(S.G. method) 7.9 g./100 ml. Electrophoresis showed an increase in the alpha-2 globulin and gamma-globulin. Formol-gel test produced a gel with slight opacity. A swab from an infected granulomatous lesion yielded a growth of *Staphylococcus aureus* sensitive to streptomycin, tetracycline, chloramphenicol, and erythromycin. Fluid aspirated from one of the fluctuant lesions was sterile on ordinary culture but when inoculated on to N.N.N. medium and incubated at 22° C. it produced a profuse growth of the flagellate form of *L. brasiliensis*. W.R. and Kahn reactions were persistently negative. Blood urea 27 mg./100 ml. Chest x-ray examination showed nothing abnormal.

Biopsy of a lesion from the face showed a massive, rather localized infiltration of chronic inflammatory cells in the dermis and some degeneration of the overlying epidermis, which itself was covered by an inspissated serous exudate. The cellular infiltrate consisted of large numbers of lymphocytes and reticulo-endothelial cells. Within the reticulo-endothelial cells groups of Leishman-Donovan bodies were found lying in vacuoles measuring about 10 μ in diameter. The Montenegro test was positive. The Leishmanin test was negative.

Treatment was started with sodium stibogluconate ("pentostam") in a dose of 100 mg./kg. of body weight, individual doses not exceeding 6 ml. Three such courses of treatment were given at monthly intervals, the first intravenously and the other two intramuscularly. These have resulted in complete clearing of the lesions on the arms and legs, and those on the face have shown considerable improvement.

COMMENT

Some investigators have expressed the opinion that the organisms causing Oriental sore and South American leishmaniasis are different varieties and strains rather than different species. Floch (1954) has divided South

American leishmaniasis into three types which he believes to be caused by subspecies of *Leishmania tropica*: (1) Classical espundia, in which the face and nasopharyngeal mucosa are attacked, is caused by *L. tropica brasiliensis*. (2) The Mexican and Guatemalan type found among chicle gatherers presents as chronic ulceration of the ears (chiclero ulcer) and is caused by *L. tropica mexicana*. (3) Uta is a form encountered in the Guianas and Peru in which cutaneous lesions develop, rarely break down, and seldom extend to mucous membranes; the course of this disease is relatively mild and less destructive than espundia. The case presented would seem to fit into this group. However, Snow *et al.* (1948) suggest that the varying clinical features might be due to other factors, such as differences in climate, racial immunity, or hygienic conditions.

Mangabeira-Albernaz (1947) and Jaffé (1952) have drawn attention to the development of nasal polypi as a complication of mucocutaneous leishmaniasis.

After recovery from South American mucocutaneous leishmaniasis a well-marked immunity develops (Pessoa and Pereira Barretto, 1945), but Simons (1953) points out that this immunity is not permanent, in contrast to that developed after Oriental sore.

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E. S. EMSLIE, M.B., Ch.B., M.R.C.P.Ed.,
Senior Registrar, Department of Dermatology,
King's College Hospital, London.

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Pneumaturia Due to *Candida albicans*

Pneumaturia secondary to glycosuria is not common. Spring and Hymes (1952) and Fineman *et al.* (1952) between them listed 27 cases, and since their papers five further cases have been reported (Kent, 1955; Foord *et al.*, 1956; Thomas and Sandler, 1958; Marsh, 1960). The urine usually contains *Escherichia coli*, and in only 6 of the 32 cases was a yeast isolated. The presence of a vesical neuropathy is not essential to the production of pneumaturia, but a residual urine is usually reported.

CASE REPORT

A housewife aged 68 presented with a one-year history of polydipsia, weakness, frequency of micturition, and vulval irritation. She was extremely ill, febrile, ketotic, and dehydrated. On examination there was a tender suprapubic mass and the rectum was full of faeces, but the anal sphincter was normal. She had a diabetic neuropathy and retinopathy.

FIG. 2

On admission a voided specimen of urine was acid and contained protein, acetone, a large amount of sugar, and a very large number of yeasts with numerous pus cells. Aerobic culture of the urine gave a heavy growth of *Candida albicans* and also a few colonies of *Streptococcus faecalis* and *E. coli*. The blood sugar was 457 mg./100 ml. All other relevant investigations were normal.

A diagnosis of diabetes mellitus and retention with overflow was made. After micturition the patient was catheterized and a jet of 40 oz. (1,140 ml.) of foaming turbid urine was expelled. This settled into three approximately equal layers: first a deposit of pus cells and yeasts, secondly, a supernatant urine, and thirdly foam. Continuous bladder-drainage and washouts were started, initially with a magnesium citrate mixture and later with dequalinium (decamethylene-bis-4-aminoquinaldinium). The urine was made alkaline with mist. pot. cit. (N.F.) and she was stabilized on insulin. A cystoscopy and an examination under anaesthesia performed three weeks after admission were normal. After six weeks the catheter was removed, but she still had occasional urgency of micturition.

Two months later cystometry was performed, and this showed a mild sensory neuropathy of the bladder. *C. albicans* could not be isolated from the urine, vulva, vagina, sputum, or faeces. An intravenous pyelogram showed no significant abnormality apart from a poorly emptying bladder.

DISCUSSION

It was thought that the *C. albicans* was fermenting the sugar in the urine, with the production of gas.

Of the various fungistatic agents available, dequalinium was chosen for bladder irrigation. It is soluble (Wilkinson, 1959), known to be effective against *C. albicans*, is not inhibited by serum (Babbs *et al.*, 1956), and is well tolerated by abraded surfaces (Coles *et al.*, 1958).

Dequalinium in a concentration of 0.01% in N saline was used as a twice-daily bladder washout for seven days. This produced a dramatic improvement and after four days *C. albicans* was never again isolated.

There are a few reported cases of possible *C. albicans* infection of the urethra (Harkness, 1950), of the bladder (Moulder, 1946), and of the kidney (Lundquist, 1931), but in the present case only the urine was infected.

C. albicans will grow most profusely between pH 5.1 and 6.4 (Benham, 1957). It ferments glucose anaerobically at pH 7.2 or lower to produce acid and carbon dioxide (Martin *et al.*, 1937), while a rise of pH will inhibit fermentation. The rate of growth of *C. albicans* rises in proportion to the concentration of glucose present, when this is above 150 mg./100 ml. (Johnson, 1954).

C. albicans is a normal commensal of the mucosae, and in diabetics with vulval irritation may be found in large numbers throughout the external genitalia. These profuse numbers might colonize the glucose-containing urine and ferment it if it were acid. During micturition a patient with normal bladder function would empty the bladder of urine and any *C. albicans* present. However, if there were a residual urine, due to a diabetic vesical neuropathy, *C. albicans* would increase to much higher numbers and the effect of any fermentation would then become more apparent. A large residual urine has been reported in most cases of pneumaturia associated with glycosuria. It is surprising that pneumaturia is not found more commonly in diabetic patients, among whom infections and a vesical neuropathy may occur.

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F. B. GIBBERD, M.A., M.B., B.Chir., M.R.C.P.,
Medical Registrar, Westminster Hospital.

E. R. WILLIAMS, M.A., M.B., B.Chir.,
Late House-physician, Westminster Hospital.

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Pseudohyperparathyroidism with Carcinoma of Bronchus

Hypercalcaemia associated with malignant disease is well recognized in the presence of bone metastases. However, there have been only 16 reported cases of hypercalcaemia in malignant disease without demonstrable bone metastases (case records of Massachusetts General Hospital, 1953; Connor *et al.*, 1956; Myers, 1956; Plimpton and Gellhorn, 1956; Schatten *et al.*, 1958; Lucas, 1960). The present report concerns a patient with the chemical characteristics of hyperparathyroidism with a bronchial carcinoma but no enlargement of the parathyroid tissue and no bone metastases.

CASE REPORT

The patient was a retired architect aged 73. Apart from a partial thyroidectomy and tracheostomy (on account of a goitre) at the age of 23, he had been well all his life. His complaints were loss of weight (6.5 kg. in four months), anorexia, nausea, epigastric discomfort, and constipation for two months, and for the last month he complained of general weakness, and his wife said he was becoming drowsy.

On examination his temperature was 99° F. (37.2° C.) and blood pressure 130/70. He had a dry scaling skin. He was drowsy, inattentive, and disorientated in time and space. His liver was palpable 8 cm. below the right costal margin and had an irregular surface. His sigmoid and transverse colon was easily palpable and was felt to be full of hard faeces. Rectal examination revealed a slightly enlarged prostate with a smooth surface. All tendon reflexes were present but sluggish.

Investigations.—Hb, 12.3 g./100 ml.; W.B.C., 14,000/c.mm., neutrophil leucocytosis; E.S.R., 70 mm. in first hour; blood urea, 51 mg./100 ml.; serum cholesterol, 190 mg./100 ml.; serum sodium, 132 mEq/l.; potassium, 3.7 mEq/l.; chloride, 100 mEq/l.; alkali reserve, 25 mEq/l.; serum acid phosphatase, 4 units/100 ml. Chest x-ray examination: opacity 2.5 cm. in diameter in left mid-zone. Gastro-intestinal studies: barium-meal, N.A.D.; barium enema, patient was unable to retain barium; stools for occult blood $\times 3$ were