The YEAR BOOK of
Cancer
1979

Compiled and Edited by
RANDOLPH LEE CLARK
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Introduction

The 282 articles abstracted in this 1979 YEAR BOOK OF CANCER represent, in the opinion of our 164-member editorial board, the most informative that have been written about the causes, prevention, detection, and treatment of cancer in the past year. They were chosen from an enormous bibliography—over 25,000 articles— and if space and time permitted, the hundreds of articles listed as additional reading could profitably have been abstracted as well.

As in the past, early detection is still the best defense against cancer mortality, yet the controversy over screening for breast cancer, for example, has generated much confusion in the minds of cancer patients and physicians alike. There has been a marked increase in both professional and public awareness of the need to balance the benefits of screening with its risks and costs. As numerous abstracts in this volume make clear, progress in scintigraphy, ultrasonography, mammography, and estrogen receptor concentration is proceeding at a rapid pace, and future improvements in detection techniques should clarify the optimum design and application of breast cancer screening programs.

The usefulness of computerized axial tomography for both diagnosis and follow-up studies of patients with cancer is the subject of numerous reports. The "CAT" scanner has proved to be a truly ingenious tool and several authors report on subtleties of interpretation that add to the effective treatment of the cancer patient.

Studies of molecular genetic factors and their significance to detection, diagnosis, therapeutic orientation, prognosis, and high-risk factors are increasing in the current literature. These reports expand the concepts of viral interaction with gene characteristics and mechanisms, frequently interrelated to DNA and its reverse reactions in cellular abnormalities and replication. Other reports show an increasing interest in diet and nutrition, radiation sensitizers, hormone receptors, cancer prevention, and multimodal therapy for both primary and secondary tumors of the neurologic system. This latter development foretells the possibility of neuro-oncology becoming a reality.

Another area in which progress is being made is immunotherapy. Studies of active specific intralymphatic immunotherapy, the interaction of chemotherapy with bacillus Calmette-Guérin (BCG) and *Corynebacterium parvum,* immune RNA therapy, and chemoimmunotherapy as a prophylaxis for metastases appear promising. Two articles in this volume report on the action of interferon, an immunotherapeutic agent that holds great promise for the treatment of cancer.

Of growing concern to oncologists and other physicians is the impact of environmental carcinogens on exposed populations. Accordingly, this YEAR BOOK edition includes a new chapter on carcinogenesis that,

together with the chapter on epidemiology that precedes it, reflects this mounting problem. Researchers report on the development of a reproducible, quantitative focus assay for the transformation of Syrian hamster cells by chemical carcinogens, mutagenic substances as possible factors in senility, and the relative sensitivity of forward and reverse mutation assays in *Salmonella typhimurium* strains, the primary bacteria used in the much-publicized Ames test. Studies in epidemiology reflect the importance of exposure to asbestos in lung cancer and to solar radiation in melanoma. Another study examines the effects of pollution on rural populations that migrate to urban areas, and one author addresses himself to a new concern, malignancies associated with immunosuppressive or cytotoxic cancer therapy. It is indeed ironic that the most potent weapons in our battle against cancer are themselves often dangerously carcinogenic, and much research needs to be done before we can begin to solve this increasingly thorny problem.

Perhaps the greatest strides in cancer therapy in the past few years have been in the area of pediatric oncology, where diseases such as leukemia and lymphoma, that meant certain death only 2 decades ago, now show rates of complete maintainable remissions and survival that approach cure. Also, treatment for childhood osteogenic sarcoma continues to produce increasingly better survival rates, according to various reports. Still, problems remain, and authors in this volume report on the effects of central nervous system irradiation on the intelligence of children, professional and family perspectives on home care for the dying child, and the prevalence of *Pneumocystis carinii* infection in immunosuppressed children. Only through continued vigorous investigation of these matters will solutions be found.

Of particular interest for future studies is the report concerning hydatidiform moles. This study gave evidence that the complete hydatidiform mole is of androgenic origin. Another promising area for future study is the report that, after revascularization by microsurgery, periosteal grafts appear to have the potential to produce new bone without bone grafting for facial defects. This could begin a new era in rehabilitation following mutilative surgery for bone-invading malignancies.

It is not possible to comment on all the articles in this YEAR BOOK OF CANCER in the short space allotted to this introduction. Suffice it to say that in the following pages the physician will find increasing evidence not only of the great problems that stretch before us, but also of the great progress we have made in overcoming those same problems. If it seems, at times, that we uncover a host of new dilemmas each time we solve one, a moment's reflection will show that cancer patients are now living longer and with more hope than ever before, and the word "cure" is no longer absent from the oncologist's vocabulary. The credit for these results belongs to those who actively pursue the battle against cancer, and it is to them that mankind owes a debt that can never be repaid.

R.L.C.
R.W.C.
R.C.H.

Acknowledgments

Over 500 persons throughout the world were involved in the preparation of this 23d volume of the YEAR BOOK OF CANCER, and without their cheerful, erudite assistance this book would have been impossible to compile. Members of the editorial board review the literature for their respective specialties and select the most significant articles for abstraction. The authors of selected articles are then invited to prepare abstracts, provide illustrations as needed, and often prepare addenda to update their information.

Members of the staff of The University of Texas System Cancer Center M. D. Anderson Hospital and Tumor Institute give generously of their time and expertise throughout this process. Marion Stringer and her assistants in the Research Medical Library and Judy McConathy in the Department of Biomathematics compile the bibliographies from which most of the selections are drawn. The manuscript is prepared for publication in the Publications Office of the Department of Information and Publications. Diane Culhane and Douglas Rowlett served jointly as managing editors for this volume, and Suzanne Brauer, Bette Cohen, and Dorothy Kisling kept up with the voluminous correspondence and typed the hundreds of pages that made up the manuscript.

All of these people have duties other than those involved in preparing this volume, but they cheerfully complied with our tight schedule in the hope that their efforts will enable the fight against cancer to progress at a rapid pace. To them all, we express our heartfelt appreciation and sincere gratitude. As in the past, we once again wish to acknowledge the continuing support of the William Heuermann Fund, which makes this publication possible.

R.L.C.
R.W.C.
R.C.H.

Brain and Nervous System

Evaluation of BCNU and/or Radiotherapy in the Treatment of Anaplastic Gliomas: A Cooperative Clinical Trial. Michael D. Walker, Eben Alexander, Jr., William E. Hunt, Collin S. MacCarthy, M. Stephen Mahaley, Jr., John Mealey, Jr., Horace A. Norrell, Guy Owens, Joseph Ransohoff, Charles B. Wilson, Edmund A. Gehan, and Thomas A. Strike[1] (Natl. Cancer Inst.) report on a controlled prospective randomized study that evaluated the use of BCNU and/or radiotherapy in the treatment of patients who had histologic confirmation of anaplastic glioma. A total of 303 patients were randomized into the study, of whom 222 (73%) were within the valid study group (VSG), having met the protocol criteria of neuropathology, corticosteroid control, and treatment. Patients were randomized into four groups and received either BCNU (80 mg/m^2/day on 3 successive days every 6–8 weeks), and /or radiotherapy (5000–6000 rad whole brain irradiation through bilateral opposing ports), or best conventional care without chemotherapy or radiotherapy. Analysis was performed on all patients conforming to protocol requirements who received any therapy (VSG) and on the adequately treated group (ATG), who had received at least 5000 rad radiotherapy and two or more courses of chemotherapy and had a minimum survival of 8 weeks.

Median survival of patients in the VSG was as follows: best conventional care, 14 weeks; BCNU, 18.5 weeks; radiotherapy, 35 weeks; and BCNU plus radiotherapy, 34.5 weeks. However, in the ATG, median survival of patients was as follows: best conventional care, 17 weeks; BCNU, 25.0 weeks; radiotherapy, 37.5 weeks; and BCNU plus radiotherapy, 40.5 weeks. All therapeutic modalities showed statistical superiority over best conventional care. There was no significant difference between the four groups in relation to age distribution, sex, location of tumor, diagnosis, tumor characteristics, signs or symptoms, or amount of corticosteroid used. An analysis of prognostic factors indicates the initial performance status (Karnofsky rating), age, incidence of surgical biopsy, parietal location, presence of seizures, and involvement of cranial nerves II, III, IV, and VI were all of significance. Toxicity included acceptable reversible thrombocytopenia and leukopenia. This study has clearly demonstrated the efficacy of BCNU and radiotherapy as single agents, and ongoing studies are reexamining their use in combination.

► [This major controlled, prospective, randomized study of BCNU and/or irradiation for histologically confirmed anaplastic gliomas has finally been reported. The role of irradiation was clearly demonstrated by an approximate 150% increase in median survival over patients receiving best conventional care. Despite the fact that median sur-

(1) J. Neurosurg. 49:333–343, September 1978.

vival with BCNU and irradiation was not statistically better than that with irradiation alone, more patients survived (approximately 19% irradiation and BCNU vs. 4% irradiation alone) at 18 months in the combined-therapy groups. – Eds.] ◄

The Dilemma of Childhood Optic Gliomas. Donald C. Oxenhandler and Martin P. Sayers[2] (Ohio State Univ. Hosp.) point out that the management of childhood optic gliomas remains controversial. Advocates of various combinations of surgery, simple observation, irradiation, and steroid therapy retain their various positions. This article reviews the collective experience with 28 cases of childhood optic gliomas at the Columbus Children's Hospital. In summarizing their personal experience and the literature since the turn of the century, the authors arrive at no clear approach to treating these neoplasms.

The optic glioma is part of the group of basically midline pilocytic childhood gliomas and represents a true neoplastic entity. The natural history of the tumor, however, remains problematic. Although tumor progression and death in the absence of hydrocephalus, or with treated hydrocephalus, are well documented, the multidecade progression of such a benign tumor is also well described. Death resulting from optic gliomas involves either tumor infiltration, untreated hydrocephalus, hemorrhage into the tumor, or (rarely) malignant degeneration. Previous reports have emphasized the more ominous prognosis of more posteriorly placed tumors. This would appear to be due to the earlier involvement of vital structures, rather than a change in the cytologic makeup of the tumor. The more anteriorly placed tumors appear to have more room to grow before involving vital neurologic structures. Malignant degeneration is a rare complication of childhood optic gliomas and is more well known in adult optic gliomas. Hydrocephalus in this series was not associated with the ominous prognosis previously described.

Rapid changes in visual morbidity are well documented in the literature. Mucinous pathologic changes within the tumor itself are typically well described, but their relation to a dynamic sudden change in visual function is unclear. Spontaneous clinical improvement in visual function is also well described, and this obscures analysis of follow-up treatment data.

After this literature review, the treatment of optic gliomas was pragmatically approached from an anatomical standpoint involving the therapy of unilateral optic nerve gliomas and the therapy of those with chiasmal or more extensive posterior involvement.

In the management of unilateral optic nerve gliomas, those children with good vision and little or no proptosis present a further therapeutic problem. With a conservative nonsurgical treatment regimen, these patients would require meticulous neuro-ophthalmologic follow-up. Age is certainly a factor, as perimetry and reliable acuities are often impossible to determine in the young child. Surgical resection should be considered in the young patient in whom follow-up examination is unreliable, unilateral visual loss profound, or proptosis excessive. An orbital resection would first require radiologic proof of lack of chiasmal involvement.

(2) J. Neurosurg. 48:34–41, January 1978.