Brain Tumors of Childhood

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To keep a book brief and yet provide all of the essential information is much more difficult than to be encyclopedic, but this the authors have succeeded in doing. With few wasted words Drs. Cuneo and Rand evaluate the results of treatment of 83 cases of brain tumors in children. The study covers a ten-year period at the Children's Hospital in Los Angeles.

- Just enough individual case reports (very few)
- The data is concise, easy to assimilate
- The subject matter is condensed (no attempt is made to bore the reader with non-essentials)

General symptomatology, differential diagnosis, and mechanical diagnostic aids (ventriculography, electro-encephalography, and angiography) are considered in a special chapter.

Each chapter is prefaced with a 100 to 200 word quotation from the writings of various master neurosurgeons. Some are by Harvey Cushing, Percival Bailey, Franc D. Ingraham, and H. William Scott, while others are by Gilbert Horrax, Edgar F. Fincher, Gaylord P. Coon, Walter E. Dandy, Douglas N. Buchanan, Paul C. Bucy, Louis Lichtenstein, Henry L. Jaffe.

73 SUPERIOR ILLUSTRATIONS: Each chosen as the best available to show a particular lesion, certain pathology (the photomicrographs are excellent).

222 pages 73 illustrations

American Lecture Series

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BRAIN TUMORS OF CHILDHOOD

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DEDICATED

To the Memory of

MAX MINOR PEET

October 20, 1885 - March 25, 1949

and

COBB PILCHER

October 7, 1904 - September 22, 1949

"Surgical judgment, indeed, is a more or less inspirational quality which is variable, and elusive, all surgeons being conscious of having it in hand on some occasions, of losing it on others. . . . The surgery of brain tumors may be likened without being trivial to a form of major sport which is played against an invisible but utterly relentless antagonist quick to take advantage of every misplay and faulty move. And when the time comes to make public one's score, it is done somewhat apologetically, but with the expectation that others may profit by it and with the assurance they will come to improve upon it." From Harvey Cushing: Experiences with the Cerebellar Astrocytomas. *Surg. Gynec. and Obst., 52:*129-191, 1931.

Preface

IT IS GENERALLY considered to be a salutary, although sometimes an embarrassing experience, to publicly review one's results in any clinic. Such has been the authors' lot in going over the cases of brain tumor treated at the Children's Hospital in Los Angeles during the last decade. During this period, 83 verified cases of brain tumor and/or granulomatous lesions resembling tumor were encountered. They fell into the following categories:

1.	Astrocytoma	26 cases—31.33%
2.	Medulloblastoma	22 cases—26.51
3.	Craniopharyngioma	9 cases—10.84
4.	Ependymoma	6 cases— 7.23
5.	Pinealoma	3 cases— 3.61
6.	Papilloma of Choroid Plexus	3 cases— 3.61
7.	Glioblastoma (Spongioblastoma) Multiforme	3 cases— 3.61
8.	Meningioma	2 cases— 2.41
9.	Glioma of Optic Nerve	1 case — 1.20
10.	Malignant Metastatic Tumors	2 cases— 2.41
11.	Eosinophilic Granuloma	3 cases— 3.61
12.	Infectious Granulomata	
	(a) Tuberculoma	1 case — 1.20
	(b) Neuroblastoma (Actinomycosis)	1 case — 1.20
	(c) Coccidioides	1 case — 1.20
		99.97

If the subject matter is considered from the standpoint of diagnosis and treatment, one fact becomes immediately evident. Our diagnostic ability, enhanced by the mechanical aids of ventriculography, electro-encephalography and angiogra-

phy, far exceeds our surgical ability to cure. We have been disappointed by the high percentage of surgical failures in the treatment of these conditions. Aside from some gratifying results in children with cystic astrocytomas, eosinophilic granulomas, and an occasional fortunate outcome in the handling of craniopharyngiomas, the end results from the standpoint of permanent restoration of health have failed of expectation.

While we have been disappointed in our results, we find that others dealing with brain tumors of children, likewise, have had reason to be depressed. As Bailey, Buchanan, and Bucy have so aptly expressed it in the closing sentence of their excellent monograph, entitled *Intracranial Tumors of Infancy and Childhood,* "When we feel depressed we get back the patients who had astrocytomas and look at them until our spirits rise and we are encouraged to continue the fight against this curse of mankind." Certainly, much improvement in the management of these lesions, be it surgical or otherwise, is needed to secure better results. Is it possible that therapy by some form of atomic energy may offer this in the future?

We wish, especially, to express our gratitude to our associates in the neurosurgical clinic, Doctors George H. Patterson and Frank M. Anderson, who have studied and operated upon many of the cases reviewed. Likewise, we are indebted to Doctor Ralph E. Knutti, in charge of the Pathological Laboratory, and his associate Doctor Hugh J. Plumb, for their patience and guidance in reviewing the pathological material, and for selecting suitable specimens for illustration. We would also extend our thanks to Doctor C. B. Courville, director of the Ramón y Cajal Laboratory for the privilege of using certain specimens for illustration. Miss Alice Scott

of this laboratory has likewise been most helpful in securing illustrative specimens for us. We are indebted to Mr. Deryl M. Davis, photographer at the Children's Hospital for his excellent cooperation in furnishing most of our illustrations. Doctor Rolla G. Karshner aand Mrs. Dorothy W. Ingersoll of the X-Ray Department of the hospital have gone out of their way to help us. Our gratitude to Miss Ruth Landis, librarian, for pulling case records from dusty files, and to Mrs. Ora R. Sutphen, librarian, for her cooperation in a bibliographic way. And finally, our thanks to Mrs. Hilda M. Harris for her assistance in editing and correcting proof. We are deeply indebted to our publisher, Charles C Thomas, for his understanding helpfulness.

H.M.C.
C.W.R.

Contents

BRAIN TUMORS OF CHILDHOOD

Chapter One

Astrocytoma

"The cerebellar astrocytomata furnish another example of gliomatous tumors which, like the medulloblastomas, show predilection for a favorable site and produce a recognizable syndrome. The tumors are probably of congenital origin and usually date symptomatically from childhood. . . . They are signalized by periodic matutinal headache and vomiting. Owing to their mid-cerebellar situation, the tumors inevitably cause secondary hydrocephalus and this, in turn, leads to a choked disc which may be so insidious in origin that seriously impaired vision may be the first recorded symptom." From Harvey Cushing: Experiences with Cerebellar Astrocytomas. *Surg. Gynec. and Obst., 52*:129-191, 1931.

AMONG THE GLIOMA GROUP of tumors which affect the brain, the astrocytomas have come to be considered as the most benign. This is especially true of the cystic astrocytomas that occupy the cerebellum of children. A remarkable instance was reported by Hausman and Stevenson[1] of a survival period of 45 years in a patient with such a tumor. The initial symptoms started at the age of eight, death occurring at 53. The clinical course of the case consisted of irregular recurrences of occipital headaches and ataxia, interspersed with long periods of relief from symptoms. In summary, the authors state "the slow and interrupted symptomatic advance, with long intervals in which the patient was comparatively symptom-free, were typical of astrocytomas of the cerebellum"—adding, "the survival period of 45 years is the longest on record." Mention is made of this unique case because of the extraordinary period of survival, which

is far beyond what is naturally to be expected even in cases of cystic cerebellar astrocytomas.

"Gliomatous cysts" of the brain were known to exist many years before they were classified on a histogenetic basis by Bailey and Cushing[2] in 1926. They identified two types of astrocytes, the fibrillar and the protoplasmic, and named the tumors in which one of these types of cells predominated as fibrillary or protoplasmic astrocytomas. Bucy and Gustafson[3] corroborated their findings in a careful study of the nature of cerebellar astrocytomas. The cystic character of many of these tumors was emphasized by these writers. Scherer[4] further studied the character and cellular derivatives of the cerebral astrocytoma group of tumors. All writers agree that the astrocytomas are relatively benign and slow growing, and that the outlook for their removal is more encouraging than in any other form of glioma. This is especially true of the cystic cerebellar astrocytomas.

Svien, Mabon, Kernohan and Adson[5] have recently introduced a simplified concept of classifying tumors of the glioma group in which they grade astrocytomas from 1 to 4, depending upon their degree of malignancy. They have placed the astrocytoma—astroblastoma—glioblastoma multiforme complex of gliomas on the basis of differentiation rather than histogenesis, and have concluded that the astroblastoma and glioblastoma multiforme subgroups are but more malignant varieties of astrocytoma. This concept doubtless will furnish a basis for heated arguments among neuropathologists.

In 1931, Cushing[6] published his outstanding critical review of his experiences with 76 cerebellar astrocytomas. In this paper, he emphasized the fact that these tumors showed a predilection for a midcerebellar position. They may be either solid or cystic, and are composed of fibrillary or