from behind the right pole of the thyroid gland. The patient died suddenly nine hours after operation when the serum calcium was still 19 mg./100 ml.

Histologically the tumour was a chief-cell parathyroid adenoma. At necropsy there was widespread fat necrosis due to acute pancreatitis and thrombosis of the splenic, left common iliac, and femoral veins. Thrombus occluded the left renal vein to 1 cm. from the inferior vena cava. There was metastatic calcification in the tubules of both kidneys but no involvement of the smaller renal veins by thrombosis.

COMMENT

In acute hyperparathyroidism there has been little documentation of thrombosis occurring in the venous system. Smith and Cooke (1940) reported a case of hypercalcaemia due to parathyroid adenoma in which bilateral renal vein thrombosis was discovered at necropsy. Horowitz and Berenbaum (1958) report the case of a 17-year-old girl who had ante-mortem thrombus in the left main renal and ovarian vein. Stampfl (1963) has described four cases of renal-vein thrombosis in acute hyperparathyroidism. Renal-vein thrombosis may cause either nephrotic syndrome or progressive oliguric renal failure (Harrison, Milne, and Steiner, 1956), but in the absence of inferior vena caval obstruction it is usually associated with primary renal disease. In the cases reported here the primary renal damage was presumably the hypercalcaemic effect on the tubules (Epstein, 1960). In severe hyperparathyroidism there may also be a decrease in the renal plasma flow (Edvall, 1958) and an increased risk of stagnation in the renal veins. This may be aggravated by increased viscosity of the blood due to the salt and water depletion that was clinically present in both our patients and was probably due to renal losses in the presence of hypercalcaemia.

The patients demonstrate many of the other features previously described in hyperparathyroidism: mental changes, dyspeptic symptoms, acute pancreatitis, and sudden death (Fitz and Hallman, 1952; St. Goar, 1957; Hewson, 1958; Kurlander *et al.*, 1963).

We are grateful to Dr. O. M. Wrong for allowing us to study patients under his care and for his helpful criticism in the preparation of this paper. We are also indebted to the Department of Morbid Anatomy of the Postgraduate Medical School of London for necropsy and histological reports.

A. PRINGLE, M.B., B.SC., M.R.C.P., M.R.C.P.ED.,
M.R.C.P.GLASG.,
Medical Registrar.

E. K. M. SMITH, M.B., B.SC., M.R.C.P.,
Medical Registrar.
Department of Medicine,
Postgraduate Medical School of London.

REFERENCES

- Dent, C. E. (1962). *Brit. med. J.*, **2**, 1419.
Edvall, C. A. (1958). *Acta chir. scand.*, suppl. No. 229.
Epstein, F. H. (1960). *J. chron. Dis.*, **11**, 255.
Fitz, T. E., and Hallman, B. L. (1952). *Arch. intern. Med.*, **89**, 547.
Harrison, C. V., Milne, M. D., and Steiner, R. E. (1956). *Quart. J. Med.*, **25**, 285.
Hewson, J. S. (1958). *Arch. intern. Med.*, **102**, 199.
Hodgkinson, A. (1963). *Clin. Sci.*, **25**, 231.
Horowitz, W., and Berenbaum, A. A. (1958). *Ann. intern. Med.*, **49**, 181.
Keating, F. R. (1961). *J. Amer. med. Ass.*, **178**, 547.
Kurlander, D. J., Raskin, H. F., and Kirsner, J. B. (1963). *Ann. intern. Med.*, **58**, 1013.
St. Goar, W. T. (1957). *Ibid.*, **46**, 102.
Smith, F. B., and Cooke, R. T. (1940). *Lancet*, **2**, 650.
Stampfl, B. (1963). *Frankfurt. Z. Path.*, **72**, 320.

Loss of Immunity Against Vaccinia After Attack of Variola Minor

Brit. med. J., 1964, **2**, 676

An attack of variola minor produces an absolute immunity against itself ("relapse" or second attack), no instance of which occurred among nearly 14,000 cases (Marsden, 1948); against variola major—no case of cross-infection arose in this series at times when cases of variola major and variola minor were

under treatment together in the same wards; and against vaccinia as shown by the rapid decline of the success rate in vaccinations performed after the onset of the smallpox rash in some 2,000 patients in this series. But the general expectation of the duration of this immunity (which must be regarded as likely to vary within limits from case to case, as does the immunity conferred by vaccinia) remains to be determined. In the following case it was shown that the patient had lost most of her resistance to vaccinia after 33 years.

As a girl of 15 the patient was under my care in 1930, together with other members of her family, suffering from variola minor. Early in 1964 I performed a routine vaccination on her. The highly successful result is shown in the photograph, taken on the eighth day.

J. PICKFORD MARSDEN, M.A., M.D., D.P.H.

Joyce Green Hospital,
Dartford, Kent.

REFERENCE

- Marsden, J. P. (1948). *Bull. Hyg. (Lond.)*, **23**, 735.

Appearance of arm on eighth day after vaccination.