cytopenia a delay between courses was often necessary. Radiotherapy was never given. She did not achieve remission. In November 1983, 23% of the peripheral blood white cells were blast forms, which displayed a poorly differentiated morphology with irregular outlined nuclei and a conspicuous nucleolus. Primary granules and Auer rods were not seen. Bone marrow aspirate confirmed the diagnosis of acute leukaemia. The peroxidase reaction was positive in 46% of the blast cells. Twenty two percent of the cells expressed myeloid markers ($OKM1^+$) while 30% had a common acute lymphoblastic leukaemia phenotype (TdT^+, $J5^+$). The simultaneous expression of two different types of antigen on the same cell was excluded by a double labelling technique.

Treatment with a cycle of chemotherapy including Ara-C and daunorubicin failed to produce a remission and the patient died of severe granulocytopenia and sepsis resistant to antibiotic treatment.

Immunological markers are a valuable tool in the characterisation of these cell proliferations and the use of a large panel of such markers may indicate that mixed leukaemias are more common than is at present realised. For example, in a recent analysis of patients with chronic granulocytic leukaemia in acute transformation[6] we estimated that 24% had blast cell populations of more than one lineage. We therefore suggest in these cases, as well as in mixed leukaemia secondary to chemotherapy, that the target cell for malignant transformation could be a pluripotent stem cell.

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Serum creatine kinase isoenzyme levels in patients with cerebral tumours

Creatine kinase BB (CK-BB) isoenzyme is found in large quantities in brain tissue. Raised levels have been detected in the serum and cerebrospinal fluid of patients with a variety of neurological conditions.[1–5] Until now there has been no systematic study of patients with cerebral tumours.

Serum CK-BB was estimated in 34 consecutive inpatients with computed tomographic evidence of neoplasia by Dr RJ Thompson using a radioimmunoassay method described elsewhere.[4] Solitary lesions were either biopsied (18) or resected (5). Multiple lesions or intracranial masses in patients with known malignancy (8) were assumed to be secondary deposits and therefore not biopsied. The remaining three comprised one colloid cyst, carcinomatous meningitis, and a patient whose scan was highly suggestive of an astrocytoma but who declined biopsy. The astrocytomas were graded histologically as well differentiated/low grade (4), intermediate grade (2), or anaplastic (3); the patient who declined biopsy was classed "intermediate" based on radiological appearance and clinical course. Biopsies from two further astrocytomas were inadequate for histological grading.

The serum CK-BB levels and corresponding diagnoses are given in the Table. Of 31 patients with cerebral tumours, only four had raised levels.[3] These four included all three anaplastic astrocytomas and a patient with two large metastases from a bronchial carcinoma. The levels were significantly greater for anaplastic astrocytomas than for other astrocytomas or other tumour types ($p < 0.01$ and $p < 0.001$, respectively; Mann-Whitney U test).

Although all anaplastic astrocytomas gave raised CK-BB levels, the increase was small. Systemic malignancy often gives high levels,[6] and yet only one patient with secondaries in the brain gave a (marginally) raised result. Lack of raised values in non-invasive tumours is in keeping with recent studies[7] showing that the rise is related to acuteness and extent of brain injury. Further studies may confirm whether the isoenzyme is useful clinically in distinguishing types of cerebral tumours.

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Diagnoses with corresponding CK-BB level

Diagnosis	*No studied*	*CK-BB (μg/l) (normal <3 μg/l)*
Astrocytoma		
Anaplastic	3	3·2, 3·7, 5·0
Intermediate	3	0·3, 0·4 (see text)
Low grade	4	0·3, 0·3, 0·4, 1·6
Unclassified	2	0·4, 0·4
Meningioma	3	0·3, 0·4, 0·8
Metastasis	9	Range 0·01–3·1
Colloid cyst	1	0·4
Acoustic neuroma	1	0·01
Haemangiopericytoma	1	2·4
Oligodendroglioma	1	0·5
Pituitary tumour	1	0·9
Cerebral lymphoma	1	1·4
Carcinomatous meningitis	1	1·8
Infarction	3	0·1, 0·5, 0·5
Total	34	

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Difficulties in the diagnosis of acquired immune deficiency syndrome

Diagnosis of the acquired immune deficiency syndrome (AIDS) requires reliable evidence that an opportunistic infection or immunodeficiency related tumour is present with an acquired impairment of T cell function, usually first indicated by lymphopenia. Following the report by Dr Burt and others[1] we would like to present our experience with a similar patient who fulfilled the diagnostic criteria of AIDS.[2] In this patient the presence of opportunistic disease, although suspected, was not reliably identified during life despite extensive microbiological, radiological, and histological evaluation. In addition, lymphopenia and T cell lymphopenia never developed, although a considerable reduction in the proportion of T helper cells and increase in T suppressor cells, with a consequent reduction in the T helper to T suppressor cell ratio, was present, together with skin test anergy.

A 45 year old promiscuous male homosexual, presented with a one month history of malaise, anorexia, loss of weight, a dry cough, and night sweats. Medical history and clinical examination were unremarkable. Abnormal investigations included an erythrocyte sedimentation rate of 135, hypergammaglobulinaemia, a reversed T helper to T suppressor ratio, a decreased percentage of T helper cells, an increased percentage of T suppressor cells, and bilateral pulmonary infiltrates. Absolute numbers of lymphocytes and T lymphocytes remained normal throughout his illness and extensive investigation failed to reveal any evidence of infection or malignancy. Over a five month period. no appreciable IgG antibody titres were found to several antigens, including cytomegalovirus, herpes simplex, *Toxoplasma gondii,* and *Pneumocystis carinii.* Histological examination of liver and bone marrow were normal and, although a transbronchial biopsy raised the suspicion of pneumocystis pneumonia, organisms were not shown.

Co-trimoxazole was given without noticeable benefit and was discontinued because of the development of a maculopapular rash. Empirical antituberculosis treatment was then started with rifampicin, isoniazid, and ethambutol; this resulted in some improvement, which was sustained over the next three months.

His symptoms and lung infiltration then returned, and despite further courses of co-trimoxazole and antifungal therapy he died. Again, investigations had not provided any conclusive evidence of opportunistic infection. Needle specimens of lung, heart, and liver were obtained at a limited necropsy. The lung biopsy was characteristic of *P carinii.*

Until we have a diagnostic test for AIDS (such as that recently proposed[3]), emphasis is placed on characteristic but non-specific laboratory features. Lymphopenia, particularly T cell lymphopenia, is a typical finding in adult patients with AIDS[4,5]; more severe disease is associated with lower absolute lymphocyte counts and lower T helper to T suppresor ratios.[5] This patient was unusual in having normal absolute lymphocyte and T lymphocyte counts which failed to reflect his underlying immunological state, with a considerably decreased proportion of T helper cells (OKT4), increased proportion of T suppressor cells (OKT8), and a severely reduced T helper to T suppressor ratio of 0·15 (normal 1·0–3·0). This underlines the importance of determinations of T lymphocyte subsets in these patients.

The lack of any appreciable antibody titres was also unusual as high levels of IgG antibody to herpes viruses are commonly seen in homosexual males with AIDS.[6,7] Tissue destructive infections can occur, however, without producing a rise in IgG antibody[1] and without specific IgM production.[6,8] Meaningful interpretation of serological results may therefore be impossible. Where feasible, culture of the organism from a normally sterile site, tissue identification, or tests for antigen are more appropriate in the diagnosis of current infection.

Despite the initial response to antituberculosis treatment, we believe that mycobacterial infection was unlikely as repeated attempts at isolation before and after death were unsuccessful. It is possible that rifampicin displayed some in vivo activity against pneumocystis pneumonia; serologically diagnosed infection which responded to rifampicin has been described.[9] Animal experiments, however, have found rifampicin to be ineffective in the prophylaxis and treatment of *P carinii* infections,[10] while it may further suppress the immune response.[11]

As with the case described by Dr Burt and others[1] this report exemplifies some of the difficulties that may be encountered in diagnosing AIDS.

We are grateful to Dr M Serlin and Dr FJ Nye for permission to report this patient who was under their care.

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Since this letter was written we have received a report on the immunofluorescent test for antibody to HTLV III virus, which was positive. (We are grateful to Dr MS Pereira, Virus Reference Laboratory, Central Public Health Laboratory, Colindale, London, for this result.)

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