ABSTRACTS
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Abstracters

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ATHEROSCLEROSIS


The administration of a single 30-ml. dose of sitosterol (Cytellin) or of 45 ml. daily for periods of 4 to 6 months was found not to change the enteric absorption curve of radioactive triolein in 15 patients with coronary atherosclerosis and an elevated serum cholesterol and in 5 healthy individuals, all on normal diets. Serum cholesterol values in the chronically treated group showed no striking changes.

Rogers


The effect of muscular work on unesterified fatty acids (UFA) in man was studied by determining plasma concentrations in arterial blood and femoral veins at rest and during exercise to the point of exhaustion of the exercising leg. Six healthy subjects were studied. The exercising legs extracted UFA from plasma, and the arterial plasma concentration decreased or remained fairly constant during exercise, increasing again during a resting period of 30 minutes. The method is described in detail. The differences in concentration between the arterial and venous blood indicate that UFA were extracted from the blood perfusing the exercising leg at the different work loads up to the maximal. At rest the arterial and venous hematocrit values were equal, but during exercise they sometimes differed, with the venous values at times 1 to 5 per cent higher than the arterial. In discussing the findings in relation to the energy metabolism of exercising muscular tissues, the authors find support for the theory that UFA is one of the major transport forms for fat needed for immediate energy metabolism and that extraction of UFA during exercise may well be due to the metabolism of fatty acids to yield energy via the Krebs cycle.

Maxwell


The serum cholesterol was compared with the erythrocyte migration time in patients with and without evidence of coronary artery disease. A close correlation was found between the chylomioner and erythrocyte migration times. The erythrocyte migration time was significantly prolonged in subjects with coronary occlusion compared to a control group. No significant difference was found in this study between the cholesterol level of the coronary group and of the control group; no correlation could be demonstrated between serum cholesterol level and erythrocyte migration time. It is concluded that the migration times are a measure of plasma surface activity and the colloidal stability of plasma fat.

Kurland

Cholesterol is synthesized from acetate units in the body and the mechanism of the biosynthesis of cholesterol in a male patient with familial hypercholesteremic xanthomatosis is the basis of this report. C-labeled acetate was administered orally, and the radioactivity in the free and ester fractions of the plasma cholesterol was estimated at intervals for 144 hours. The specific activity of the free cholesterol reached a maximum within 4 hours, fell relatively rapidly between 4 and 24 hours, and then more slowly. The specific activity of the ester fraction increased slowly and became equal to that of the free cholesterol at about 2½ days and reached a maximum in 4 days. The results are interpreted as showing an increased rate of biosynthesis of cholesterol from acetate in this patient.

**Krause**


A method has been devised for producing atherosclerosis in rabbits by feeding a semi-synthetic cholesterol-free diet containing only 8 per cent fat. The cholesterol-free diet without any fat produced a rise in cholesterol and the same aortic changes as in cholesterol-induced atherosclerosis. The effect of various added fats on cholesterol level and aortic atherosclerosis was studied. Milk fat and hydrogenated coconut fat produced hypercholesteremia, and within 3 to 4 months, gross aortic changes. Corn oil and similar oils produced only a small rise in serum cholesterol but no gross aortic lesions. In 1 animal, the fat-free diet was followed by diet with added corn oil; there was a prompt drop in serum cholesterol. This suggests that the hypercholesteremia was due to a deficiency of fatty acids.

**Kurland**

**Valvular Heart Disease**


A 33-year-old man with mitral stenosis developed hemoptysis, which could not be controlled with ordinary measures and which began to reach exsanguinating proportions. Dramatic control of bleeding followed an emergency mitral commissurotomy. The authors believe that this patient represents the first reported case of emergency surgical relief of mitral valve obstruction for the treatment of massive hemoptysis and point out that the operation may be a lifesaving measure in the management of these patients.

**Sagall**


Fifty-six adult patients with mitral stenosis subsequently confirmed at surgery were studied by cardiac catheterizations. The findings were correlated with the prominence of the pulmonary arterial segment on the posterior anterior chest x-ray that was defined in terms of the “PA/chest ratio.” The latter was determined by dividing the pulmonary arterial size (the distance from the midline, as judged by the thoracic spines, to the edge of the pulmonary arterial segment at its widest point in centimeters) by one half the transthoracic diameter (the greatest transverse diameter of the chest from pleura to pleura in centimeters) and multiplying the result by 100. A positive correlation was found between the “PA/chest ratio” and pulmonary arterial mean pressure. The correlation was exponential in character and resembled the shape of the pressure-volume curve. This correlation was poor in patients with left-to-right shunts and increased pulmonary flow, but in patients with mitral stenosis it proved to be a useful guide to the presence or absence of pulmonary vascular disease without the need for employing cardiac catheterization.

**Sagall**


The phonocardiographic data obtained in 20 patients with pulmonic stenosis are discussed. The most important features in distinguishing isolated stenosis from “tetralogy” were as follows. The intensity of the first sound tended to be louder in the pulmonic area. In no case of pulmonic stenosis was there a systolic click. The peak of the systolic murmur was more delayed in respect to the first sound in pure stenosis. A delayed pulmonary component of the second sound was recorded in all patients with pure pulmonic stenosis and in none with tetralogy. The systolic murmur overlapped the aortic component of the second sound in all patients with pulmonic stenosis. An atrial sound was recorded in all patients.
and in half of those with moderate pure stenosis, but in none of those with "tetralogy."

BRACHFIELD


Vectorcardiograms were registered with the method of Schellong in 36 patients with isolated mitral stenosis confirmed by cardiac catheterization and usually also by operative findings. In 19 patients (type A) the QRS loop was vertical and showed clockwise rotation in the frontal plane; the QR section of the loop had about the same area as the RS section, and the O point and the T loop were situated within the QRS loop. The mean pulmonary artery pressure in this group was 28 mm. In all patients (type B) the frontal QRS loop was similar to type A, but the O point was at the periphery of the loop and the QR area much smaller than the RS area; the T loop was at the left boundary of the QRS loop or outside it. The mean pulmonary pressure in this group was always greater than 26 mm. and on the average 55 mm. Hg. Values of 50 to 78 mm. corresponded to T loops pointing upward and to the left. The right ventricle in this group was usually not dilated according to fluoroscopic findings during catheterization. In 5 patients (type C) the QRS loop was deviated considerably to the right and upward and the R section was undulatory or notched. The T loop pointed to the left and upward or downward. The average mean pulmonary pressure in this group was 47 mm. but the right ventricle usually showed considerable dilatation. The vectorcardiogram can accordingly furnish valuable preoperative information concerning hemodynamic findings in mitral stenosis.

LEPESCHKIN


The effects of norepinephrine upon the cardiovascular system in normal subjects were compared with the effects in 8 compensated patients with marked aortic valve regurgitation. Cardiac output, regurgitant flow, and central volume were determined by indicator dye-dilution curves before and during norepinephrine infusions (0.2 mg. per Kg. per minute). Intravascular pressures were recorded from the pulmonary artery and the brachial artery, and a pulmonary capillary tracing was also recorded. The difference in response to the infusion between the 2 groups was most manifest in the pulmonary capillary and pulmonary artery measurements. In the aortic regurgitation group, a nearly 4-fold rise to levels of pulmonary congestion developed, compared to only a 5 mm. Hg mean rise in the normal group. The slight increase in left ventricular filling pressure in the normal group was associated with a sizable stroke work increase, whereas no significant change in contractility was found in the aortic regurgitant group, despite markedly elevated filling pressures. Bradycardia and increased pulmonary arteriolar resistance, present in the normal group, were absent in the diseased group. It is suggested that displacement of blood from the peripheral venous system was the predominant, if not sole, mechanism in the induction of pulmonary congestion and diminished left ventricular performance during norepinephrine infusions. In 4 patients with aortic regurgitation, the application of tourniquets to induce peripheral venous occlusion resulted in a normal increment in pulmonary capillary pressure and a normal stroke work response to the norepinephrine infusion.

Kayden


A 39-year-old man, previously in good health, was treated for 3 years for progressive congestive heart failure. The physical findings were those of combined mitral insufficiency and aortic stenosis with the latter considered the dominant lesion. The clinical diagnosis of aortic stenosis was confirmed by an apical heave, a systolic thrill, and the demonstration of a "diamond-shaped" murmur phonocardiographically. The congestive failure was refractory to treatment and became progressively worse. At autopsy the only cardiac lesion was mitral insufficiency secondary to rupture of the 2 chordae tendineae of undetermined cause. It was postulated that a regurgitant jet effect had produced the phonocardiographically confirmed murmur of aortic stenosis.

SAGALL


Four cases are described in which mitral regurgitation developed following mitral commissurotomy and in whom left cardiac ventriculography confirmed the presence of significant reflux opacification of the left atrium. Subsequently
at surgery these patients were demonstrated to have had an advanced degree of mitral regurgitation. In these patients, 1 of the leaflets of the valve or some of the chordae tendineae had been ruptured. Although the physical findings may be the same, this technic differentiates the mild and innocuous mitral regurgitation that may develop following commissurotomy from the severe cases. Following ventriculography in these patients there is minimal or no opacification of the left atrium. Cardiac ventriculography thus provides a reliable technic for the differentiation of serious grades of mitral regurgitation following mitral commissurotomy from the benign forms of postoperative mitral incompetence.

Sheps

VASCULAR DISEASE


The findings in 33 operated cases of thrombotic occlusion of the aorta and iliac arteries during the period from 1953 through 1957 are reviewed. The symptoms appeared in the middle years of life and were gradually progressive. The majority of patients were men. All had calf claudication, mostly within 1 block; a large majority also had pain in the thigh and hip; impotence, coldness of the feet, leg cramps, and rest pain were also noted. Three patients had heart disease, 2 renal disease, and 2 hypertension. There were no diabetic subjects. Resection and grafting with homographs in most were performed in 82 per cent of the patients; thromboendarterectomy was done in the remainder. In addition to the more definitive procedure lumbar sympathectomy was performed in 60 per cent. One patient developed a hemorrhage and thrombosis at 1 of the iliac anastomoses and required reoperation and regrafting, which finally resulted in gangrene of a toe. In another patient postoperative thrombosis lead to infarction of the kidneys, uremia, and death from a cerebral vascular accident. Another man developed chronic uremia in the postoperative period and died 14 months later of serum hepatitis. One patient sustained a cardiac complication in the postoperative period but survived. There were 3 deaths in the follow-up period apparently unrelated to the surgery or to the aorto-iliac disease. The operative mortality, thus, was 3 per cent and the mortality of the entire group was 15 per cent. Immediately after the operation the majority of the patients had strongly palpable pulses down to and including the ankle. During the follow-up period there was some reduction in the number of palpable pulses, especially distally. In the follow-up period, 37 per cent of 27 patients had no claudication; 3 per cent had some claudication but after greater walking distance than previously; and the remainder had slight or no improvement in walking distance.

Sheps


The authors reviewed the literature of atheromatous embolization to medium and small arteries of various organs of the body and reported the first case of proved atherosclerotic plaque embolism to cutaneous arteries. In this patient, a 60-year-old man with long-standing hypertension and 3 cerebrovascular accidents in the 4 months preceding his hospital admission, spontaneous pain and darkening of the tips of several toes of both feet developed during the week before hospitalization. The progression of patchy peripheral gangrene, despite prolonged conservative treatment, exploration of the left popliteal artery, and nerve blocks, necessitated bilateral above-the-knee amputation. Pathologic examination of the specimens demonstrated embolic occlusion by atheromatous material of otherwise structurally intact subcutaneous arteries. The source of the emboli in this case presumably was the abdominal aorta and the iliofemoral arteries. It is postulated that cutaneous gangrene from such emboli is more likely to occur in the presence of an arterial circulation already impaired by proximal narrowing of a major artery and, therefore, that operative correction of this narrowing might be advisable in therapy.

Sagall


Two procedures, angiography and arterial grafting, have altered the treatment of arterial disease so that now a decision must be made in each patient as to whether or not arterial grafting is indicated. This follow-up study of 500 patients with arteriosclerosis obliterans indicated that about 75 per cent showed little progression of the disease over a 5-year period. All such patients should have benefits of angiographic study to determine the feasibility of arterial grafting. Angiographic morbidity was 0.1 per cent with no deaths. The effect of sympathectomy on progression in these patients was difficult to assess but in the presence of segmental arteriosclerosis arterial grafting was indicated when technically feasible. All patients with arteriosclerosis oblit-
erans should be diagnosed early and advised of the necessity of strict adherence to good hygiene of the feet, protection from trauma, avoidance of extremes of temperature, and abstinence from tobacco.

KITCHELL


The origin and diagnosis of arterial embolism is reviewed. In 86.5 per cent of patients the source of emboli is said to be identifiable. The general management of the patient with acute arterial block includes the treatment of the basic disease, increasing the blood supply to the involved part, and the prevention of further extension of the blood clot already present. All modalities that act to achieve these results are in the medical treatment of these patients and should supplement surgical management in the operated patient. In certain situations, a delayed surgical approach utilizing a retrograde-flush technic might be beneficial. In general, life expectancy following one episode of arterial embolization is reduced to about one half of the normal expectancy because of subsequent emboli. Long-term anticoagulation is therefore indicated. Apparently cardiac atrial appendectomy adds no protection against subsequent embolism. Conversion of atrial fibrillation to sinus rhythm may be of value. The role of fibrinolysis in clot dissolution is still under investigation and when such agents with low toxicity are available, this type of therapy will probably be valuable.

KRAUSE


Two cases are reported in which an aneurysm had ruptured into the duodenum causing death. One patient had multiple episodes of gastrointestinal bleeding for an arteriosclerotic aneurysm of the abdominal aorta that ruptured into the third part of the duodenum. In the other patient, multiple episodes of bleeding into the gastrointestinal tract was caused by a saccular aneurysm of the hepatic artery that ruptured into the first part of the duodenum. The literature is briefly reviewed.

SHEFS


Ruptured intracranial aneurysms were repaired in 23 patients under hypothermia with the aid of temporary vascular clips. The mortality of 11.7 per cent for the entire group of 17 patients under the age of 50 compared favorably with mortality rates for untreated patients and for patients treated by other methods. The author concluded that early intracranial surgery was indicated preferably within 6 days after the presenting symptoms occurred and that satisfactory results could be expected in patients under 50 years of age in good physical condition but that results would be poorer in patients over the age of 50 and in those who were comatose, regardless of their age.

KARPMAN


Two-hundred and seventeen patients with venous ulcer were followed for 10 to 15 years. Sufficient data for evaluation of the results were available in 110 patients who were operated upon. It was found that inspection and palpation of the extremity after the patient had been on his feet for some time was the best method of determining the status of the venous circulation. Tourniquet tests and venograms did not yield any significant information. The major factors in venostasis were noted to be the dilatation tortuous superficial veins and the incompetent communicating veins, the results of postphlebitic processes and primary varicos veins. Proper supportive measures were indispensable in the preparation of the leg for surgery and in prevention of recurrences. The Unna's boot remained the best method of accomplishing this support. The authors have discarded injection of sclerosing solution because, in their experience, it frequently resulted in uncontrolled thrombosis often affecting the deep veins. The surgical procedures used here were (1) limited vein excision with injections, (2) extensive vein excision through horizontal incisions, and (3) extensive vein excision with vertical incisions in the leg. In the first group there were 8 good results in 32 patients. In the second group there were 4 good results in 39 patients. In the third group there were 27 good results in 44 patients. The authors believe that the adoption of a vertical incision in the anteromedial aspect of the leg and at other sites as indicated makes possible a more thorough interruption of incompetent perforating veins and accounts for the better results in the third group. It is emphasized that all of these patients must continue to be observed for development of new incompetent perforating veins and varicosities.

LEVINSION

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The author points out that compression of the subclavian artery may occur at the site of callous formation after a fracture of the first rib as well as in the presence of a cervical rib. Fibrous bands may occasionally compress the artery but this is rare. He believes that the important alteration of physiology occurs in the poststenotic dilated segment of the vessel. This area is frequently the site of thrombus formation from which distal emboli may occur. In treatment, complete excision of the cervical rib as well as the adjoining prominence of the first rib are of paramount importance. In this author's experience, upper thoracic sympathectomy is preferred to excision of the dilated artery segment even if the latter is thrombosed. Where brachial plexus phenomena are found the difficulty is usually due to a short cervical rib with a fibrous band. Where vascular phenomena were not marked the subclavian artery was usually compressed between a cervical rib and a prominence on the first rib. Arteriograms still showed patent digital vessels in spite of ulcerations of fingers, so that diminished blood flow must be postulated instead of distal emboli as a cause for the finger ulcerations.


A case of multiple peripheral emboli from atherosclerosis of the aorta is reported with autopsy findings, and the pertinent literature is reviewed. The authors reemphasized the fact that multiple vascular occlusions of small arteries may occur from emboli broken loose from eroded atheromatous aortic plaques and that significant lesions may appear in the kidneys, brain, heart and extremities. The concomitant presence of a positive serologic test for syphilis or the presence of gout in these patients was believed to be fortuitous.

OTHER SUBJECTS


Experiments in dogs are reported showing that atrial flutter induced either by electrical stimulation of the right atrium or by injection of acoustiue into the atrial muscle disappeared when the inciting agent was eliminated, whereas atrial fibrillation could persist independent of the initiating agency. The independent survival of atrial fibrillation was found only in the presence of adequate cholinergic discharge. The various theories as to the mechanism of atrial fibrillation are discussed in terms of these experiments and it is concluded that irregular activation of the atria may be produced by (1) a single rapidly discharging ectopic focus, whether electrically or chemically induced, (2) multiple rapidly discharging foci, or (3) a rapidly circulating circums movement. It is further concluded that atrial fibrillation may be self-sustained and independent of the initiating agency provided that the atria are large enough (as the adult human atria are) or have a sufficiently brief refractory period.

Sagall


The lymphatic drainage of the lower extremities was studied by cannulation in 65 patients and in 35 dogs. The lymphatic channels were visualized by the injection of radioactive iodinated serum albumin after cannulation. In addition, pressure determinations were made by electronic measurements. Investigations were performed on 25 normal patients and on 40 with various pathologic states, such as chronic edema, burns, chronic ulcerations, varicosities, involvement of lymphatics with infection, and metastatic malignancy. In the dog, the effects of hypoxia, trauma, and simulated altitude were studied. In the normal state the pressure findings were consistently subatmospheric and the channels appeared to be in the nature of potential spaces. Contrary to the usual concept, it was found that lymphatic channels from the foot did not converge to form larger vessels as they moved upward. Great variations were present because of congenital differences. Negative pressure in the lymphatics seemed to increase with motion and massage. In the presence of edema there was an increase in the size of capillary lymphatics. Edema, inflammation, mechanical blockage, and other pathologic states resulted in positive pressure readings. In chronic ulceration the obliteration of superficial lymphatics did not interfere with the lymph flow beneath the lesion unless congenital abnormalities existed. In the dog, lymphatic pressure became positive in the presence of trauma, hypoxia, and simulated increasing altitude. These studies indicate that this cannulation technique offers possibilities as a diagnostic, prognostic, and therapeutic tool, particularly in chronic edema and ulceration of the lower extremity.

Levinson

The heart size in dyspneic premature babies was significantly greater for the first 3 days than in apparently healthy controls, and the decline in heart size by the fifth day was significant. In full-term babies the heart size was greater in the breathless babies in the first 30 hours than in normal subjects. Based on previous data these dyspneic babies also usually are found to have a crescendo systolic murmur and anomalous behavior of the heart rate. It is suggested, therefore, that the dyspnea in these babies is due to cardiac insufficiency and, furthermore, that there is usually an increase in the lung markings due to vascular congestion and edema. The author postulates asphyxia during birth as the mechanism for dyspnea in the full-term baby and in the premature child born without asphyxia. A defective respiratory mechanism is also presupposed.

Krause


Three cases of pheochromocytoma associated with multiple neurofibromatosis are reported, which, in the authors' search, brings the reported cases of this combination to a total of 35. One other patient had this combination plus a cerebellar hemangioma. One additional patient also had Von Hippel-Landau's disease—one or more angiomatous malformations of the retina, each supplied by a dilated artery or vein. These lesions progress to form hemorrhages and exudates and finally lead to retinal detachment. Cystic hemangioblastoma of the cerebellum may also be found. Cystic lesions of the pancreas and kidney may occur. The authors conclude that the association of these familial disorders of the neurectoderm with pheochromocytoma is not only helpful in the clinical diagnosis of the pheochromocytoma, but strengthens the concept of the ectodermal origin of the related disorders.

Rinzler


The flow rates through the internal carotid and vertebral arteries were determined in 61 cadavers. These were compared with a mean antemortem blood pressure. There was a negative correlation of high significance between flow in both vertebral arteries and blood pressure. The correlation was greater than that for the flow in both internal carotid arteries and blood pressure. In addition, there was a definite relationship between total flow in all 4 major cervical arteries in the presence of spontaneous "strokes." The authors suggest that these results are compatible with the hypothesis that high blood pressure is an adaptation to restriction of flow in the vertebral arteries. Moreover, there is confirmation of the evidence that "earshot/vertebral stenosis" may be the cause of most cases of cerebrovascular disease.

Sheps


In potentially reversible cardiac lesions such as acute myocardial infarction, massive pulmonary embolism, and in some cases of congestive heart failure mechanical support of the circulation may be beneficial. The authors present a closed system for venoarterial pumping without oxygenation. The system was stable and non-traumatic and was suitable for prolonged use. The technique of use is described. Venoarterial pumping was performed for 52 hours in dogs with subsequent survival and for 26 hours in man.

Kitchell


Simultaneous determinations of the levels of serum glutamic oxalacetic acid transaminase and serum lactic dehydrogenase were made on 60 patients between 12 and 48 hours after the onset of the initial symptoms of acute myocardial infarction. These lesions were verified by serial electrocardiographic changes, necropsy evidence, and a classical history. All the patients exhibited elevated levels of transaminase, whereas only 35 patients had elevated levels of lactic dehydrogenase. The assay of transaminase would appear to be sufficiently superior to that of lactic dehydrogenase to confirm an impression of acute myocardial infarction between 12 and 48 hours of its occurrence.

Sheps


The heart rate pattern of a 25-week fetus was studied prior to and during labor, until its death.
in utero. An intrauterine electrode was placed directly on the fetus, and a continuous electrocardiographic tracing was recorded. The effects of uterine contractions, umbilical cord compression, and other procedures were discussed. Present clinical methods of determining fetal distress are often inaccurate. The fetal heart rate may return to "normal" after profound bradycardia following contraction or other manipulation of the umbilical cord. Thus a wait of 30 seconds after a contraction, before checking the heart rate, may cause a period of bradycardia to be missed. "Pathologic" bradycardia occurring many hours before death is described. The electrocardiographic pattern changed from a narrow U shape to become wider and deeper as the infant deteriorated and died. S-T segment depression was found to occur too late to have much clinical value as a sign of fetal distress.

MAXWELL


A variety of technics were utilized to resuscitate dogs placed in ventricular fibrillation by an electrical current. Under ideal conditions—good oxygenation, sudden circulatory arrest, and light anesthesia—electrical countershock was effective when applied directly to the myocardium and also through the closed chest. When the breakdown of circulation was short, there was invariably a satisfactory return of blood pressure to normal and the electrocardiogram indicated a supraventricular rhythm. However, about 50 seconds appeared to be a dividing line between satisfactory and unsatisfactory defibrillation by external countershock. Beyond this time point, defibrillation could always be accomplished, as indicated by the electrocardiogram, but there was seldom a return of a satisfactory blood pressure or pulse. External stimulation (pacemaker) under the conditions of a cyanotic myocardium was apparently not too successful. Under these situations surgical exposure of the heart followed by a short manual pumping of the heart quickly and successfully restored the blood pressure to normal level. Another valuable procedure was the intraarterial perfusion of epinephrine and dextrose solution under 200 mm. Hg pressure through a large bore needle. Oxygenated blood in place of all or a part of the dextrose solution was also efficacious. The heart that is found in a state of cardiac asystole could be reactivated to produce an effective circulation by the intraarterial perfusion of 5 per cent dextrose and 1 or 2 mg. of epinephrine solution.

Sheps


Three patients with pheochromocytoma are reported. The first 2 were unusual in that the presenting symptoms were those of gastrointestinal bleeding. In each of these patients thorough studies, including exploratory laparotomy in 1, revealed no evidence of any lesion of the gastrointestinal tract. It was believed that in these patients unusual rises of blood pressure resulted in rupture of small blood vessels within the gastrointestinal tract. In 1 of these patients pain in the left costovertebral angle was severe with attacks, and the pheochromocytoma was found in the left adrenal gland. In the third patient the tumor was found in the midabdomen between the vena cava and aorta, just below the level of the renal vein. It is pointed out that only 10 per cent of pheochromocytomas occur in an extra-adrenal location. A diagnosis of pheochromocytoma should be considered in paroxysmal hypertension, sustained hypertension with hypermetabolism or vasomotor episodes, children with hypertension in the absence of renal disease, and in patients showing an excessive response to histamine during gastric secretion tests. Adrenolytic or provocative drugs and the determination of urinary catechol amines are at present the best tests available for diagnosis.

X-rays of the genitourinary and gastrointestinal tracts may be of value when the tumor is large. The risk of retroperitoneal pneumography is greater than that of exploratory laparotomy and less informative. It is pointed out that the transabdominal approach allows for exploration of both adrenal areas as well as the para- and prevertebral areas. Preparation with regitine prior to laparotomy is advisable to alleviate rise of blood pressure with manipulation of the tumor. Levophed is available to counteract hypotension in the immediate postoperative period. It is also well to have neosynephrine, adrenal cortical extract, and whole blood readily available. The importance of the surgical removal of these lesions is emphasized by the observation that approximately 800 deaths annually are due to pheochromocytoma. Most of these deaths are avoidable, if the diagnosis can be made.

Levinson