Editorial

Neuro-oncology at the Crossroads

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The notion of a tumour in the brain is a most terrifying prospect for most individuals and many physicians. Yet brain tumour is the second most common form of malignancy in childhood, and accounts for the 3rd or 4th most frequent cause of cancer death among middle-aged adults. More optimal control of primary malignancies has also contributed to a phenomenal increase in the incidence of metastatic brain tumours. The advent of AIDS has also contributed to the rise in lymphoma of the central nervous system (CNS).

The field of neuro-oncology could not have progressed without concomitant advances in the field of neuro-imaging, neuroanaesthesia, surgical techniques, radiation therapeutics and neuro-oncology.

There have been great strides in neuroradiological techniques in functional and metabolic imaging of brain tumours. The functional imaging techniques of positron emission tomography (PET), single photon emission computed tomography (SPECT) and magnetic resonance spectroscopy (MRS) are able to quantify various aspects of brain tumour metabolism. Information regarding tumour blood flow, tumour growth rate, degree of oxygenation, pH, and chemical composition, such as lactate (Lac), choline (Cho), N-acetylaspartate (NAA), phosphocreatine (PCr), creatine (Cr) and lipids (Lip) can be now obtained.[1]

Awake anaesthetic and surgical techniques now allow safer and more radical surgery for tumours located in the eloquent cortex, that were previously either managed expectantly or only offered a biopsy for histological diagnosis.[2,3]

Adjuvant therapies after surgical resection often include radiation therapy and chemotherapy. Better radiation therapy techniques now permit the delivery of effective doses of radiation with reduced neurotoxicity.[4] The chemotherapeutic armamentarium now includes more drugs capable of crossing the blood brain barrier to reach effective concentrations. The role of chemotherapy as part of upfront treatment for newly diagnosed glioblastoma (astrocytoma), the commonest and most aggressive malignant primary brain tumour in adults, has been established in randomised controlled trials. For other types of gliomas, patients and doctors will benefit from the new data and clarification on the role of chemotherapy for newly diagnosed tumours obtained from recently completed clinical trials. When gliomas recur, carefully selected additional interventions can help preserve physical and cognitive functions. This issue includes timely updates of these developments.[5,6]

It is clear that there is better overall patient satisfaction and possibly better patient outcomes when patients are treated in a multidisciplinary setting. Few other disciplines demonstrate this philosophy more convincingly than the neuro-oncology model. Back et al[7] have certainly demonstrated in this issue that a holistic multi-disciplinary approach can produce superior patient care at all levels.

There is no controversy that the most radical advances in the field of neuro-oncology are now taking place in the molecular realm. Carcinogenesis is a complex interplay of aberrant signalling pathways resulting from of ligand-receptor interactions that induce tumour proliferation and cellular migration, promote angiogenesis, inhibit apoptosis, and confer cellular survival and chemoresistance. The concept of a cancer stem cell with an intrinsic capacity for unlimited self-renewal and the ability to initiate and drive tumour progression is now challenging the traditional concept of cancer homogeneity.[8] These advances in molecular biology leave no doubt that the future battles of neuro-oncology will not be fought at the bedside or operating room but in the laboratory.

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