acromegaly, including prognathism and macroglossia. Biochemical investigations were not undertaken in these cases, but necropsy revealed enlargement of the pituitary in two cases, and adenomata of the adrenal cortex and thyroid also in two cases. Secondly, a disorder of the thyroid might be suspected. Cases 1 and 2 had nodular enlargement of the thyroid; Cases 1 and 3 had low basal metabolic rates. Case 3 received thyroid treatment for two years with no apparent improvement. It would, however, be tempting to assume a disturbed target-cell sensitivity in the acral tissues, especially skin and bones, to normally secreted hormones. Recent work on the aetiology of hypometabolism may provide evidence to confirm this possibility (Kurland *et al.*, 1955).

A different mechanism which may result from opening up of the arteriovenous anastomoses in the distal parts of the extremities is suggested from the work of Flavell (1956) and Huckstep and Bodkin (1958). They demonstrated that section of the vagus nerve below the aortic arch brought about relief of the arthralgia, the oedema, and the acral enlargement in cases of inoperable lung neoplasms complicated by severe osteoarthropathy.

Summary

Four cases of the syndrome known as pachydermoperiostosis are recorded. The main features of this syndrome consist of: (1) thickening of the skin, especially over the face and scalp, which becomes drawn into thick folds; (2) marked clubbing of the fingers and toes; (3) broadening of the bones at the distal parts of the limbs with irregular periosteal new-bone formation; (4) effusions into joints, especially knees and ankles.

Two of the patients are brothers and represent a complete picture of the syndrome. The remaining two show incomplete forms. In Case 3 there is no clubbing of the fingers, although he has all the other features. Swelling of the joints is absent in Case 4. This patient, being married with two children, seems to provide an exception to the general belief that these patients are sterile.

The aetiology is unknown. The condition appears to be genetic; several theories explaining the possible mechanism are discussed.

We thank Professor P. Ghaliongui, Chief of the Department of Medicine, Ein-Shams University Hospital, for suggesting that the paper should be written and for his continued interest during its preparation. Thanks are due to Mr. H. Munib for reading the manuscript.

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MUCORMYCOSIS OF HEAD AND NECK STRUCTURES

A CASE WITH SURVIVAL

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It is only during the past few years that reports of disease in man caused by the fungus *Mucor* have begun to multiply. Since the report by Graham (1890) only two reports of visceral involvement by this fungus have been published in the British literature (Kurrein, 1954; Muresan, 1960). That the condition is not very rare is shown by the report of Neame and Rayner (1960), who found mucormycosis in 0.68% of all necropsies in a Durban hospital during a period of 10 months. Mucormycosis refers to infection by fungi of the order Mucorales, class Phycomycetes. These are ubiquitous saprophytes and are found on decaying vegetable matter, in soil, or as bread moulds (Conant *et al.*, 1954). In man the disease has usually been due to one of three genera of the Mucorales: *Rhizopus*, *Mucor*, or *Absidia*. The literature has been reviewed by a number of authors (Hutter, 1959; McBride *et al.*, 1960; Neame and Rayner, 1960).

The following case diagnosed during life appears to be the ninth reported case of cerebral mucormycosis with survival (Hutter, 1959; Dwyer and Changus, 1958).

Case History

The patient was a 60-year-old Jew, born in Iraq. His illness started one week before admission, with fever, pains in the right frontal and auricular region, and rhinitis. He was treated with antibiotics and admitted to hospital because of the appearance of chemosis and marked oedema of both eyelids on the right.

On examination an acute ethmoiditis was found and external ethmoidotomy was at once performed. A small quantity of pus was evacuated and the ethmoidal sinus drained. Fundoscopy at this stage was normal. On the second post-operative day the patient became somnolent, and a left hemiplegia and right internal and external ophthalmoplegia with proptosis became apparent. He was stuporose, reacting only to forceful stimuli. There was neck stiffness. His temperature was 38° C., pulse 88, blood-pressure 130/80.

The right eye was bulging forward and outward. There was marked swelling of the conjunctiva, eyelids, and surrounding tissues (Fig. 1). Many small pustules were seen on the skin surrounding the eye. The base of the drainage wound was grey and necrotic. There was a purulent retronasal discharge. The left eye was normal but deviated to the right. Carotid pulsation was present bilaterally. No arterial bruits were noted. The rest of the physical examination was negative.

Laboratory Findings.—Haemoglobin 13.6 g./100 ml.; leucocytes 32,500, with a marked shift to the left. Urine: acetone+, sugar 2.8%, albumin+, 2-8 leucocytes per field.

Blood sugar 348 mg./100 ml. Urea 32 mg./100 ml. Serum electrolytes and serum proteins were normal. Serological studies were negative. Repeated blood cultures were negative for bacteria. *Staphylococcus albus* was repeatedly isolated from the sinus discharge. Chest and skull radiographs were normal. There was increased density and cloudiness of the right ethmoid and maxillary sinuses.

FIG. 1.—Picture taken three weeks after admission, showing proptosis, swelling, and ptosis on the right. These were much more pronounced on admission. Note the left facial weakness.

In the electroencephalogram waves of low voltage at a frequency of 3–5 a minute were present in the right leads. On the left there was general irregularity. Lumbar puncture showed normal pressure, granulocytes 250/c.mm., Pandy+, proteins 50 mg./100 ml., sugar 181 mg./100 ml.; culture was negative.

Acute ethmoiditis with retrobulbar cellulitis, cavernous sinus thrombosis, diabetic acidosis, and cerebral artery

thrombosis were diagnosed. Treatment was as follows: the diabetic acidosis was rapidly adjusted with insulin, saline, and lactate; diphenadione was given, the prothrombin level being held constantly below 30% (Quick method), and he received penicillin 8×10^6 units, streptomycin 2 g., and kanamycin 1 g. daily.

During the next three weeks his general condition improved slowly. A low-grade fever persisted. The orbital swelling diminished. He regained consciousness and was able to speak. No improvement was noted in his neurological condition. Fundoscopy now suggested occlusion of the ophthalmic artery with optic-nerve atrophy. To rule out a right cerebral abscess a right carotid arteriography was performed. Complete obstruction of the internal carotid artery 0.5 cm. above the bifurcation was demonstrated.

The association of diabetic acidosis with periorbital cellulitis and sinusitis, meningitis, and internal carotid thrombosis suggested a search for mucorales, and these were found in scrapings from the right ethmoid sinus. Treatment with griseofulvin 1.5 g. daily was started, being continued for two weeks. The result of sensitivity tests prompted us to change to nystatin 500,000 units daily. The fever subsided on the day the griseofulvin was started. Potassium iodide was administered in large dosage. He improved slowly during the fourth to the tenth week; the sensorium cleared, the neck stiffness disappeared, and the diabetes was controlled by diet alone.

Repeat lumbar puncture showed marked improvement with normal protein and only 20 cells/c.mm. No moulds were cultured from the C.S.F. Numerous bedsores required vigorous supporting and nursing care but gradually healed.

He was discharged five and a half months after admission. There were weak voluntary movements of the left leg. He was able to walk with assistance. The proptosis had receded, the ophthalmoplegia and amaurosis remaining. Euphoria and indifference suggested frontal-lobe involvement.

Mycological Examinations.—The non-septated mycelium detected microscopically in the material obtained from the right ethmoidal sinus suggested the presence of a fungus belonging to the Mucorales. Cultures were made on Sabouraud dextrose agar and potato dextrose agar, both at

28° C. and at 37° C. All yielded a fungus resembling *Rhizopus*, which on subcultures filled Petri dishes in 48 hours with an abundant growth of a greyish mycelium dotted with innumerable black sporangia. This strain was later classified by Dr. C. W. Hesseltine as *Rhizopus arrhizus* (Fig. 2). It is deposited in the Agricultural Research Service Culture Collection as A-10236. *In vitro* the fungus proved to be resistant to griseofulvin but sensitive to as little as 0.5 unit of nystatin/ml. Material obtained subsequently from the ethmoid sinus proved to be negative both on microscopical examination and on culture. Three blood cultures were negative for fungi.

Immunological Examinations.—The fungus was grown on Capek medium for two weeks. The mycelium was removed and washed repeatedly with sterile saline, ground in a mortar, and autoclaved in saline in a dilution of 1/30. The intradermal injection of 0.1 ml. of a clear filtrate of this extract into the patient produced an erythema of 15 mm. diameter, while no reaction was seen in control subjects. No reaction was produced by intradermal injection of extracts of *Penicillium*, *Alternaria*, and *Aspergillus*. When this extract was used as antigen in a complement-fixation test against the patient's serum a positive result in a titre of 1/80 was obtained. Sera from control subjects were completely negative.

Discussion

This case illustrates many important aspects of mucormycosis. With the exception of mucormycosis of the skin all cases have been associated with a predisposing illness. Diabetes, not always severe, has often been present, and appears to be the most important predisposing factor in cerebral mucormycosis in adults (Bauer *et al.*, 1955; Smith and Yanagisawa, 1959; Dwyer and Changus, 1958). Other predisposing debilitating states are uraemia, tuberculosis, leukaemia, malignant diseases, and chronic malnutrition, especially kwashiorkor (Neame and Rayner, 1960).

The spread of the mould, once the resistance of the host has been broken down, is characterized by the extraordinary facility with which it will invade blood-vessels, growing rapidly and abundantly along their course, causing thrombosis ("mucor thrombosis") and infarction of surrounding tissues (Martin *et al.*, 1954; Bauer *et al.*, 1955; McBride *et al.*, 1960). The three regions most

FIG. 2.—*Rhizopus arrhizus* from a culture, showing sporangio-phores bearing spherical sporangia. ($\times 100$.)

frequently involved are the head and neck structures, lungs, and gastro-intestinal tract. Only in the first, however, has a definite and pathognomonic clinical syndrome been recognized (Bauer *et al.*, 1955; Baker, 1957; McCall and Strobos, 1957; Dwyer and Changus, 1958; Hutter, 1959), while, in the latter two, signs and symptoms related to mucormycosis are obscured by the underlying disease.

After sinusitis the mucor spreads to surrounding tissues, especially the periorbital tissue, causing thrombosis of the retinal artery, complete ophthalmoplegia, and blindness. Further spread causes meningitis and involvement of the ophthalmic and carotid artery with thrombosis of these vessels.

This case clearly demonstrates the typical syndrome, especially the triad of uncontrolled diabetes, unilateral periorbital infection, and meningoencephalitis. The case reports in the literature of mucorales involving head and neck structures show very similar features (Smith and Yanagisawa, 1959). Diagnosis of mucormycosis of the head should therefore present little difficulty if one is acquainted with the typical features of this syndrome, and it can readily be confirmed by mycological examinations.

In our patient we could demonstrate specific intradermal reactions with autoclaved culture extracts, and a positive complement-fixation test was obtained when this extract was used as antigen. If the numerous species belonging to the Mucorales have a common antigen, immunological tests of the kind described could be of value in cases of suspected mucormycosis, where isolation of the causative organism is difficult or impossible.

Prognosis and Treatment

The prognosis in the visceral forms appears to be uniformly poor. Survival from mucormycosis involving the head and neck structures has been the exception rather than the rule.

Hutter (1959) found only 7 survivals in 24 cases of cerebral mucormycosis. In the pulmonary and gastro-intestinal cases survival has been rarer still. Possibly awareness and earlier recognition will improve the outlook in the future.

No specific therapeutic agent against the fungus is known. Amphotericin B has recently been thought to be of value (McBride *et al.*, 1960). We doubt whether griseofulvin had any effect in our case, nor are we convinced that nystatin was of value, although *in vitro* the fungus was very sensitive to it. However, nystatin is not absorbed from the gastro-intestinal tract and therefore is unlikely to affect remote fungi.

Anticoagulant therapy may have prevented further extension of thrombotic lesions and is probably worth a trial if there are no contraindications to its use. Probably of much greater importance is the early management of the diabetes and other predisposing diseases and the supporting treatment of the severely ill patient.

Summary

A case of mucormycosis involving head and neck structures has been described. The rather typical clinical picture has been stressed. A specific intradermal reaction and a positive complement-fixation test were demonstrated.

We are indebted to Dr. C. W. Hesseltine, Agriculture Research Service, Peoria, Illinois, for classification of the culture.

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CASE OF HOMOSEXUALITY TREATED BY AVERSION THERAPY

BY

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Hadfield (1958), in an interesting paper on the cure of homosexuality, defines "cure" as meaning that the patient "loses his propensity to his own sex and has his sexual interests directed towards those of the opposite sex, so that he becomes in all respects a sexually normal person." He quotes the Wolfenden report—"none of our medical witnesses were able, when we saw them, to provide any reference in medical literature to a complete change of this kind." He further maintained that the process of cure was a long one, and that the main benefit of investigating cases of homosexuality is that the cause of the condition may be ascertained and that means of prevention may be found.

The report by Curran and Parr (1957) of a series of 100 homosexuals seen in private practice, in which those patients treated psychotherapeutically derived no apparent benefit in terms of changed sexual preference or behaviour as compared with those matched patients not so treated, adds to the feeling of therapeutic impotence which the practitioner so often feels when faced with the problem of homosexuality.

A special Committee of the Council of the B.M.A. (1955), in a memorandum on homosexuality and prostitution, laid stress on the need for research into the treatment of homosexuals.

The case here reported is thought to be of special interest in that to some extent the patient acts as his own control as previous methods of treatment had been unsuccessful.

Case Report

Male, single, aged 40 years. Mother alive and well. Father, who had been married before, died of cancer when patient was aged 16. There is one half-sister and one half-brother.

His homosexual drive was first apparent at the age of 15, and his first homosexual experience was at 18. Since then he had been exclusively homosexual, girls having no physical attraction whatever, physical contact with them inducing