the larger infarctions. *Abdomen*: The liver showed chronic nutmeg change with early cardiac cirrhosis. The spleen was about one and a half times normal size. The remaining abdominal organs were normal. *Lymphatic System*: The glands of the neck and chest were grossly oedematous and much enlarged, but the cut surface appeared normal. The brain was not examined. Cause of death: (a) congestive cardiac failure, and (b) myxoma of left auricle.

COMMENT

Viewing this case retrospectively, it is unlikely, even if the true diagnosis had occurred to us as a possibility, that we would have been disposed to retreat from the diagnosis of mitral stenosis, since the clinical pattern could be fairly well correlated with its aetiological type and the signs of failure were not disproportionate to the physical findings. Like most cases of cardiac myxoma, however, this one presented with severe cardiac failure, relentlessly and rapidly progressing and failing to respond to any treatment. A large proportion of the cases in the literature presented with systolic and diastolic apical murmurs. Several of the features frequently found in myxoma of the heart were absent: namely, preference for lying flat for the relief of the dyspnoea; embolic phenomena from fragments of the tumour; sudden onset with fainting attacks; and sudden death.

The E.C.G. did not show enlarged P waves and right ventricular strain as reported in some cases.

The deceptive resemblance of this case to one of mitral stenosis, when considered feature by feature, was quite remarkable.

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C. F. J. CROPPER, F.R.C.P.Ed.,
Consultant in Medicine.

D. P. WINSTANLEY, M.R.C.P.,
House-physician.

Ronkswood Hospital,
Newtown Road, Worcester.

Sudden Operative Death Due to Tumour Embolism

Sudden and unexpected death on the operating table is, fortunately, a rare occurrence. The following unusual case is reported.

CASE REPORT

A man of 63 gave a history of repeated vomiting for nine months, during which time he had lost about 2 st. (12.7 kg.) in weight. There were no urinary symptoms.

On examination he was thin and had obviously lost weight. He was 5 ft. 4 in. (163 cm.) tall and weighed about 8 st. 12 lb. (56.2 kg.). There were two upper abdominal scars from previous operations. His first operation was probably for closure of a perforation and the second was a gastro-enterostomy performed in 1931. The right kidney was enlarged. The left kidney, liver, and spleen were not palpable. Clinical examination of the respiratory and cardiovascular systems showed no abnormality except mild hypertension (B.P. 160/90). The Hb was 83% (Sahli). The W.R. was negative. Pyelography revealed a gross filling defect of the right renal pelvis and calices, suggestive of a renal tumour. Chest x-ray examination showed no evidence of metastatic disease. As a result of these findings a right nephrectomy was undertaken.

The patient was given morphine, $\frac{1}{2}$ gr. (11 mg.), and atropine, 1/100 gr. (0.65 mg.), subcutaneously an hour before operation. Anaesthesia was induced with thiopentone, 400 mg., and D-tubocurarine chloride, 15 mg. After inflation of the lungs with oxygen, a cuffed endotracheal tube was passed under direct vision. Anaesthesia was maintained with cyclopropane and oxygen, respiration being assisted for about 10 minutes but controlled thereafter.

With the patient in the lateral position, an incision was made parallel to the right 12th rib, extending round into the right iliac fossa. The muscles were divided and the perinephric fat was exposed. A very large irregular hypernephroma presented; it was exceedingly difficult to mobilize.

On its surface were numerous large distended veins suggesting obstruction of the renal vein.

The patient's condition was quite satisfactory and his blood pressure was well maintained until about half an hour after the start of the operation, when his pulse ceased suddenly. Confirmation of the absence of the heart beat was obtained by palpation of the aorta. At this point the tumour had been mobilized and all but delivered through the incision. Methedrine (30 mg.) was injected intravenously, the veins being still prominent, and cardiac massage attempted, but without effect. Death was apparently immediate. There was no bronchospasm, since inflation of the lungs was uniformly easy at all times.

The main finding at necropsy was a large tumour embolus in the right pulmonary artery, completely occluding this vessel. There were no metastatic deposits in the lungs. The para-aortic glands, from the coeliac axis to the bifurcation of the aorta, were invaded by tumour, and metastases were present in the bodies of the 12th thoracic and first three lumbar vertebrae. The right kidney had been removed at operation. No tumour was discovered in the remaining small proximal portion of renal vein and there was no evidence of tumour in the inferior vena cava. Apart from the above findings and the presence of a long-standing gastro-enterostomy and one or two old adhesions between the duodenum and coils of jejunum, there were no other pathological findings.

The specimen removed at operation consisted of a kidney and tumour weighing 945 g. It measured 6 by 6 by 3 in. (15 by 15 by 7.5 cm.). Only the upper pole of the kidney with two pyramids remained intact. The rest of the kidney was invaded, and stretched over a mass of tumour which had compressed and distorted the renal calices and pelvis, but had not appeared to invade them. Externally the tumour had caused coarse lobulation of the kidney; much of it was necrotic and haemorrhagic, and the best-preserved portion consisted of lobules of soft greyish-white tumour tissue. The growth was confined laterally by a peripheral zone of renal substance and renal capsule; medially it had extended towards the midline and projected $2\frac{1}{2}$ in. (6.3 cm.) beyond the normal pelvi-ureteric junction. No invasion of renal veins could be seen on naked-eye examination of the specimen.

Microscopically the tumour was a renal carcinoma which, in the better-preserved areas, was composed of large cuboidal cells arranged both in a coarse papilliferous manner and in solid sheets of cells. The nuclei were vesicular, and many of them contained a single prominent nucleolus; mitotic figures, although present, were few in number. Necrosis and haemorrhage were widespread throughout the tumour. Although no tumour was seen in the renal vein on naked-eye examination, it was obvious microscopically that several larger veins at the hilum of the kidney had become involved.

The embolus in the pulmonary artery was composed of tumour cells similar in appearance to those of the primary growth in the kidney.

The cause of death in this case was a massive pulmonary embolus of tumour tissue which presumably had been dislodged from the renal vein during operation.

Comment.—We have been able to find only two published reports (Pettersson, 1941; Mimpriss and Birt, 1949) of death due to tumour embolism at operation, which is surprising in view of the frequency with which hypernephroma spreads into the renal vein and even into the inferior vena cava.

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A. H. B. MASSON, M.B., Ch.B., F.F.A. R.C.S.,
Senior Anaesthetic Registrar,
Royal Infirmary, Edinburgh.

A. W. BRANWOOD, M.D., F.R.C.P.Ed., M.R.C.P.,
Lecturer in Pathology,
University of Edinburgh.

REFERENCES

- Mimpriss, T. W., and Birt, St. J. M. C. (1949). *Brit. J. Surg.*, 36, 429.
Pettersson, G. (1941). *Acta chir. scand.*, 84, 321.