The patient began then to complain of strangulation, and on account of a tentative diagnosis of pericardial effusion an attempt was made on September 2nd to perform paracentesis of the pericardium. No fluid was obtained, but owing to the evident distress of the patient the attempt was not persisted in. Thereafter the patient became more dropsical, cyanosed, and breathless, and died fairly suddenly on September 6th.

Post-mortem Findings

At necropsy the body presented to external examination generalized oedema and pallor of the skin. The liver dullness noted in life had markedly diminished.

Thorax.—There was free fluid in the pleural cavities, and the lungs presented an extreme appearance of chronic venous congestion (brown induration). The pericardium contained about six to eight ounces of straw-coloured fluid, and the enlarged heart was in diastole.

Abdomen.—The stomach and intestines were normal. The liver was slightly enlarged, and showed the characteristic nutmeg appearance of chronic congestion. The spleen and kidneys were also in a state of chronic congestion. No infarcts were seen in the organs.

Heart.—This was in a state of dilatation, and the muscle flabby. On the anterior aspect there was a broad, whitish patch of fibroid change. The heart, on being opened, was found to be full of clot, some of which was easily washed away, leaving in the left ventricle a large amount of semi-organized tough clot adherent to a broad area of the myocardium and, more or less filling the cavity of the left ventricle. The valves were of normal appearance, although dilated. The myocardium of the left ventricle was thinned at the site of attachment of the clot. A patch of atheroma was visible on the aorta at its origin. A photograph of the interior of the left ventricle is reproduced (Fig. 3).

Pathologist's Report

The heart was sent to Dr. J. Ferguson Heggie of the Pathology Department, University of Glasgow, for examination, and he reported as follows:

"The heart is rather soft. The left ventricle is much dilated, especially in the apical portion, where the wall is thinned and stretched. There is much fibrosis in the left ventricular wall in its anterior distal part, with atrophy of the myocardium, hence the dilatation. Over the fibrosed area there is much laminated thrombus, part of which is old and organized, and part of which (superficial) is more recent. The valves are healthy; the remainder of the left ventricle and the remaining chambers are slightly dilated, but free from any gross lesion. The area of the left ventricle which is fibrosed is that supplied by the descending branch of the left coronary artery; this vessel shows marked reduction of the diameter of the lumen at a point one inch from its origin. At this point there is an atheromatous lesion occluding the greater part of the lumen, while in addition, more superficially, a patch of non-specific fibrosis of the epicardium constricts the vessel from without. The remaining coronary vessels show early atheroma, with little or no reduction of their lumen. Histological examination confirms the character of the coronary lesion and the per-arterial starvation atrophy of the myocardial cells, with resulting fibrosis of the wall of the left ventricle. There is no histological evidence of infarction of the ventricular wall in the affected region."

Summary

We report a case in a young adult of primary atheroma of the left coronary artery, with resultant fibrosis of the myocardium of the left ventricle and the formation of thrombus in the ventricle during life. The lack of infarcts is perhaps explained by the partial organization of the clot.

We are indebted to Dr. A. G. Brand for the two x-ray plates reproduced herewith, and to Dr. J. F. Heggie of the Pathology Department, University of Glasgow, for the pathological report.

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CARCINOMA OF THE SUPRARENAL CORTEX ASSOCIATED WITH HYPERTENSION

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(With Special Plate)

The following case of suprarenal tumour has some interesting features which make it worth recording.

Case Report

A woman, aged 30, was admitted to the Glasgow Royal Infirmary on August 9th, 1933, with the following history. Nine weeks before admission she developed a tingling sensation in the left arm and in the left side of the face without marked loss of power. This persisted, and two weeks before admission she found when she awoke one morning that she had lost the power of her right arm and leg. She regained the power of her leg, but her arm remained weak. Her eyesight had been failing for three weeks prior to admission. No previous illnesses were noted.

On admission the patient was found to be very obese, with a florid complexion and marked hirsuties on the upper lip and side of face. There was a right-sided facial paralysis, and the right arm and leg were weakened. The reflexes were normal. The heart was enlarged and the sounds accentuated, but pure in type. The blood pressure was—systolic 210, diastolic 120; the pulse rate varied between 84 and 116. There was no abnormality in the respiratory and alimentary systems. Ophthalmoscopic examination showed neuro-retinitis, with many haemorrhages and much exudate in both fundi. The Wassermann reaction was negative. Blood urea was 27 mg. per cent. There was a trace of albumin in the urine all the time the patient was in hospital, and also a quantity of sugar, which varied between 2.1 and 8.75 per cent.

The case was diagnosed as one of cerebral tumour, and was transferred to the surgical house, where, on September 1st, 1933, under local anaesthesia, a decompression operation was performed in the left parietal region. The patient became comatose soon afterwards, the temperature rose steadily to 107° F., the pulse to 160 per minute, and death took place the following day. A post-mortem examination was carried out thirty-six hours after death. The body was noted to be that of a very obese, youngish woman. Growth of hair was marked on the upper lip and on the side of the face.

POST-MORTEM FINDINGS

The pericardium was normal. The heart weighed 600 grams, and showed dilatation of the right ventricle, with well-marked hypertrophy and slight dilatation of the left ventricle. The tricuspid and mitral valves were normal, but their rings were slightly dilated, taking four and three fingers respectively. There was atheroma of the aorta, with multiple yellowish and white patches of thickening, and some calcareous deposit in places.

The pleurae were normal; the right lung weighed 700 grams, the left 520 grams, and both showed a very early bronchopneumonia. There was no abnormality in the trachea or oesophagus. The peritoneum and the stomach and intestines were normal, although there was a considerable deposition of fat around all the abdominal organs and in the mesentery. Marked post-mortem changes without other abnormality were seen in the liver, which weighed 1,600 grams. The gall-bladder, the spleen (which weighed 165 grams), and the pancreas were normal, as also were the kidneys (right 195 grams, left 185 grams), apart from post-mortem decomposition.

The larger part of the right suprarenal was replaced by a cystic swelling, which was roughly circular, and measured 3 cm. in diameter and 1.5 cm. in thickness. The left suprarenal appeared, if anything, slightly smaller than normal. A piece of bone had been trephined from the left parietal region of the head and replaced. The brain weighed 1,240 grams. There was a recent softening lying in the region of the basal nuclei of the left side, 7 mm. in diameter, and involving the

grey matter of the outer edge of the optic thalamus about the middle and the internal capsule in the neighbourhood. Many other softenings, older than the last and varying in size up to that of a pea, were found scattered throughout the white matter of the rest of the brain. The vessels of the circle of Willis showed a moderate degree of atheroma.

MICROSCOPICAL EXAMINATION OF TUMOUR

The suprarenal tumour was fixed whole in formalin. When cut it was found to have a fairly well defined fibrous capsule and its interior to be very dark in colour, with yellow areas and some haemorrhage. Microscopical examination showed much necrosis of the tumour tissue. This was probably largely post mortem, owing to the time between death and the necropsy. Many saprophytic organisms were seen in sections. In the better-preserved parts the cells had an alveolar arrangement, with a varying quantity of stroma between, resembling roughly the zona glomerulosa of the normal suprarenal. There were capillary blood vessels in the stroma, but they were not numerous. The cells comprising the tumour varied in size and nuclear structure; some contained large globules of fat, others had eosinophil protoplasm, which had a foamy appearance. The nuclei also varied very much in size, and most were colloid in character and speckled with fine chromatin granules. The characteristic feature of the tumour was the presence of giant cells with foamy protoplasm, and containing two or more very large nuclei, which in turn often contained one or two roughly rounded dark blobs, like nucleoli. An occasional nucleus was almost completely filled by a clear globule. One or two areas of massive haemorrhage were seen.

The diagnosis made was carcinoma of the suprarenal. The kidneys, pituitary, and thyroid showed no abnormality.

Discussion

There are three interesting features of this case. First, the marked growth of hair on the upper lip and face suggested the presence of virilism, which was, unfortunately, not confirmed by a complete history. Adrenal virilism and pubertas praecox are, however, well-known accompaniments of suprarenal cortical tumour, and need not be considered further here. Secondly, there is the hypertension; this is the important feature of the case. A systolic pressure of 200 mm. in a patient of 30 years with no evidence of renal disease is by no means common, and when a tumour of the adrenal is found as an accompaniment one is led to believe that there is more than coincidence at work.

Perusal of the literature shows that, although carcinoma of the suprarenal cortex associated with hypertension is little known in this country, the syndrome is familiar abroad. Murray and Simpson reported the case of a woman, aged 36, who had hair on the face and all the signs of virilism. Her blood pressure was 200 mm. of mercury. A large tumour was removed from the suprarenal and the signs of virilism disappeared, while the blood pressure fell nearly to normal. Margarete Winkel described the case of a female, aged 36, who for eleven years previously had gradually developed male characters and was found to have a high blood pressure, glycosuria, and a relative polymorph neutrophil leucocytosis. She died two days after removal of a suprarenal tumour.

A man of 42, with diabetes, high blood pressure, hypertrophy of the heart, and atherosclerosis, was found to have an atrophic pancreas and a suprarenal tumour on each side. Schröder, who recorded the case, ascribed the condition to excessive secretion of adrenaline by the tumour. Langeron and Lohéac in their studies came to the conclusion that primary suprarenal tumours may set up arterial hypertension, which might be associated with a cortical carcinoma when it was continuous in type, or with a paraganglioma of the medulla when it was paroxysmal. They concluded that suprarenal tumours of any kind, when accompanied by hypertension, contain

more adrenaline than the normal gland, and that this evidently constitutes the mechanism by which the tumours lead to arterial hypertension.

It was formerly believed that Addison's disease, with its marked arterial hypotension, was due to a deficient secretion of adrenaline into the blood stream because of destruction of the adrenal medulla. Recent work by Swingle and Pfiffner and others suggests that the deficiency of Addison's disease is one of the cortex, and not the medulla. Rowantree and his co-workers in America and Levy Simpson in this country have treated the disease by cortical extracts with some success. If Addison's disease, therefore, be due to deficient production of some cortical secretion we may be entitled to suggest that the excessive production of this same substance is the cause of the hyperpiesia in cortical carcinoma rather than excessive secretion of adrenaline. The presence of glycosuria in the case here recorded and in others in the literature is worth noting, and might be readily understood if one remembers the close association between the endocrine glands and how disturbance of the secretion of one may lead to dysfunction of another. The third interesting feature is the similarity of the signs and symptoms to those of cerebral tumour. This is not confined, however, to cases of hyperpiesia due to suprarenal tumour, but to all high blood pressure cases where minute softenings from spasm or thrombosis of arterioles in the brain cause transient or permanent paretic disturbances.

Summary

1. A case of hypertension associated with a carcinoma of the cortex of the suprarenal is described.
2. Other similar cases in the literature are noted.

My thanks are due to Dr. Middleton, who kindly supplied me with the clinical history of the case, and to Professor J. Shaw Dunn, for his keen interest and help at all times.

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During the eleventh year of the Ella Sachs Plotz Foundation for the Advancement of Scientific Investigation twenty-seven grants were made, fourteen being to workers outside the United States. The Foundation has now been responsible for a total of 227 grants for researches in four of the five continents. Two of the recent grantees are working in England. Dr. P. Ellinger has been continuing in London his work on the physiology, pathology, and pharmacology of the kidney, and on the application of *intra-vitam* staining to the cytology of the beginnings of cancer. Dr. H. D. Kay is investigating the relationship of phosphorus deficiency to rickets. It is announced in the annual report of the Foundation that during the present great need of funds grants will be given to those working in sciences closely related to medicine without reference to any special fields, but the maximum size of grants will usually be less than 500 dollars. Applications for grants to be held during the year 1935-6 must reach Dr. J. C. Aub, Huntington Memorial Hospital, 695, Huntington Avenue, Boston, Massachusetts, before May 1st next. There are no formal application sheets, but those applying must state definitely the qualifications of the investigator, the character of the proposed research, the amount of grant requested, and the specific use to which it would be devoted. It is also desirable to include letters of recommendation from the directors of laboratories or clinics in which the work will be done.

JAMES GRANT AND JOHN H. MILLER: ATHEROMA OF CORONARY ARTERY AND MYOCARDIAL FIBROSIS

FIG. 1.—(G. L., 4/4/34.) The enlarged heart shadow and increased density of the left mid-zone is evident.

FIG. 2.—(G. L., 29/8/34.) The heart enlargement is now colossal and nearly obliterates the lower half of the left lung.

FIG. 3.—(G. L., 7/9/34.) Interior of left ventricle, showing extensive thrombus (T) adhering to the thinned wall.

ALEXANDER LYALL: CARCINOMA OF SUPRA-
RENAL CORTEX ASSOCIATED WITH HYPERTENSION

Suprarenal tumour showing typical giant cell. ($\times 200$.)