences (63% had multiple attacks) than were the group with only potential rheumatic heart disease (31% had multiple attacks). Sixty-nine (48%) of those with "mitral insufficiency" developed organic heart disease, and 13 died of rheumatic infection and 7 of bacterial endocarditis. Only 22 (13%) of the patients with potential rheumatic heart disease developed it and none died.

These observations suggest that the diagnosis of mitral insufficiency, based on a loud blowing apical systolic murmur, is justified in children and carries a grave prognostic significance.

H. E. Holling


Several methods of study were used in this investigation. Red blood cells labelled with radioactive phosphorus were injected into moribund patients shortly before death. At necropsy the heart was removed and the distribution of the radioactive cells was quantitatively determined by the Geiger counter and radio-autographs. Five hearts were studied, 2 normal and 3 from patients with myocardial infarction who died 4 days, 12 days, and 8 weeks after the onset of the attacks. Despite certain criticisms that may be advanced against these observations, the authors conclude that in arteriosclerotic hearts with myocardial infarction in living man there is a functioning collateral circulation which allows blood to enter all parts of a myocardial infarction, including the central portions.

Red cells labelled with radioactive phosphorus were injected into dogs at varying times after ligation of the anterior descending branch of the left coronary artery. At various intervals thereafter the hearts were stopped suddenly by freezing. The distribution of the radioactive cells was quantitatively determined. These observations lead the authors to conclude that: (a) Blood from collateral channels supplies the entire mass of ischaemic myocardium distal to a ligated coronary artery. (b) The ischaemic right ventricular myocardium supplied by the ligated artery is better nourished by collateral blood than is a similar portion of the left
ventricle. (c) The sub-epicardial portion of the ischemic myocardium is better nourished than the sub-endocardial region. (d) The anastomotic blood continues to enter the ischemic myocardium for at least 30 minutes after coronary artery occlusion. (e) The collateral blood supply to the ischemic myocardium is an actively circulating one which supplies the entire ischemic region.

The observations are thought to explain in man: (a) the rarity of infarction of the right ventricle; (b) the greater infarction of the sub-endocardial than of the sub-epicardial muscle; (c) the fact that infarcts are generally smaller than the mass of muscle supplied by the occluded vessel.

R. T. Grant


In a series of dogs the blood supply to nerves was interfered with in various ways—by ligation of the nutrient arteries, by stripping off the perineurium, by compressing and stretching the nerve, and by injecting air or particulate matter into the arteries. The degree of ischemia was assessed by the results of inter-arterial injections of dye. The interference with blood supply was found to alter the function and structure of the nerves. Clinical studies in man showed that the blood supply to peripheral nerves may be reduced by similar processes in a number of conditions. Sensory and motor changes are closely related with the ischemia of the nerves. A reflex arc for explaining referred pain on the basis of neural ischemia is proposed.

R. T. Grant


The authors report clinical and necropsy findings in 150 unselected elderly subjects, observed for periods of from a few days to 20 years. The maximum number of blood-pressure estimations on any patient was 57, the minimum 1. Blood pressure, taken during routine medical visits, was classified as: normal (150/90 mm. Hg.); systolic hypertension (over 150/90 or under); systolic and diastolic hypertension (over 150/over 90). On this basis patients were placed in 4 main groups: (1) (a) normal, 12%; (b) mainly normal, occasional variations, 11%; (2) (a) every systolic reading raised, with every diastolic reading normal, 13%; (b) most systolic readings raised, with most diastolics normal, 26%; (3) (a) both pressures raised (except terminally), 17%; (b) occasional variations of this, 11%; (4) the remaining 9% in whom readings were variable. One-third of all males had evidence of coronary occlusion. In females the incidence was much lower. Arteriosclerosis of the aorta was present in all groups, but most severe in (2). Renal arteriosclerosis was most marked in group (3). Cerebral accidents became commoner as blood pressure rose.

Necropsy showed that peripheral resistance increases with age, and this factor, with decreased aortic elasticity, gives rise to systolic hypertension, which may, however, really be a modified systolic-diastolic hypertension. Pure systolic hypertension occurs when decrease in aortic elasticity is greater than increase in peripheral resistance. The authors stress the need for consideration of cardiac, cerebral, and renal function before a blood pressure level is taken as indicative of cardiovascular disease; a "normal" blood pressure in old age is produced by interaction of the above variables, and does not afford evidence of normality.

Morag L. Inlay


Heart disease is a common and serious complication of pregnancy. There was an incidence of 0.8% in 29,713 patients attending Queen Charlotte's Maternity Hospital from 1937 to 1946 inclusive, with a mortality of 3%. In the series reviewed 11% of the maternal deaths were due to heart disease.

Pregnancy increases the work of the heart to such an extent that a damaged heart may be unable to bear the extra strain. The most valuable single method of assessing cardiac function in these cases is by determining the response to the routine of daily life. The classification adopted by the New York Heart Association is recommended: Group 1: no limitation of normal active life. Group 2: slight limitation, producing breathlessness at the end of effort. Group 3: definite limitation necessitating resting two or three times while climbing stairs. Group 4: heart failure at rest. Auricular fibrillation is a most serious complication; in the series reviewed, of 7 patients with fibrillation 3 died. Once decompensation occurs in pregnancy the chance of its recurring in subsequent pregnancy is great, and termination requires consideration. This is also advised for Group 4 patients and those in Group 3 who in the early months fail to respond to medical treatment. This consists of maximum rest, with at least 2 hours in the afternoon and 12 at night. Weekly examinations are advised throughout pregnancy. Intercurrent infection should be treated seriously, and admission to hospital for a week of observation at the twenty-eighth week is advised, and again for the week preceding delivery. Vaginal delivery is the method of choice with adequate sedatives and forceps in the second stage. In Group 4 no obstetrical treatment should be attempted until the patient is thoroughly rested and digitalized.

Cesarean section was performed on 21 patients in this group, but its role in patients with heart disease is strictly limited, as for example in heart disease with associated disproportion. The need for sterilization should not be used as an argument in its favour.

In these 225 patients with heart disease, 124 were suffering from mitral stenosis, 23 had an associated aortic incompetence and 13 had congenital lesions, of which the most serious was coarctation. In such cases pregnancy should be avoided, but if it does occur Cesarean section is advised as the method of delivery.

The avoidance of infection in the puerperium and the
importance of adequate rest are stressed; breast-feeding was not permitted in Group 3 and 4 patients. As most of the fatalities occurred in the puerperium the difficulty of giving a prognosis in the early stage of pregnancy is mentioned. Patients may easily pass from one group to the other during the course of pregnancy or labour, but the prognosis has greatly improved with better antenatal and intra-partum care. J. Stallworthy


The authors state that their object in this study was to seek electrocardiographic peculiarities, other than those usually described, that might be of value in diagnosis. One of the authors believed that he had observed, in a previous study of the cardiogram in diseases of the left side of the heart, progressive changes leading to a left bundle-branch block. It was therefore possible that similar changes might be found in disease affecting chiefly the right side of the heart.

Serial studies of the electrocardiograms of 100 patients and of the size of the heart show that the cardiographic changes and increase in the size of the heart appear simultaneously during the progress of the disease. Retardation of the impulse to the right ventricle is held to be decisive for the cardiographic development. The retardation may cease in the stage with low R, or may progress until a maximal right ventricular retardation curve appears, ending with right bundle-branch block. The latter occurs in the same proportion of cases as does left bundle-branch block in left heart disease. Donald Hall


This communication deals with the application of the oximeter to measurements of oxygen saturation of the blood. The oximeter used was that described by Millikan in 1942 and fitted with a photo-electric colorimeter. The oxygen saturation of the blood is measured directly by fitting the apparatus on to the human ear. The first study was concerned with the oxygen saturation of the blood in 25 patients with congenital cardiac defects of the cyanotic group; 19 healthy subjects served as controls. Readings of oxygen saturation of arterial blood were taken and the effects of breathing 100% oxygen, change of posture, and exercise were particularly noted.

With the patients breathing pure oxygen the arterial saturation increased by from 2 to 16 points %, while in the normal controls this was only increased by from 1 to 5 points. The effect of walking less than 2 miles an hour diminished the arterial oxygen saturation by from 3-5 to 19 points % in the patients while the maximum in the normals was only 2 points %.

Interesting data are given on 1 patient with the tetralogy of Fallot, who, when exercised on the treadmill for 5 minutes at 1-7 miles per hour, showed a fall of arterial oxygen saturation from 80% to about 50%; in a normal subject in the same circumstances the oxygen saturation increased slightly.

The second part of the paper deals with the determination of arterial oxygen saturation at rest and during exercise in 8 cyanotic patients. This was done both by the Van Slyke method and by oximeter readings. The results were then compared and it was found that the average decrease in saturation on exercise was 19-5% by the Van Slyke method, while the simultaneous oximeter readings indicated a 13-3% decrease. Thus the discrepancies are large, but, as the authors say, "the instrument is still of considerable value in estimating the degree of disability of a patient and in judging the efficacy of corrective surgical procedures in such patients." Suitable data are given in support of these statements. A. I. Suchett-Kaye


Analyses of electrokymograms indicate that, in normal subjects, asynchronous ventricular ejection is more frequent than synchronous ejection. In patients with left bundle-branch block ejection from the right heart and in patients with right bundle-branch block ejection from the left heart precedes that of the opposite side by a significantly longer time than in normal subjects. R. T. Grant


High spinal anesthesia caused no significant changes in renal plasma flow and glomerular filtration rates in 11 cases of chronic congestive heart failure. The ischemia with vasoconstriction associated with this condition cannot be attributed, therefore, to neurogenic stimulation following a fall in cardiac output. E. F. McCarthy


In 10 cases of the tetralogy of Fallot the arterial oxygen was estimated by a recording oximeter before, during, and after operation for the establishment of a systemic-pulmonary arterial shunt. The chief findings were that: (1) a rise in arterial oxygen saturation occurs practically immediately on the establishment of the shunt; (2) as a result of the operation the saturation time upon administration of 100% oxygen is greatly shortened. R. T. Grant