

ABSTRACTS OF CARDIOLOGY

Cardiovascular Catheterization as an Aid in Diagnosis of Abnormal Cardiovascular Communications. A. J. GEIGER, H. C. ANDERSON, A. W. WINKLER, and H. S. KAPLAN. *Con. Med. J.*, 10, 895-899, Nov., 1946.

These authors have applied cardiovascular catheterization to the study of cases of suspected arteriovenous shunts and cardiac septal defects. In their interesting paper they give a preliminary account of the procedure in 16 patients. Their method is that used by Courmand and Ranges since 1941 in the United States. Detailed results obtained by this investigation in 5 cases of suspected abnormal cardiovascular communications are given.

The intracardiac catheterization permits: (1) direct visualization of the septal defect when the tube passes through the defective septum and into the left heart chambers and their vessels; (2) localized injections of contrast media, such as "diodrast" in 70% concentration injected with utmost speed and in volumes of 20 to 40 ml.; (3) direct-pressure measurements which will give evidence of the shunt through transmission of the relatively high systemic blood pressure to the pulmonary artery or the right ventricle; and (4) removal of blood for gas-content analyses, especially estimation of the oxygen content in samples of blood collected from the respective right heart chambers and vessels. In cases of interauricular septal defects the diagnosis is unequivocally established by the finding of considerably oxygenated blood in the right auricle and the passage of the catheter into the right inferior pulmonary vein by way of the left auricle (Case 3).

According to the authors, cardiovascular catheterization is a fairly simple and quite safe procedure which can be conveniently performed even in an out-patient department. Except for an occasional local venous thrombosis in the catheterized arm, no untoward effect has resulted. No murmurs were heard on auscultation when the catheter had passed through the tricuspid and pulmonary openings. Attention is drawn to an occasional failure to demonstrate relatively arterialized blood in the presence of a small septal defect; this happens because: (1) a small quantity of arterIALIZED blood is shunted, and (2) the tip of the catheter may be situated out of the line of flow of the shunted blood.

A. I. Suchecki

Primary Pulmonary Hypertension. J. R. GILMOUR and W. EVANS. *J. Path. Bact.*, 58, 687-697, Oct., 1946.

Clinical observation in a case of cardiac failure had suggested the diagnosis of pulmonary hypertension, and this was confirmed at necropsy. A woman of 44 had suffered for 2 years from intense fatigue, dyspnoea on slight exertion, and œdema, and had responded to

treatment with rest, digitalis, and mercurial diuretics. Diagnoses of hypertensive heart failure and of pericardial disease, respectively, had been made at the 2 hospitals to which the patient had been admitted previously, but the skiagram and the electrocardiogram pointed to a pulmonary-vascular origin of the condition, the first showing enlargement of the right auricle, of the conus of the right ventricle, and of the pulmonary artery, and the latter right ventricular preponderance with an inversion of the T wave in leads II and III and CR₁. Although the patient appeared to be responding well to treatment, she died suddenly.

At the post-mortem examination there was evidence of congestion in lungs, liver, spleen, and kidneys; there were hypertrophy and dilatation of the right ventricle, dilatation of the right auricle, and adherent thrombi in the right auricular appendage, with slight atheroma in the aorta and "many small flecks of atheroma in pulmonary artery and its branches". The histological examination of the pulmonary vessels showed in numerous sections aplasia or hypoplasia of the media of many vessels, together with intimal changes resembling those of systemic hypertension in these areas, so that stenosis or occlusion of these vessels resulted. The deficiency of the media in numerous vessels throughout the lungs was, in the opinion of the authors, the basis for the development of the endarteritis, which occurred as a reaction to transient hypertension, such as might have been produced by coughing, and thus started a vicious circle which made the hypertension permanent.

B. Samet

Parenteral Vitamin B as Agent for Determining the Arm-to-Tongue Circulation Time. Part I. R. E. SWENSON. *Amer. Heart J.*, 32, 612-616, Nov., 1946.

A commercial preparation of the vitamin-B complex is used to measure the arm-to-tongue circulation time, 5 ml. of the preparation being injected intravenously through a No. 20 needle; the end-point is given by a sudden, intense, and unique taste sensation. A duplicate determination can be made within a few seconds of the first one and no untoward complications have occurred.

H. E. Holling

Tachycardia due to Venous Hypertension in Man. (A Study of the Bainbridge Reflex.) La tachycardie créée par l'hypertension veineuse chez l'homme. (Étude du réflexe de Bainbridge.) J. LEQUIME, M. SEGERS, and H. DENOLIN. *Acta cardiol.*, 1, 1-13, 1946.

The authors present the results of the following experiments in support of the hypothesis that an

increased venous pressure leads to a rise of pulse rate (Bainbridge reflex) in man, and that this is mediated by the vagus nerve. In the course of the investigations a proportion of the subjects showed an increased respiratory rate when the venous pressure was raised—an effect similar to that observed by Harrison in animals. It is emphasized that the Bainbridge reflex cannot completely account for the cardiac acceleration after exercise.

Eleven subjects were infused with 1 litre of warmed serum over a period of 5 to 10 minutes. The venous pressure was found to rise 12 to 24 mm. of water. Electrocardiographic records taken over the same period showed an increased pulse rate of 8 to 25%. After 4 subjects were given 2 mg. of atropine intravenously the pulse quickened and the venous pressure fell. Infusions were then administered as before without influencing the heart rate, though the venous pressure rose above resting levels. (During the course of all these investigations there was no change of blood pressure as measured by a Pachon oscillometer.) In a case of femoral arteriovenous aneurysm, compression of the anastomosis gave a fall of venous pressure and pulse rate and a rise of arterial pressure as measured directly by a cannula in the opposite femoral artery. These changes were suppressed after the administration of 1.5 mg. of atropine intravenously. The respiratory rate was observed to increase after infusion in 8 of the 11 subjects. (The vital capacity remained constant.) This effect was not observed when atropine was administered first. It was not seen in the arteriovenous aneurysm. The possibility that some of these effects might be due to transfusion reactions, or to pharmacological substances in the serum used, is not discussed.

W. J. H. Butterfield

Hypertension and Calcium Intake. C. M. KESSON and A. McCUTCHEON. *Lancet*, 2, 793, Nov. 30, 1946.

The authors, in the Stobhill Hospital, Glasgow, have studied a group of 80 patients over the age of 40 years to see whether any correlation exists between osteoporosis and arteriosclerosis. In 30 there was evidence of osteoporosis, and in these the blood pressures were similar to those of the control cases, while arteriosclerosis and arterial calcification were present equally in the two groups. In subsequent investigations which entailed a daily calcium intake of 1.6 g. for periods of 6 to 15 months no hypertension developed and arterial calcification did not progress. It is concluded that, contrary to the claim of Harris, a high-calcium diet over many months has no effect on the development of arteriosclerosis.

R. Bodley Scott

Clinical Aspect of Polyarteritis Nodosa. H. G. MILLER and R. DALEY. *Quart. J. Med.*, 15, 255–283, Oct., 1946.

Though more cases of polyarteritis nodosa than formerly are now being recognized before death, a large proportion are still missed. The authors believe

that the difficulty of diagnosis during life is only in part inherent in the behaviour of the disease, and that in many cases it is due either to failure to consider the diagnosis in a difficult case or to rejection of the diagnosis, once considered, because of the absence of one or more signs, such as subcutaneous nodules or eosinophilia, which are considered typical but are actually of infrequent occurrence.

To clarify the clinical picture, so far as is possible in a condition of such protean manifestations, the more important past writings are reviewed and 9 new cases are recorded.

R. T. Grant

Dissecting Aneurysm of the Aorta. (A Study of a Series of Fourteen Cases.) J. D. PALMER and A. K. MATHISEN. *Canad. med. Ass. J.*, 55, 585–595, Dec., 1946.

Ante-mortem diagnosis of dissecting aneurysm of the aorta is difficult. The patient usually dies of rupture of the aneurysm with a massive hæmorrhage, but occasionally he may survive and organization and obliteration of the sac or rupture back into the lumen may occur with formation of a double-barrelled aorta. The incidence in the Royal Victoria Hospital, Montreal, was 1 in 575 necropsies, compared with 1 in 175 reported by Shennan. There were 7 male and 7 female patients, whose average age was 49 years. Onset of symptoms was sudden and occurred when the patient was at rest: severe pain is felt in the præcordial region or upper quadrants of the abdomen, or, if the dissection involves the abdominal aorta, may spread into the lower abdomen, and it later spreads into the back. Pain is intense, sharp, and tearing and may recur. All patients show marked prostration and signs of shock may be present. In 8 cases the blood pressure was high on admission, while in 8 it was low. Temperature was normal on admission, but in those who survived the temperature rose after the first day to 100°–101° F. (37.8°–38.4° C.). White-cell count and erythrocyte sedimentation rate were moderately raised. In most cases the urine contained albumin, hyaline casts, and red cells. In two cases hemiplegia resulted from involvement of the orifice of the innominate or carotid artery. The Wassermann reaction was usually negative, and the chest radiography revealed widening of the arch of the aorta. Electrocardiograms in 10 cases showed the changes of hypertensive heart disease; where previous records were available no change since the incident could be found. In 1 case electrocardiographic changes like those of coronary occlusion appeared on the tenth day, and necropsy disclosed involvement of the coronary arteries by the dissection, and the presence of blood in the thoracic cavity, usually on the left side. In 2 instances there was blood in the pericardium. The ascending and transverse portions of the arch were most commonly affected. The aorta showed medial necrosis and the heart was hypertrophied in all cases except one. It is considered that hypertension was an important factor in the production of the dissection.

J. McMichael

Hypertrophy of the Heart of Unknown Etiology in Young Adults: Report of Four Cases with Autopsies.

R. F. NORRIS and H. H. POTE. *Amer. Heart J.*, 32, 599-611, Nov., 1946.

Death from congestive heart failure occurred in four instances of unexplained cardiac hypertrophy and dilatation. These 4 unusual cases occurred during 1 year at the Philadelphia Naval Hospital, and the victims were all sailors between the ages of 21 and 30 years. The cardiac hypertrophy was in all cases recognized and investigated some time before death, so that the usual causes of the condition had been excluded. It would have been more satisfying, as the authors point out, if glycogen-storage disease could have been excluded. There was, of course, no indication that the aetiology was the same in all 4 cases.

H. E. Holling

Anoxemia and Exercise Tests in the Diagnosis of Coronary Disease.

G. BIÖRCK. *Amer. Heart J.*, 32, 689-696, Dec., 1946.

This contains a discussion of the value of the various tests designed to elicit anginal pain or electrocardiographic changes in patients in whom the diagnosis of coronary artery disease is in doubt. The general conclusion is that such tests are not to be recommended for general use; their application and interpretation require considerable experience and they are liable to provoke unpleasant reactions.

R. T. Grant

Notes on the Similarity of QRS Complex Configurations in the Wolff-Parkinson-White Syndrome.

G. E. BURCH and J. L. KIMBALL. *Amer. Heart J.*, 32, 560-570, Nov., 1946.

From a review of the literature the authors conclude that the various configurations of the QRS complex seen in the electrocardiograms of cases of Wolff-Parkinson-White syndrome may be classified into 5 types. The criteria employed in diagnosis were: (1) a short P-R interval and a prolongation of the QRS duration with slurring and notching; (2) absence of any clinical signs of heart disease in most instances; (3) repeated paroxysms of tachycardia; and (4) return of the electrocardiogram to normal on parasympathetic depression and exercise as well as spontaneously. The similarity of types III and IV to left and right bundle-branch block is pointed out, the short P-R interval indicating the correct diagnosis.

The Wolff-Parkinson-White syndrome is due to the existence of an anomalous conducting pathway connecting the auricles to the base of the ventricles. Impulses from the auricles pass down this pathway as well as by way of the auriculo-ventricular node and Purkinje system, but owing to the shorter course of the anomalous pathway the process of ventricular depolarization is initiated earlier in the region around its termination. The site of termination of this pathway is an important factor in the configuration of the electrocardiogram.

B. McArdle

Electrocardiographic Changes occurring during Treatment with Fuadin Solution.

S. B. BEASER and R. RODRIGUEZ-MOLINA. *Amer. Heart J.*, 32, 634-644, Nov., 1946.

The authors report that 20 of 25 cases receiving foudain treatment for infections with *Schistosoma mansoni* showed decrease in the voltage of the T waves of the electrocardiogram. These changes were reversible after 3 or more weeks. It is suggested that the drug affects the myocardium, and that courses of therapy with it should be separated by a similar period to prevent cumulative effects on the myocardium.

W. J. H. Butterfield

Orthostatic Paroxysmal Ventricular Tachycardia.

M. PETERS and S. L. PENNER. *Amer. Heart J.*, 32, 645-652, Nov., 1946.

The authors describe the case of a woman, aged 24 years, who for 1½ years had had frequent attacks of tachycardia occurring only in the upright position, always ending when she lay down, and recurring on standing. Electrocardiograms taken during attacks were characteristic of paroxysmal ventricular tachycardia. The relation to posture was confirmed. The authors review the literature of paroxysmal ventricular tachycardia and suggest that in their cases the attacks were due to unusually strong sympathetic tone.

B. McArdle

The Combined Use of Lanatoside C and Quinidine Sulfate in the Abolition of Established Auricular Flutter.

R. M. TANDOWSKY, J. M. OYSTER, and A. SILVERGLADE. *Amer. Heart J.*, 32, 617-633, Nov., 1946.

Intravenous lanatoside C (a glycoside of digitalis) was found to be more effective than digitalis (especially when given by mouth) in the conversion of established auricular flutter to fibrillation. An initial dose of 1.6 mg. given intravenously was followed by a daily maintenance dosage of 1 mg. Twenty-one cases were treated. Of these, 4 reverted to sinus rhythm within an hour: auricular fibrillation was established in 15 within 2 to 72 hours and in 1 case after 13 days' treatment, while in a thyrotoxic patient (before operation) the rhythm was unchanged. In all but 4, primary slowing of the ventricular rate occurred within an hour. Quinidine sulphate with lanatoside C (1 mg. daily) was given to the 15 patients who developed auricular fibrillation. Owing to intolerance the quinidine was discontinued in 1 case; the remaining 14 reverted to sinus rhythm within 1 to 10 days, but flutter recurred immediately the quinidine was discontinued in 1 case, and in 1 other sinus rhythm was followed by nodal tachycardia and sudden death. Necropsy showed an extensive myocardial infarct. The remaining patients received a maintenance dose of lanatoside C over an average follow-up period of 11 months without recurrence of flutter. Lanatoside C is superior to digitalis leaf because of its rapidity of action when given intravenously and its strong vagal action.

B. McArdle

Electrocardiographic Criteria of Bundle-branch Block and its Location. (Present Position of the Question.) (Les critères électrocardiographiques du bloc de branche et de sa localisation. État actuel de la question.) H. DENOLIN. *Acta cardiol.*, 1, 44-68, 1946.

This is a good review of the literature of bundle-branch block. The author considers that our present criteria for diagnosis of abnormalities of interventricular conduction may prove hazardous, and that the diagnosis of asynchronous contractions of the ventricles may prove particularly so. He points out that the duration of the QRS complex may be prolonged to over 0.1 second in healthy hearts, and the position of the heart in the chest and the electrical conductivity of the tissues adjacent to it may cause aberrations of the ventricular complex. This being so, he would prefer that electrocardiographs showing a QRS deflexion prolonged over 0.1 to 0.12 second and followed by a T wave of opposite polarity should be judged diagnostic of a "disturbance of intraventricular conduction", and that the term "bundle-branch block" should not be used because it presupposes a pathological state of the ventricles which may not be otherwise demonstrable. He points out the need for further study of asynchronous contraction of the ventricles.

H. E. Holling

The Clinical Significance of Certain Changes in the Limb Lead Electrocardiogram in Arterial Hypertension. G. F. FILLEY. *Bull. Johns Hopk. Hosp.*, 79, 261-282, Oct., 1946.

The electrocardiogram of left ventricular strain shows inversion of the T waves in lead I or leads I and II with left axis deviation and high voltage. The significance of this change is still uncertain. The author has analysed the clinical and pathological findings in 100 cases of arterial hypertension with these changes in the electrocardiogram. The electrocardiographic changes become most marked with diastolic pressures over 130 mm. Hg and in the presence of coronary sclerosis. Cases of myocardial infarction were excluded from consideration. When the heart weight is above 500 g. the electrocardiographic change is also pronounced. There was no relation to the predominance of left ventricular over right ventricular hypertrophy as gauged by the ratio of thickness of walls of right and left ventricles or of weights of these chambers.

The electrocardiographic changes in themselves do not indicate a very bad prognosis. The strain pattern reflects primarily the degree of hypertrophy in response to the high diastolic pressure rather than the state of myocardial sufficiency; it does not seem to bear any relation to the duration of the hypertension. The relation of coronary artery disease suggests that the T-wave changes are associated in some way with the myocardial blood supply, and also with hypertrophy. The changes of strain, however, should not be interpreted as unfavourable signs. They are quickly reversed after sympathectomy.

T. McMichael

The Diagnosis and Treatment of Tracheal and Esophageal Obstruction Due to Congenital Vascular Ring. R. H. SWEET, C. W. FINDLAY, and G. C. REYERSBACH. *J. Pediat.*, 30, 1-17, Jan., 1947.

Two cases of this rare congenital defect due to a double aortic arch are reported. The infants developed a persistent cough and inspiratory stridor within two weeks of birth. In the first case, radiological examination of the oesophagus with the aid of barium, when the child was 3½ months old, showed an indentation posteriorly at the level of the aortic arch and, slightly below this, another indentation of the right lateral margin of the oesophagus. Surgical exploration confirmed the diagnosis, and the ductus arteriosus and ventral component of the double aortic arch were ligated and divided. The patient made an uneventful recovery. In the second case radiological examination at the age of 2 years showed a displacement of the superior mediastinum to the right and a narrowing of the trachea at the level of the aortic arch posteriorly and on the right. Two years later, radioscopy with barium showed an oesophageal deformity at the same level. At operation a vessel representing a persistent right fourth aortic arch connecting the ascending and descending aorta was identified, ligated, and divided. The subsequent progress of the child was satisfactory.

Jas. M. Smellie

The Effect of Anticoagulants on the Penicillin Therapy and the Pathologic Lesion of Subacute Bacterial Endocarditis. W. S. PRIEST, J. M. SMITH, and C. J. MCGEE. *New Engl. J. Med.*, 235, 699-706, Nov. 14, 1946.

It has always seemed logical to use anticoagulants in the treatment of subacute bacterial endocarditis in order not only to prevent the formation of fibrin deposits and to make bacteria more accessible to therapeutic agents but also to diminish the frequency of embolism. This communication concerns 34 consecutive cases of bacterial endocarditis treated with penicillin at the Wesley Memorial Hospital, Chicago. Of these, 15 received in addition heparin or dicoumarol, either alone or in combination, and 19 were treated without anticoagulants. In the entire series there were 12 deaths; 8 of the patients had received anticoagulants at some period of their treatment. The authors found that the use of anticoagulants did not always prevent major embolism, and that there was no quantitative difference in the amount of fresh fibrin on the lesions whether anticoagulants had been given or withheld. Heparin proved an expensive treatment, not only from its intrinsic cost but also because of the necessary daily tests of prothrombin time. The important conclusion reached was that, if the daily dose of penicillin is adequate, healing will take place as well without, as with anticoagulants. All 15 of the latest cases recovered with 1,000,000 units or more of penicillin daily. Anticoagulants may have been responsible for fatal hæmorrhage in 2 cases.

James W. Brown

Paroxysmal Hypertension. A. S. ROGEN. *Lancet*, 1, 103, Jan. 18, 1947.

As evidence that paroxysms of hypertension may be caused by a rapidly growing cerebral tumour, even when it does not invade the thalamus or hypothalamic region, the author records the case of a man of 62 with a few weeks' history of epileptiform attacks, whose origin from a right cerebral focus was shown by twitching of the left arm and leg followed by left hemiparesis and aphasia. There had been no significant headache, giddiness, or papilloedema, but the blood pressure had fluctuated between wide limits (260×/140 and 110/70 mm.), the higher reading being associated with his epileptiform attacks, though it was occasionally unrelated to these. Apart from an apparently positive cold pressor test (Hines, *Amer. Heart J.*, 1940, 19, 408) there was no evidence of an adrenal medullary tumour (phaeochromocytoma), though this diagnosis had been seriously enough considered for laparotomy to be contemplated. At necropsy a large glioblastoma was found occupying the right parietal and occipital lobes; this did not encroach on the thalamus or hypothalamus. No adrenal tumour was found.

Henry Cohen

2-Thiouracil in the Treatment of Congestive Heart Failure. E. P. SHARPEY-SCHAFFER. *Brit. med. J.*, 2, 888-889, Dec. 14, 1946.

The theoretical purpose of thyroidectomy in congestive heart failure is to reduce the total oxygen requirements of the body and so decrease the work of the heart. As a means of avoiding the high mortality associated with thyroidectomy in severe cases of cardiac failure the author tried the effect of 1 to 2 g. of 2-thiouracil given over long periods. Detailed results of the treatment of 12 cases are presented.

By means of cardiac catheterization the cardiac output and right auricular pressure were measured, and the work of the heart was calculated arbitrarily from the product of the cardiac output and the blood pressure. Seven cases of low-cardiac-output heart failure (hypertension and valvular heart disease) and 5 cases of high-cardiac-output failure (emphysema) were treated, and, as several had already received a long period of treatment by ordinary methods, spontaneous improvement was considered unlikely. It was found that the basal and resting oxygen consumption were reduced by thiouracil, but it did not follow from this that the cardiac output necessarily fell, as sometimes the arteriovenous oxygen difference decreased with the fall in oxygen consumption. Since the blood pressure sometimes remained unchanged it follows that the work of the heart may be unaffected by thiouracil. Even so, clinical improvement, as judged by a fall in venous pressure and an increase in exercise tolerance, resulted in both groups in the majority of cases. It is pointed out that no benefit can be expected in rapidly deteriorating patients, as thiouracil takes a week or 10 days before its effect on the thyroid is evident.

S. Oram

The Present Status of Penicillin in the Treatment of Subacute Bacterial Endocarditis. H. E. RYKERT. *Canad. med. Ass. J.*, 55, 543-547, Dec., 1946.

Fifteen patients with subacute bacterial endocarditis treated with penicillin in the Toronto General Hospital are reported; in 5 the disease was clinically arrested, 5 died of complications (nephritis, 1; emboli, 3; and congestive failure, 1), but in these the infective process was probably arrested, while in another 5 the treatment failed. In one of the failed cases the cause was probably an insensitive strain of streptococcus, but in the others it was difficult to determine the cause of failure. A daily dose of less than 200,000 units is likely to be inadequate. If the response to this is unsatisfactory (blood cultures remaining positive, fever persisting) the dose should be increased to 500,000 units daily. There is little to be gained by any increase above this dosage. The average duration of the disease in the clinically arrested cases was 8 weeks, compared with 23 weeks in the cases in which the treatment failed. Long duration of the disease leads to deep location of the organisms in the vegetations. Either continuous intramuscular drip or interrupted injections are suitable. J. McMichael

The Esophageal Electrocardiogram in Arrhythmias and Tachycardias. C. BUTTERWORTH and A. C. POINDEXTER. *Amer. Heart J.*, 32, 681-688, Dec., 1946.

This paper emphasizes the value of the oesophageal electrocardiogram in aiding accurate diagnosis in certain cases of tachycardia and arrhythmia. It is of special value in those abnormalities in which the P waves are difficult to identify accurately—as, for example, when the P wave is superimposed on the ventricular complex or when P-wave voltage is low. Illustrative electrocardiograms are given. The construction and use of oesophageal electrodes are briefly described. R. T. Grant

Electrocardiogram in Derangements of the Organism's Water and Electrolyte Metabolism. [In English.] O. J. BROCH. *Acta. med. Scand.*, 126, 157-176, Nov. 9, 1946.

Electrocardiograms were taken on 18 patients with well-marked dehydration or disturbance of acid-base or electrolyte balance. Dehydration (determined clinically or by changes in haemoglobin concentration) was usually associated with a depression of the S-T interval in one or more leads, but there was no correlation between the degree of this depression and the severity of the dehydration. The S-T interval became isoelectric on restoring the fluid balance, but the T waves usually became temporarily flattened or diphasic for 1 to 3 weeks. The author believes that these changes were due to an inadequate coronary blood flow secondary to the dehydration. Potassium chloride given as a 25% solution to 4 cases of renal insufficiency caused a rise in the height of the T waves when these were positive, or a smaller deflection when negative. B. McArdle