

## Preface

The purpose of this book is to bring a new understanding to bear on the diagnosis of brain tumors by linking radiographic image characteristics to the underlying pathology.

Brain tumors are relatively uncommon compared with other neoplasms (e.g., lung, breast, gastrointestinal). They require special study, since they are pathologically complicated, difficult to diagnose, and account for high morbidity.

Although many excellent neuroradiological books have been written, few of them focus especially on the diagnosis of brain tumors. In this book, brain tumors are discussed in detail. Special emphasis is placed on CT and MRI findings in relation to the pathology of each tumor. As pathology is the “mother” of radiology, this approach may be the best way to understand in depth the imaging manifestations of brain tumors. The illustrative examples herein, were chosen on the basis of their clarity or complexity, their teachability, and their significance for diagnosis and treatment.

In the second edition of this book, all chapters have been revised and updated with new clinical information and new imaging material providing the scientists, interested in the field of Neuro-imaging and Neuro-oncology, with knowledge that will enhance their service to the patients.

The latest developments in the field of MRI, the tendency to move to higher MRI fields (3T), as well as the introduction in the clinical practice of advanced imaging techniques such as, diffusion, diffusion tensor imaging, perfusion, spectroscopy, and functional imaging represent the new tools in the hands of the neuroscientists to help them in the diagnosis, treatment, and follow-up of brain tumors.

The book includes 14 chapters. Chap. 1 deals with the epidemiology and classification of brain tumors. Chap. 2 discusses different imaging modalities and their contribution to the diagnosis of brain tumors. Special emphasis is laid on the latest developments and on potential future applications of MRI. Chap. 3 is regarding the genetic and molecular basis of gliomas. In Chap. 4, we have included a new section about application of f(MRI) and DTI in presurgical planning for tumor resection. Chapters 5–12 constitute an in-depth study of imaging characteristics of different brain tumors on CT and MRI. The images’ contribution to diagnosis and their correspondence to certain pathologic appearances are particularly stressed. Finally, a state-of-the-art chapter on nuclear medicine is included to cover the impact of SPECT and PET imaging on brain tumor diagnosis.

We hope that this book will serve as a teaching tool and practical reference for the diagnosis of brain tumors and will enhance the reader’s diagnostic performance.

I would also like to thank all the distinguished authors for their valuable contribution.

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