ABSTRACTS

Editor: Stanford Wessler, M.D.

Abstracters

Jonas Brachfeld, M.D., Philadelphia
Massimo Calabresi, M.D., West Haven
Robert Kalmasohn, M.D., Los Angeles
Harold Karfman, M.D., Los Angeles
Herbert J. Kayden, M.D., New York
J. Roderick Kitchell, M.D., Philadelphia
Seymour Krause, M.D., Pittsburgh
George S. Kurland, M.D., Boston

Eugene Lepeschkin, M.D., Burlington
Julian P. Levinson, M.D., Pittsburgh
Morton H. Maxwell, M.D., Los Angeles
Milton H. Paul, M.D., Chicago
Wayne R. Rogers, M.D., Portland
Elliot L. Sagall, M.D., Boston
Alexander Schirger, M.D., Rochester
Sheldon Sheps, M.D., Winnipeg

SURGERY AND CARDIOVASCULAR DISEASE


Hemodynamic data obtained from left heart catheterization of 19 patients with severe aortic stenosis before and after transaortic valvuloplasty are presented in detail. With pure aortic stenosis the cardiac index was normal, but was reduced with concomitant aortic regurgitation and mitral or coronary heart disease. Progressively severe aortic stenosis often became associated with a reduced cardiac output and a small mean pressure difference across the aortic valve. In 11 patients a small, but significant, increase in the calculated aortic valve area was found postoperatively. In these patients there was an associated marked fall of left ventricular systolic pressure, transvalvular pressure difference and left ventricular work while cardiac output remained unchanged. In 8 patients no change was found in the valve area postoperatively. In these patients the left ventricular systolic pressure and transvalvular pressure difference was also decreased, but this was found to be the result of reduced cardiac output. Six of the 8 operative failures occurred in 7 patients with clinically "insignificant" aortic regurgitation as the only complicating lesion. Associated mitral stenosis, mitral regurgitation, or coronary disease did not preclude successful surgery for aortic stenosis. In regard to the indications for aortic valve surgery it is concluded that surgery should be withheld until the development of angina, syncope, or heart failure, the onset of which indicates a poor prognosis with a life span of about 2 years. In this clinic the surgical risk employing these indications was between 8 and 10 per cent.

Sagall


The long-term results of 141 patients who had 150 shunt operations for congenital cyanosis were evaluated. The more important of the preoperative factors adversely influencing the postoperative prognosis included: (1) those patients in which the malformation was not that of the classic tetralogy of Fallot; (2) those patients with electrocardiographic features of left or of extreme right ventricular hypertrophy; (3) those patients who were younger than 2.5 years or older than 17 years; (4) the patients in whom the cardiothoracic ratio by x-ray was 55 per cent or more; (5) the patients with hemoglobin levels less than 70 per cent or greater than 150 per cent; (6) the patients who were underweight by more than 10 per cent of the normal values; and (7) those patients in whom the signs of circulatory disturbances were accentuated at birth. When the above factors indicated a favorable preoperative prognosis, the operative mortality rate was only 4 per cent and the postoperative results were good to excellent in 90 per cent. In those patients
with an unfavorable preoperative prognosis the mortality rate was 10 times higher. The most successful results were obtained with the Potts operation. The majority of the unfavorable results developed during the first postoperative years. After 2 years or more a remarkable stabilization of the amelioration obtained from the operation (Potts, Blalock, and Broek procedures) was observed. In some, this amelioration was progressive, with the patients becoming better and not worse as time passed. In some patients, even after a period of several years, normal cardiac function was found by a special cardiac function test employed by the authors.

SAGALL

SURGERY AND CARDIOVASCULAR DISEASE


A 34-year-old woman was subjected to surgical closure of an atrial septal defect under extracorporeal circulation. One month after the intervention she showed fever and chest pain, with elevation of sedimentation rate and C-reactive proteins, subsiding after corticoid treatment; electrocardiogram and heart size remained unchanged. These were the typical symptoms of the "post-commissurotomy syndrome" except that pericardial or pleural effusion was absent. Similar changes were reported by authors after operative treatment of congenital heart disease. The "post-commissurotomy syndrome" accordingly is not specific for rheumatic heart disease and therefore cannot be ascribed to reactivation of a rheumatic process.

LEPESCHKIN


Eighty-one patients underwent open-heart surgery with a combination of low-flow extracorporeal circulation (DeWall oxygenator delivering flows of 15 to 50 ml. per minute per Kg.) and hypothermia (not under 30 C.). Nitrous oxide-oxygen anesthesia at extremely light planes was maintained with muscular relaxation being provided by succinylcholine drip. In order to counteract the acidosis usual in slow-flow perfusion, the patients were hyperventilated. The average blood pH was 7.50 during the procedure but sank to 7.31 in the recovery room. Twelve patients died following the operation, but all awakened immediately afterward and did not show central nervous system damage. A marked slowing of the encephalographic waves with increase of amplitude usually appeared at the beginning of low-flow perfusion but disappeared in 2 or 3 minutes. This pattern was the best indicator of cerebral hypoxia and was particularly useful in determining whether the cardiac function was adequate after termination of extracorporeal circulation.

LEPESCHKIN

UNCOMMON FORMS OF HEART DISEASE


Fifty-three Nigerian patients are described who suffered a condition resembling rheumatic heart disease with an unusual distribution of lesions. The patients, mainly children and young adults complained of cough, breathlessness and chest pain; about half presented frank cardiac failure. The clinical picture was dominated by signs of mitral incompetence and pulmonary hypertension. There was never evidence of mitral stenosis or aortic valve involvement. In 16 patients, there were, in addition, signs of acute carditis. Radiologically, the heart was always enlarged characteristically on the right; the electrocardiogram also reflected right ventricular dominance and atrial enlargement. Cardiac catheterization confirmed the presence of pulmonary hypertension. In active carditis, antistreptolysin-O titers were elevated. Eleven cases were examined post mortem and showed left ventricular fibrosis affecting the endocardium and sometimes extending into the myocardium. The chordae of the mitral valve were commonly involved. Endocardial thrombosis was frequently present. The largest chamber was the right atrium in which aneurysmal dilatation produced gross incompetence of the tricuspid valve. Histologically, perivascular collections of cells were noted, indistinguishable from Aschoff nodes.

KURLAND


Fourteen cases of influenza, observed during the 1957 epidemic, were associated with cardiac disability. Atrial fibrillation was precipitated in 8 cases and atrial flutter in 1. In 4 of these the

Circulation, Volume XXII, July 1960
electrocardiogram revealed signs of an underlying myocardial defect. Angina of effort was initiated in 2 of the 4 cases with coronary symptoms and the ischemic state was accentuated in 2. Influenza also increased the electrocardiographic abnormality in the latter 2 cases. In the remaining case, there was underlying myocardial abnormality of unknown etiology. The authors suggest that influenza appears to have a definite although transitory toxic effect upon the myocardium.

SHEPS

VALVULAR HEART DISEASE

Left atrial puncture was performed on 63 patients with mitral valvular disease. After measurement of the left atrial pressure, the catheter was passed through the mitral orifice into the left ventricle so that the diastolic pressure gradient between the 2 chambers could be calculated and a withdrawal curve from the left ventricle to the left atrium registered. The diagnosis in each case was verified by surgery. In 56 patients with mitral lesions—pure mitral stenosis in 35 and dominant mitral stenosis with a certain degree of regurgitation in 21—there was a positive diastolic pressure gradient between the left atrium and the left ventricle varying between 36 and 1 mm. Hg, with a mean value of 10.5 ± 0.9 mm. Hg. In the remaining 7 patients who had a mitral lesion in combination with other heart disease there was a positive diastolic pressure gradient between the left atrium and the ventricle, varying between 15 and 1 mm. Hg, with a mean value of 6.4 mm. Hg. In 14 patients the minute volume flow was measured during the determination of the pressure gradients. In this group there was a slight but probably not significant correlation between these 2 factors. No correlation was evident between the degree of pressure gradient and the size of the mitral orifice as determined at operation, the heart volume, or the patient's working capacity. It is concluded that a diastolic pressure gradient over the mitral orifice of at least 5 mm. Hg indicates the presence of a stenotic component in the mitral valves, but this pressure gradient does not help in separating pure mitral stenosis from mitral stenosis with regurgitation, nor does it help in evaluating the degree of such mitral regurgitation.

SAGALL


Of 16 patients with mitral disease examined with the method of Riley and Cournand, 2 showed normal oxygen diffusion capacity but an increased pulmonary dead space or increased admixture of venous blood. One patient showed decreased oxygen diffusion capacity while other values were normal; in the remaining 13 patients all values were abnormal. These findings were explained by the accentuation of alveolar and capillary walls, bronchial obstruction, and the presence of anastomosis between pulmonary arteries and pulmonary veins as well as between the latter and bronchial veins.

LEPESCHKIN


Left heart catheterization with direct percutaneous puncture of the left ventricle is the safest, easiest, and most reliable method of measuring the pressure difference across the aortic valve. This procedure is a valuable tool in judging the severity of aortic stenosis for preoperative selection and postoperative evaluation of patients undergoing surgery. The procedure is usually combined with a direct brachial artery recording. It is performed at the same time as right heart catheterization and can be completed in but a few minutes. In the author's cases, 12 of the first 14 punctures resulted in successful entry into the left ventricle.

KITCHELL


A 51-year-old man with isolated pulmonic valve insufficiency of at last 13 years' duration was followed for 26 months. During this time there was no evidence of deterioration of the right ventricle. Other clinical and experimental observations are presented and discussed indicating that isolated pulmonic valve insufficiency is a well-tolerated lesion, unless complicated by pulmonary artery hypertension, and that by itself this lesion does not induce pulmonary hypertension.

SAGALL

In 50 patients with mitral stenosis the interval between the beginning of the aortic second sound and that of the mitral opening snap decreased with increase of the mean pulmonary capillary pressure, measured at the same time by cardiac catheterization. However, the scatter was quite considerable. When the interval was plotted against the difference between aortic pressure at the time of the second sound and the mean capillary pressure, all points fell nearly on a straight line. This aortic pressure was calculated from the blood pressure, determined by the auscultatory method, by adding to the diastolic pressure a fraction of the pulse pressure corresponding to the position of the incisura in the carotid pulse, optically registered with the phonocardiogram. The relaxation velocity of the left ventricle was 10.06 (8.5-11.5) mm Hg per 0.01 second. This value was independent of the heart rate and the pulmonary capillary pressure, and could be used with greater accuracy than previous methods for estimation of left atrial pressure from the time of appearance of the mitral opening snap.

LEFESCHKIN


The results obtained by open operation for the correction of mitral valvular disease and concomitant tricuspid-annulus plication are presented. The 8 patients were in class 3 or 4 on the basis of cardiac status at the time of optimum medical management. The tricuspid insufficiency was considered to be secondary to mitral valvular disease. Repair was done under total cardiopulmonary bypass by way of the lateral wall of the right atrium and the interatrial septum. Plication of the annulus of the tricuspid valve was performed in each case. Either direct-vision commissurotomy or annulus plication was carried out on the mitral valve. One patient died because of uncontrolled ventricular fibrillation, which had its onset several minutes after restoration of cardiac action. The second patient had very high pulmonary vascular resistance and died shortly after restoration of rhythm to atrial fibrillation. Two late deaths occurred 40 and 70 days after surgery, because of wound infections. The remaining 4 patients (2 with stenosis and 2 with regurgitation) followed 2 to 12 months postoperatively, showed significant improvement in cardiac size and contour, exercise tolerance, and physical signs. On the basis of this experience, the authors suggest that unmitting tricuspid insufficiency is an additional indication for open-heart surgery of mitral stenosis. Moreover, when open repair is required for the mitral valve because of predominant regurgitation, concomitant tricuspid valve repair should be done. Every effort should be made to abolish secondary tricuspid insufficiency by medical means before surgery. Associated aortic stenosis may be dealt with at the same operation. Significant aortic regurgitation is a complicating factor in open valvular surgery for technical reasons. In addition, severe pulmonary vascular changes are a deterrent to this form of mitral-tricuspid surgery.

SHEPS


In 12 patients with severe pulmonic stenosis who were treated with valvulotomy the preoperative and postoperative electrocardiograms, and vectorcardiograms were correlated with hemodynamic data. No close correlation was found preoperatively between the level of right ventricular systolic pressure nor between the systolic gradient across the pulmonic valve and the electrocardiographic changes or the configuration of the QRS complex loop of the vectorcardiogram, but those patients with the highest right ventricular pressures tended to show inverted T waves in the precordial leads and rightward deviation of the electrical axis. Postoperatively, in any given case, serial electrocardiographic and vectorcardiographic changes did correlate with changes in the right ventricular load. In this series incomplete regression of the electrocardiographic and vectorcardiographic signs of right ventricular hypertrophy were found to indicate either an inadequate period of observation, incomplete correction of the stenotic lesion or the presence of other hemodynamically significant defects.

SAGALL